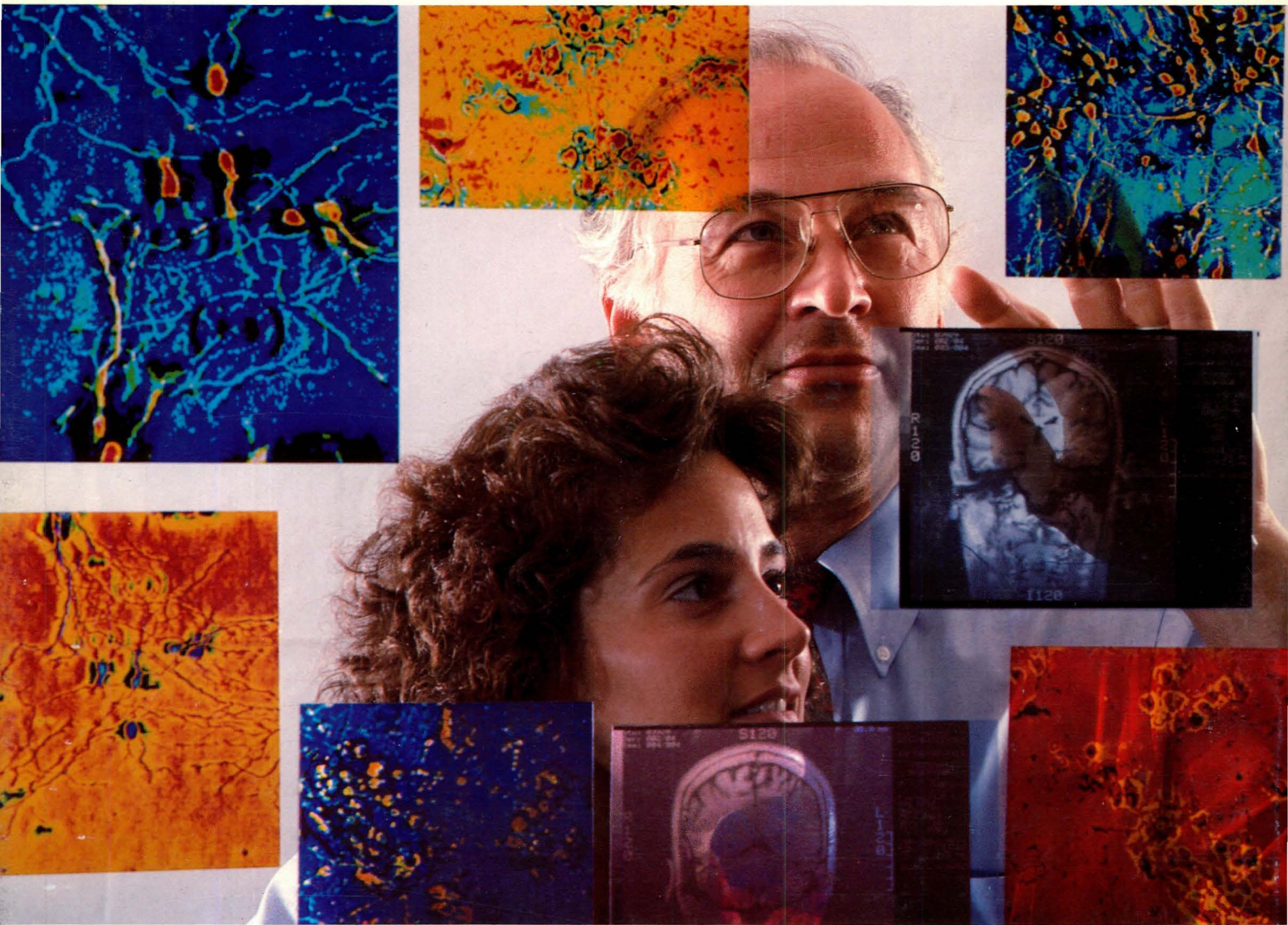


1989-90 GENERAL CATALOGUE



UNIVERSITY
OF CALIFORNIA
IRVINE

Academic Calendar

Please read the *Catalogue* and the quarterly *Schedule of Classes* very carefully for detailed information on enrollment procedures and late service fees. The enrollment process consists of a number of steps in addition to the submission of enrollment materials. Medical students should consult the College of Medicine Office of Admissions for the College of Medicine calendar.

Fall Quarter, 1989

Quarter Begins Sept. 18 (Mon.)
Academic Advising and
Orientation Sept. 18-22 (Mon.-Fri.)
Instruction Begins Sept. 25 (Mon.)
Thanksgiving Holiday Nov. 23-24 (Thurs.-Fri.)
Instruction Ends Dec. 1 (Fri.)
Final Examinations Dec. 4-8 (Mon.-Fri.)
Quarter Ends Dec. 8 (Fri.)
Winter Recess Dec. 25-26 (Mon.-Tues.);
Jan. 1-2 (Mon.-Tues.)

Winter Quarter, 1990

Quarter Begins Jan. 3 (Wed.)
Academic Advising and
Orientation Jan. 3-4 (Wed.-Thurs.)
Instruction Begins Jan. 5 (Fri.)
Martin Luther King, Jr. Holiday Jan. 15 (Mon.)
Presidents' Day Holiday Feb. 19 (Mon.)
Instruction Ends Mar. 16 (Fri.)
Final Examinations Mar. 19-23 (Mon.-Fri.)
Quarter Ends Mar. 23 (Fri.)
Spring Holiday Mar. 26 (Mon.)

Spring Quarter, 1990

Quarter Begins Mar. 28 (Wed.)
Academic Advising and
Orientation Mar. 28-30 (Wed.-Fri.)
Instruction Begins Apr. 2 (Mon.)
Memorial Day Holiday May 28 (Mon.)
Instruction Ends Jun. 8 (Fri.)
Final Examinations Jun. 11-15 (Mon.-Fri.)
Commencement Jun. 16 (Sat.)
Quarter Ends Jun. 16 (Sat.)

Summer Sessions, 1990

Session I Jun. 25-Aug. 1 (Mon.-Wed.)
Session II Aug. 6-Sept. 12 (Mon.-Wed.)

On the cover: UCI students have the opportunity to conduct independent research under the direct supervision of faculty who are nationally and internationally known in their fields, such as Carl W. Cotman, Professor of Biological Sciences, Neurology, and Psychiatry and Human Behavior. Professor Cotman also serves as director of UCI's internationally recognized program in aging and age-related brain disorders and director of the state-funded Alzheimer's Disease Diagnostic and Treatment Center at UCI.

Cover photo by Paul Kennedy.

1989-90 GENERAL CATALOGUE

UNIVERSITY
OF CALIFORNIA
IRVINE

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1989-90 General Catalogue

University of California, Irvine

(USPS-646-660) Volume 23, Number 1, July 1989

The *General Catalogue* is published four times a year by the Publications Office, University of California, Irvine, CA 92717. Second class postage paid at Santa Ana, CA. Price \$4.50. See page 351 for mail orders.

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

The University of California

David Pierpont Gardner **President**

The University of California was chartered as the State's only Land Grant College in 1868. Throughout its first decades, the University's development was strongly influenced by leading educators and scholars from various parts of the country. Supported by the State and many generous benefactors, the University was responsive to the needs of California while progressing on a steady climb toward eminence in academic and scientific achievement.

Today the University system includes nine campuses: Berkeley, Davis, Irvine, Los Angeles, Riverside, San Diego, San Francisco, Santa Barbara, and Santa Cruz. All of the campuses adhere to the same admissions guidelines and high academic standards, yet each one has its own distinct character. Among the campuses there are five medical schools, three law schools, and a school of veterinary medicine, as well as professional schools of business administration, education, engineering, oceanography, and many others. The University's libraries are among the finest in the United States; the collections of the more than 100 University of California libraries on the nine campuses are surpassed in size on the American continent only by the Library of Congress collection.

In just over a century, the University has become one of the world's largest and most renowned centers of higher education. The faculty is internationally noted for its distinguished academic achievements. On its nine campuses, the University has a total of 20 Nobel laureates. National Academy of Science membership on all campuses numbers more than 239, greater than any other college or university system.

The University maintains a variety of research facilities, agricultural field stations, and extension centers in more than 100 locations throughout California. Public services include medical and dental clinics, information services for agricultural and urban populations, and a broad program of continuing education for adults in the arts, business, and professions.

Under contract with the U.S. Department of Energy, the University operates three national research facilities: the Lawrence Berkeley Laboratory adjoining the Berkeley campus; the Lawrence Livermore National Laboratory at Livermore, California; and the Los Alamos National Laboratory at Los Alamos, New Mexico. Other major research facilities include Lick Observatory, White Mountain Research Station for high-altitude research, Laboratory of Radio Astronomy, Bodega Marine Laboratory, Scripps Institution of Oceanography, Institute of Transportation Studies, Statewide Air Pollution Research Center, Space Sciences Laboratory, Hormone Research Center, and Philip L. Boyd Deep Canyon Desert Research Center, among others.

One of the University's unique resources is its roster of University Professors. The University Professor title is reserved for certain distinguished faculty members who are recognized nationally and internationally as scholars and teachers of exceptional ability. A University Professor may visit a number of University of California campuses during the academic year, holding conferences with students and staff and speaking before general public audiences. A list of University Professors may be found on page 347.

University Administration. Under the State Constitution, governance of the University is entrusted to the Board of Regents. The Regents appoint the President of the University, and with the President's advice, appoint the Chancellors, Directors of major laboratories, Provosts, and Deans who

administer the affairs of the individual campuses and other divisions of the University. Authority in academic matters is delegated by The Regents to the Academic Senate, which determines academic policy for the University as a whole.

The Board of Regents includes seven *ex officio* board members, and 20 regular members who are appointed by the Governor for 12-year terms after consultation with an advisory committee. In addition, The Regents appoint a student Regent for a one-year term as a voting Board member with full rights of participation. The chair and vice chair of the Academic Council serve as faculty representatives to the Board and participate fully in all discussions. A constitutional amendment provides that "Regents shall be able persons broadly reflective of the economic, cultural, and social diversity of the State, including ethnic minorities and women." They shall have "full powers of organization and government, subject only to such legislative controls as may be necessary to ensure compliance with the terms of the endowments of the University and the security of its funds."

The President is executive head of the total institution. Each of the nine campuses has a Chancellor as its chief administrative officer. The Chancellor is responsible for the organization and operation of the campus, including academic, student, and business affairs. For the names of University Regents, Officers, and Chancellors, see page 346.

The Academic Senate, consisting of faculty and certain administrative officers, determines the conditions for admission and degrees, subject to the approval of The Regents, authorizes and supervises courses and curricula, and advises the University administration on the important matters of faculty appointments and promotions and budgets.

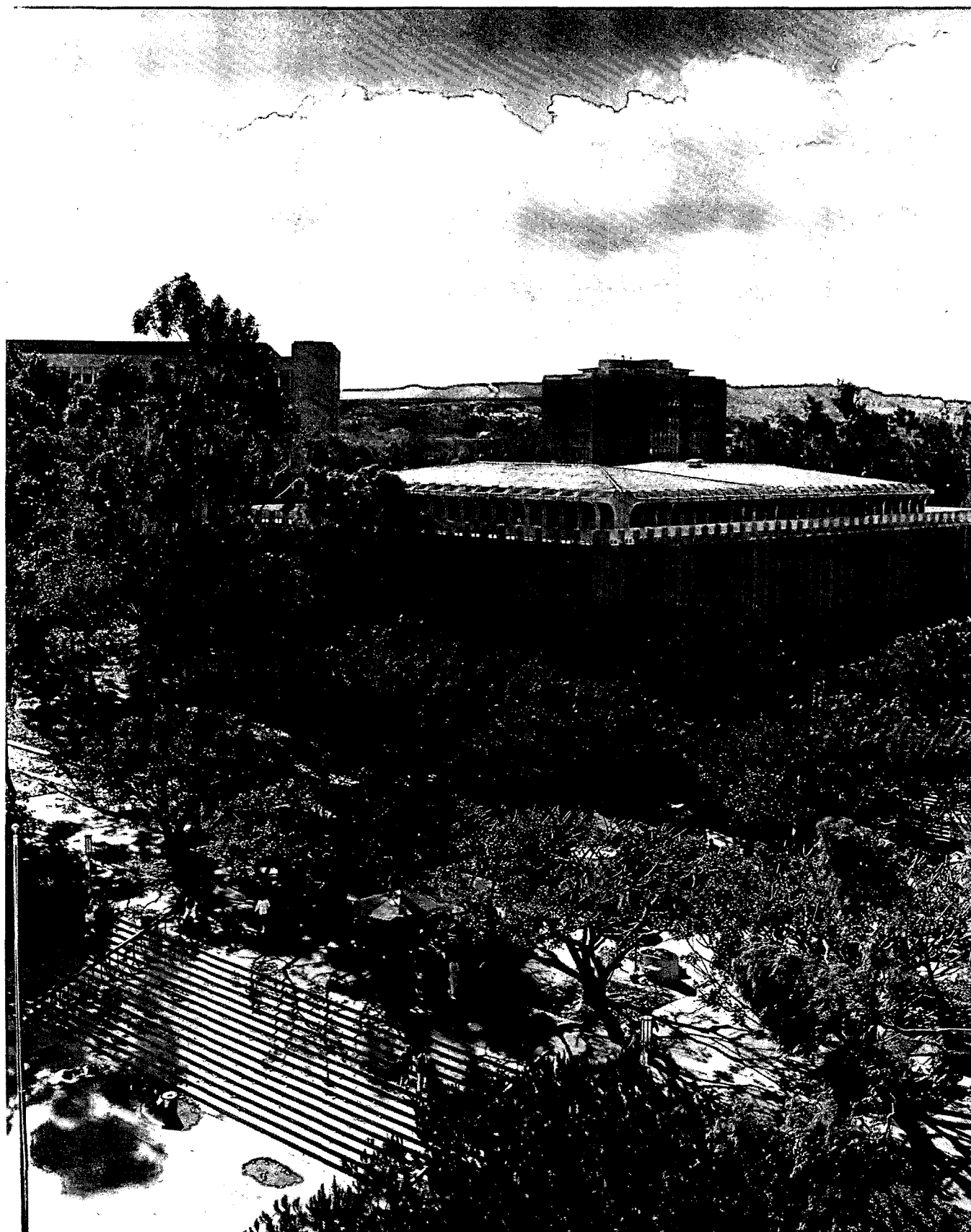
Students participate in policy making at both the campus and Universitywide levels.

The Irvine Campus

Jack W. Peltason **Chancellor**

The University of California, Irvine (UCI) opened in 1965 with 116 faculty and 1,600 students. In its first quarter-century, UCI has attained national and international distinction in its programs and faculty. The campus challenges its students both academically and personally and relies on the commitment, curiosity, imagination, and judgment of its faculty and students to assure its continued intellectual and cultural vitality.

UCI is committed to the pursuit and transmission of knowledge. It makes available to its 15,874 students (13,032 undergraduate, 1,760 graduate, and 1,082 medical students and residents) opportunities for gaining knowledge, training, skills, and credentials which in turn can provide the basis for enhanced social and economic opportunities. With regard to making these opportunities available to all students, UCI takes very seriously its responsibility to establish and implement programs that go beyond legal minimums to ensure that all qualified segments of the public have access and equal opportunity to participate in its academic programs.



UCI lies amid rapidly growing residential communities and a dynamic national and multinational business and industrial complex that affords many employment opportunities. The campus itself also is in the midst of a building boom to accommodate increasing numbers of students, faculty, and research programs.

UCI's education and research missions are fulfilled in its schools, departments, programs, and formal research units. Schools and professional and interdisciplinary units are described briefly below. Formal research unit descriptions are found on page 76.

The School of Biological Sciences is the campus' second largest academic unit, with 3,125 students (2,987 undergraduate and 138 graduate). Faculty research areas include neural plasticity and behavior (which in part encompasses the development of the nervous system, memory, response to injury, and degenerative brain diseases such as Alzheimer's); the nature of cell-cell interactions; pattern formation; the elucidation of ecological conditions and evolutionary histories that have been the driving forces in organism design and functional diversity; the organization and expression of genes; biomolecular structure; molecular pathogenesis; and cell biology.

The School of Engineering focuses on biochemical engineering, earthquake engineering and structural reliability, parallel and distributed computer systems, optoelectronics devices and materials, intelligent systems and neural networks, high-speed image/signal processing, combustion and jet propulsion, and radiative heat transfer. The School has 1,314 students, of which 1,013 are undergraduate and 301 are graduate students.

The School of Fine Arts teaches the creative as well as the academic and critical sides of the arts. It is concerned with the vitality of the arts in society. Faculty energies are directed toward the refinement, enhancement, and encouragement of students' artistic and creative talents and toward the development of the students' understanding of related theory and history. The School offers programs which emphasize extensive studio and workshop experiences, essential theoretical and historical background studies, and exercises in criticism. There are 735 students in the School of Fine Arts, 627 undergraduate and 108 graduate.

Faculty in the Graduate School of Management are involved in studies of organizational behavior, management information systems, finance, marketing, real estate, managerial economics, accounting, decision sciences, operations management, strategy, and health care management. The School has 329 students, and it offers both an undergraduate minor in Management and graduate programs leading to the M.B.A. and the Ph.D. degrees. In addition, in 1985 the School established an Executive M.B.A. Program.

The School of Humanities emphasizes literary theory, Southern history, the philosophy of science, gender studies, and American literature. It houses the Thesaurus Linguae Graecae Project, the unique computerized databank of all existing Greek literature from its Homeric beginnings to about 600 A.D. The School has 1,568 students, including 1,256 undergraduate and 312 graduate students.

The Department of Information and Computer Science (ICS) is dedicated to research and education in the rapidly expanding fields of information management and use, and the technologies that support those fields. A major focus of ICS is the field of computer science, which covers computer system architecture and design, mathematical aspects of computation, software design and development, and artificial intelligence. ICS is a national leader in research into the social and economic aspects of the emerging global information society. The Department has 678 students (581 undergraduate and 97 graduate).

The School of Physical Sciences has a student body of 1,210 (968 undergraduate and 242 graduate). Researchers in the School are conducting investigations in atmospheric chemis-

try (including the discovery of the adverse impact of man-made chlorofluorocarbon compounds on the earth's ozone layer), synthetic chemistry, laser spectroscopy, elementary particle physics (including the discoveries of a new subatomic particle—the neutrino—and a rare subatomic event—the double beta decay), plasma physics, and applied mathematics and mathematical physics.

The Program in Social Ecology, which was established in 1970, is unique to UCI. It is a multidisciplinary unit that focuses on environmental and societal influences on human behavior and health. The Program's central objectives are the application of scientific methods to the analysis and resolution of societal problems and the development of theory and knowledge pertinent to environmental and social phenomena. Research and teaching span the fields of urban planning, urban sociology, ergonomics, public health, human development, environmental and health psychology, demography, criminology, and law. There are 1,155 students participating in the Program (including 1,066 undergraduate and 89 graduate).

The School of Social Sciences, with 3,232 undergraduate students and 144 graduate students, is the largest academic unit at UCI. The faculty's expertise covers a range of specific social science topics, several of which are nationally recognized: the mathematical modeling of perception and cognitive processes; the economic analysis of transportation; the examination of the impact of society's political system on its economy and vice versa; the study of social structure and values in different cultures through a formal-scientific methodology; and the exploration of authority structures and inequality in society.

UCI's Office of Teacher Education, with 263 students, offers nine credential programs for teachers and administrators in California's public elementary and secondary schools. It focuses on teachers' use of computers in high school classrooms, the teaching of writing, and the prevention of abuse of alcohol and other drugs among school children. It has the largest credential program within the University of California system, and it is recognized throughout California for its leadership in the development of innovative programs to improve education in grades K-12.

The UCI College of Medicine has 1,082 students (379 medical, 581 resident-physicians and fellows, and 122 graduate). It offers one of the country's largest residency training programs in primary care and internal medicine and houses some of the most advanced equipment in medical imaging and laser medicine available in the world (including a positron emission tomography scanner and an ultrasound microscope, which is one of only two such machines in the U.S. and the only one used in biomedical research). The College's faculty conduct innovative research in the following areas of emphasis: bioethics, biomolecular structure, oncology, cardiovascular and pulmonary diseases, geriatric medicine, immunology, molecular and human genetics, the neurosciences, and perinatology.

Academic Goals

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

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

UCI provides an atmosphere conducive to creative work and scholarship at all levels, to the exploration of the accumulated knowledge of humanity, and to the development of new knowledge through basic and applied research. Along with these objectives, UCI has a serious commitment to public service. The campus generates research expertise which may be applied to regional and national social issues, and seeks to provide humanistic understanding of the problems of society.

Academic Structure

Instruction and research programs at UCI focus on fundamental areas of knowledge, and at the same time provide for interdisciplinary and professional study. Five basic Schools represent five fundamental areas of knowledge: Biological Sciences, Fine Arts, Humanities, Physical Sciences, and Social Sciences. Programs covering interdisciplinary and professional studies are offered in the Department of Information and Computer Science, the Program in Social Ecology, the School of Engineering, the Graduate School of Management, and the Office of Teacher Education. The UCI College of Medicine provides educational programs for medical and health sciences graduate students, medical residents, and practicing physicians. Programs in physical education, recreation, and intercollegiate athletics are provided by the Department of Athletics and Physical Education.

The Office of Academic Affairs has responsibility for all programs of instruction and research. It, as well as the Office of Research and Graduate Studies and the Office of Undergraduate Studies, report directly to the Executive Vice Chancellor. Matters of educational policy, including approval of programs, courses, and grades, are the responsibility of the Irvine Division of the Academic Senate. The Irvine Division is part of the Academic Senate of the University of California.

The Office of the Vice Chancellor Student Affairs provides students with a range of services and programs designed to create an environment which is supportive of an educational endeavor of the highest quality. Student Affairs programs and services offer students the opportunity to supplement their formal educational experience by becoming involved in diverse aspects of the University including social, cultural, recreational, and leadership opportunities. Such programs and services can broaden the student's University experience by providing opportunities for personal development in addition to intellectual growth. The Office also is responsible for developing a comprehensive community services program that provides opportunities for students to devote time to community services projects.

The Dean of Undergraduate Studies provides leadership in developing policies and programs which serve the academic needs of the undergraduate student population and affect the retention of students, including underrepresented and culturally diverse student populations. Undergraduate Studies provides administrative oversight for undergraduate academically related concerns which require campus-level attention and coordination and which do not come under the direct authority of the heads of academic units or the Irvine Division of the Academic Senate.

The following programs and services are administered by the Office of the Dean of Undergraduate Studies: (1) the Program of Academic Support Services (PASS), which coordinates placement testing, student tracking, the Learning Skills Center, and the Tutorial Assistance Program; (2) the Education Abroad Program; (3) the Student Academic Advancement Services (SAAS) Office, which provides services to targeted populations; (4) the coordination and enhancement of campus academic advising with special responsibility for the advising of unaffiliated students (undeclared majors) and the coordination of the Peer Academic Advising Program; (5) the coordination of the campuswide Honors Program; (6) Instructional Development Services which supports the improvement of teaching and innovation in learning within the UCI community; and (7) the International Opportunities Program (IOP) which helps students to explore the wide range of opportunities available for going abroad.

The Vice Chancellor for Research and Dean of Graduate Studies has general administrative responsibility for graduate education and research. In the area of research, the Vice Chancellor is responsible for research policy development, implementation, and oversight. In graduate education, the Dean of Graduate Studies serves as the academic dean for all graduate students and is responsible for admissions, enrolled student services, graduate student support, and the Graduate and Professional Opportunity Program, which facilitates the involvement of minority students and women in graduate education.

Accreditation

UCI is a member of the Western Association of Schools and Colleges (WASC). The campus is fully accredited by the Senior Commission of WASC. This accreditation requires periodic review in accord with WASC policies and standards. In addition, the undergraduate degree program of the Department of Chemistry is accredited by the American Chemical Society; the undergraduate programs offered by the Civil, Electrical, and Mechanical Engineering Departments are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology; the M.D. program of the UCI College of Medicine is accredited by the Liaison Committee of the Association of American Medical Colleges and the American Medical Association; the Department of Drama is accredited by the National Association of Schools of Theatre; the Graduate School of Management is accredited by the American Association of Colleges and Schools of Business; and the credential programs of the Office of Teacher Education are approved by the Commission on Teacher Credentialing.

Phi Beta Kappa

Phi Beta Kappa, founded in 1776, maintains a chapter at UCI. Phi Beta Kappa is the nation's oldest and most prestigious honor society; it recognizes outstanding scholastic achievement in the liberal arts and sciences. Upper-division students whose undergraduate records fulfill certain requirements are eligible for election to membership. Further information can be obtained from the Office of the Dean of Undergraduate Studies, 256 Administration Building.

Office of Affirmative Action and Equal Opportunity

The UCI Office of Affirmative Action and Equal Opportunity develops and supports programs which promote affirmative action and equal opportunity in University employment, services, and education for qualified minorities, women, handicapped persons, and Vietnam Era U.S. veterans. Additionally, the Office implements systems and procedures designed to facilitate compliance with Titles VI and VII of the 1964 Civil Rights Act and Title IX of the Educational Amendments to the Act.

The Office is responsible for assuring fair and equal treatment in University admissions policies, educational programs and activities, and in both undergraduate and graduate student affirmative action programs. The Office also assists in the coordination of student affirmative action plans. The Office is located in 524 Administration Building; telephone (714) 856-5594.

Office of the Assistant Vice Chancellor University Ombudsman

The Assistant Vice Chancellor University Ombudsman is available to assist students, faculty, staff, and visitors to the University with problems or concerns they may encounter while at UCI. Problems related to student conduct and discipline however, are under the jurisdiction of the Office of the Dean of Students (see p. 349). The Assistant Vice Chancellor University Ombudsman responds to concerns presented by campus individuals and group members by clarifying issues or concerns; making appropriate on- and off-campus referrals for student, faculty, and staff members; and providing a confidential, impartial, and informal setting for grievance and problem resolution. The Office of the Assistant Vice Chancellor University Ombudsman is located in 255 Administration Building; telephone (714) 856-7256.

The Campus Setting

UCI's location offers the cultural and economic resources of an urban area along with access to the scenic, recreational areas of Southern California. Located 40 miles south of Los Angeles, five miles from the Pacific Ocean, and nestled in 1,510 acres of coastal foothills near Newport Beach, UCI lies amid rapidly growing residential communities and a dynamic national and multinational business and industrial complex that affords many employment opportunities. Even so, the campus remains an oasis of green—a natural arboretum planted with trees and shrubs from all over the world. Adjacent to the campus lies the San Joaquin Freshwater Marsh Reserve, part of the University's land preserve system and home to a wide variety of migratory and nonmigratory water fowl and other wildlife.

The UCI Medical Center, located in the City of Orange on a 33-acre site, is a major teaching hospital for the UCI College of Medicine.

UCI is adjacent to University Town Center, a commercial center which is linked to the campus by a pedestrian bridge. Town Center facilities include a movie theatre complex, restaurants, apartments, a post office, a video/record store, a stereo store, a one-hour photographic service, a copy service, clothing stores, an art gallery, a dispensing optician, gift shops, various types of eating places, and a comedy nightclub. In addition, the Town Center is anchored by a 10-story office building which houses private business enterprises as well as several University administrative offices.

Within a few miles of the campus are major department stores; branches of world-renowned boutiques; dozens of

outstanding restaurants, many offering cuisines from a variety of other countries; and major hotels. Cultural opportunities include repertory theatres, orchestras, choral groups, dance companies, galleries, and museums. The John Wayne Airport is two miles from campus.

Yet, in part, the Irvine area retains some of its traditional character as a beach resort. The Portuguese dory fishing fleet at Newport, one of the last private fleets on the West Coast, comes ashore every morning and evening to sell the day's catch, and the sun and surf crowd mingle with the art and artisan crowd at Laguna Beach during the summer and winter festivals.

The temperate, Mediterranean climate stimulates year-round water-oriented activities such as windsurfing, sailing, and tidepooling. The spring, summer, fall, and winter find students, many of whom live in the nearby beach communities of Balboa Island, Balboa Peninsula, and Newport Beach—enjoying the warm sun and gentle sea breezes. Boating enthusiasts set sail in Newport Bay in 14- or 30-foot sailboats or in canoes, available from the UCI Sailing Club. Access to large, offshore racing boats also is occasionally available from the Sailing Club. Local mountain and desert recreation areas are within easy reach, and the UCI Cooperative Outdoor Program provides low-cost rental equipment for hiking and skiing, and instruction for other recreational pursuits. The metropolitan attractions of Los Angeles and San Diego are approximately an hour's drive from the campus.

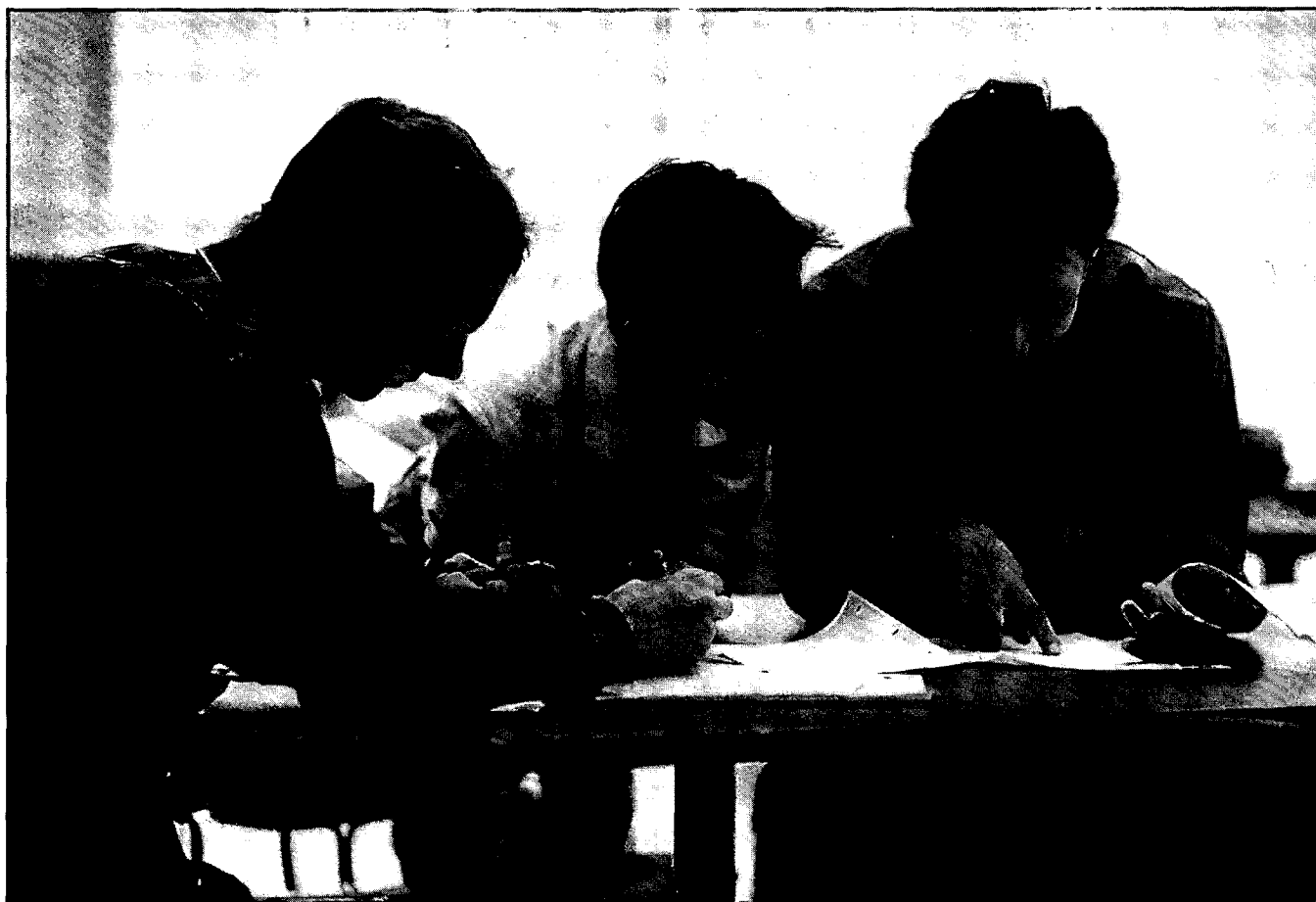
Bus transportation between the campus and major housing areas, shopping centers, and beaches is convenient, and bicycling is popular. Both the campus and the surrounding communities are designed to encourage bicycle traffic, and trails connect UCI to many student housing areas and to the waterfront areas of Newport Beach.

Instructional and Research Facilities

University Library

Calvin J. Boyer **University Librarian**

The UCI Library is a component of the extensive University of California Library system, whose libraries contain more than 20 million volumes. These libraries are committed to a resource-sharing plan which strengthens the resource base and usefulness of UCI's own library system. Established in 1963, the UCI Library collection has been carefully selected and developed in conjunction with the campus academic plan. The UCI Library system includes the Main Library, the Physical Sciences Library, the Biomedical Library, the Biological Sciences Library, and the Medical Center Library. This important resource for study, teaching, and research contains more than 1,300,000 volumes, including more than 20,000 currently active serials subscriptions. Except for those materials which comprise the Medical Center Branch Library, all of these volumes are housed on the general campus. In addition, a student may request books from other University of California libraries and from other libraries throughout the world.



The UCI Library system houses more than 1,300,000 volumes and includes the Main Library, Physical Sciences Library, Biomedical Library, Biological Sciences Library, and the UCI Medical Center Library.

With the exception of materials housed in special units, all periodicals and books are on open shelves and easily accessible to all readers. The following Library departments provide specialized services to the users of the Main Library.

The Reference Department maintains an open-shelf collection of approximately 22,000 volumes. Librarians in the Reference Department assist in the use of reference materials and provide information on a wide variety of topics to campus and community users. The Department has numerous guides and handouts available to assist users in both general and specialized library research. In addition to offering a formal course in library research techniques (Humanities 75: Library Research Methods), the Department provides course-related instruction and general orientations to the Library and makes available individual research consultations with appropriate subject specialists. The Department also offers the fee-based Computer-Assisted Reference Service (CARS).

The Government Publications and Microforms Department contains government publications and microforms for the Library. The Government Publications Collection contains more than 400,000 publications issued by the U.S. government, the State of California, international organizations, and Canada. This department also contains the Orange County Public Affairs Collection, a resource of current information on local topics issued by both governmental and nongovernmental agencies. Computer-assisted reference service (CARS) is available on a fee-for-service basis. The micro-

forms collection contains more than one million pieces, including newspapers, periodicals, journals, books, U.S. and foreign government publications, college catalogues, telephone books, the Educational Resources Information Center (ERIC) collection, and various other reports and papers. Machines for reading and copying microform material are available.

The Department of Special Collections contains noncirculating holdings of rare books and early printed works, noteworthy or finely printed editions, exceptionally costly or fragile items, and manuscripts. Special subject collections include French literature of the seventeenth and eighteenth centuries, the René Wellek collection of the history of criticism, the Hans Waldmüller Thomas Mann collection, California history and literature, British naval history, contemporary poetry, dance, historical costume, political pamphlet literature, and the Emma D. Menninger collection in horticulture.

The University Archives, which shares quarters with the Department of Special Collections, is the official repository for records having permanent value in documenting the history of the UCI campus. These records include publications, manuscripts, photographs, and other records of administrative and academic units, student organizations, and campus support groups.

The Library Media Center provides nonprint materials that support campus academic programs. Music, art, literature, and the sciences are represented in the Center's collection of

audio- and videocassettes, films, and computer software. The Center provides a playback area for immediate use of the materials and a microcomputer lab for computer software. An audio-cassette duplication service for public domain tapes also is available.

The Serials Department includes the Current Periodicals Room in which current newspapers and periodical issues are available for in-room use.

The Main Library Copy Service provides attended copiers and typewriters for direct patron use and also provides many media and microcomputer supplies. The services are available at most times the Library is open. Coin-operated copiers and change machines are available at all times throughout the Library.

Other Main Library facilities include individual and group study seating and a room containing study aids for blind and partially sighted students. When the University is in session the Main Library is open 102 hours per week.

The Reserve Service circulates required or collateral reading materials that have been selected by the faculty for students. Reserve materials circulate for very limited time periods.

The Physical Sciences Library is located in the Physical Sciences Building, and contains more than 75,000 volumes on mathematics, physics, astronomy, and chemistry. The collection includes approximately 1,200 serial titles. Hours of service are the same as those in the Main Library; computer-assisted reference services (CARS), copying services, and bibliographic instruction are available.

The Biomedical Library is located in the College of Medicine complex and contains a collection of some 146,000 volumes of medical and biological literature, with subscriptions to more than 2,500 serial titles. Among the audiovisual services provided are microfiche readers, video tape players, and slide projectors with tape players. The Biological Sciences branch of the Biomedical Library is located in the Science Lecture Hall and houses subscriptions to approximately 1,200 current serial titles.

The Medical Center Library is located at the University of California Irvine Medical Center in Orange. Its collection includes approximately 39,000 volumes and more than 1,000 clinical serial subscriptions. This library serves the information needs of the Medical Center and supports the teaching activities of the College of Medicine.

Modern methods for increasing the speed and efficiency of library service are in use throughout the UCI Library system. The Library subscribes to a computer-based cataloging service that enables it to make books available rapidly. Circulation in all libraries is computerized. Computer-assisted reference services (CARS) provide access to a variety of machine-readable bibliographic and numeric databases. The MELVYL online catalog provides users with quick and creative ways to locate books and journals held at UCI and at any other library in the University of California system. Information about CARS and the MELVYL catalog may be obtained at the reference desks in all libraries.

Interlibrary loan service is available on a national and international basis to all University of California faculty, students, and staff. Shuttle bus service to UCLA is offered Monday through Saturday during the regular school year and Monday through Friday during the summer sessions for UCI faculty, students, and staff to use the UCLA libraries. Reservations and information may be obtained by contacting the Main Library Administration Office.

Office of Academic Computing

The Office of Academic Computing is responsible for the management of two departments: Computing Facility and Network and Telecommunications Services. The Office of Academic Computing is located in 360 Computer Science Building; telephone (714) 856-6540. It is open weekdays from 8 a.m. to 5 p.m.

Computing Facility

The UCI Computing Facility provides instructional and research computing services for faculty, students, and staff. Its mission is to support and enhance the use of computing technology throughout the campus.

Computing Facility services are provided on a multiprocessor Sequent Symmetry S81 running the UNIX operating system; a Digital VAXcluster consisting of a VAX 6210, an 11/785, an 11/780, and an 8350 running VMS; a DECsystem 20 supporting the TOPS-10 operating system; Sun Microsystems workstations; and personal computers from IBM, AT&T, and Apple. Software offerings include a wide variety of applications packages used in statistics, graphics, text formatting, test scoring, financial modeling, computer-assisted design (CAD/CAM), and database management. An advanced electronic mail system and packages for micro-to-host communications also are available.

Programming languages available include Pascal, FORTRAN, APL, BASIC, C, LISP, and COBOL. In addition, high-quality graphics and alphanumeric output devices including laser printers and pen-and-ink plotters are available.

Professional staff provide consulting services on the use of Facility computers and software, as well as specialized consulting in the areas of statistics, microcomputing, research computing, computer system management, and administrative applications. Student consultants are available in the public terminal room while classes are in session.

The Computing Facility offers a variety of nonacademic computer workshops for students, faculty, and staff. The workshops cover such topics as the use of specific computers and computer packages, general computer awareness, and the selection and use of microcomputers. (Note: Academic courses in computing are offered by the Department of Information and Computer Science, other academic units, and University Extension.) The Computing Facility also provides computer system management, computer operations, and consulting for both the Facility's systems and those owned by other units.

The Computing Facility is located in the Computer Science Building. It is open 24 hours a day, seven days a week. Consulting and administrative offices are open weekdays from 8 a.m. to 5 p.m. The public terminal room, located in 308 Computer Science Building, provides access to nearly 100 terminals connected to the campus high-speed fiber optic backbone network.

Further information is available in the Computing Facility Consulting Office, 346 Computer Science Building; telephone (714) 856-6116.

Network and Telecommunications Services

Network and Telecommunications Services is responsible for operation and maintenance of UCInet, the campuswide network used for access and communication with computers located at the Computing Facility and other sites on campus. Network and Telecommunications Services also is responsible for the operation and maintenance of the campus telephone system, which provides Voice Mail, data transmission, and other services. Additional services include an equipment repair facility which supports IBM personal computers, Apple Macintoshes, Sun workstations, and other computer equipment.

UCInet provides access to regional, national, and international research and education networks and computing services, including NSFnet, CERFnet, and BITnet, as well as to the national supercomputer centers. UCInet is based on a fiber optic cable system which extends into the campus buildings. This cable system is used to implement a TCP/IP high-speed "backbone" interconnecting local area networks in various schools and departments. UCInet's backbone also is connected to MELVYL, the University of California online library catalog system, and the Medline research database.

The Network and Telecommunications Services office is located in 2209 Central Plant Building; telephone (714) 856-5123. It is open weekdays from 8 a.m. to 5 p.m.

Research

The University of California, Irvine is among the leading research universities in the United States. In 1987-88 UCI received more than \$61 million from federal and state agencies and private organizations for the support of basic and applied research and for other scholarly activity. Research is an integral part of all schools and departments, and many of UCI's research programs have achieved national and international distinction for their work.

The research programs at UCI have a positive impact on both undergraduate and graduate education. Research is critical to graduate education because of the research-oriented nature of doctoral study. At the undergraduate level, research at UCI provides undergraduate students with access to a faculty made up of researchers at the forefront of their fields. As a consequence, the knowledge received by UCI students is the latest and most up-to-date available. The Research and Graduate Studies section (see p. 76) describes organized research activities, organizations, and resources.

Natural Reserves System

The University of California manages and maintains a system of 26 land and water reserves that are representative of the State's habitat and geographic diversity. These serve as outdoor laboratories for students, faculty, and staff, and are intended primarily for purposes of education and research. The reserves are administered by local campus management committees who control their uses. The Irvine campus is responsible for two reserves: the San Joaquin Freshwater Marsh Reserve and the Burns Piñon Ridge Reserve. Additional information is available from the Department of Ecology and Evolutionary Biology, School of Biological Sciences, University of California, Irvine; Irvine, California 92717; telephone (714) 856-6006.

San Joaquin Freshwater Marsh Reserve

The San Joaquin Freshwater Marsh Reserve, one of the last remaining freshwater marshes of Southern California, is a 202-acre reserve adjacent to the Irvine campus. The Marsh consists of a series of freshwater ponds and their attendant aquatic flora and fauna, and is especially known for its rich

bird life, both resident and migratory. Researchers and observers have recorded more than 200 species of birds in the Reserve, a major stopping point on the Pacific Flyway. Periodic tours are conducted. Additional information is available from the Museum of Systematic Biology, University of California, Irvine, Irvine, California 92717; telephone (714) 856-6031 or 856-6006.

Burns Piñon Ridge Reserve

The Burns Piñon Ridge Reserve is located near the town of Yucca Valley in San Bernardino County. It is a 265-acre parcel of high-desert habitat representing an ecotone between montane and desert biota, with mixtures of Joshua tree, piñon pine, and juniper woodland. The Reserve has primitive camping facilities and is used primarily for overnight field trips and research by faculty and students from the School of Biological Sciences. Additional information is available from the Department of Ecology and Evolutionary Biology, School of Biological Sciences, University of California, Irvine; Irvine, California 92717; telephone (714) 856-6006 or 856-6031.

Irvine Ecological Preserve

The 102-acre Irvine Ecological Preserve consists of several small hills and surrounding flatlands bearing remnants of coastal sage scrub flora and associated fauna. The Preserve is located on the campus and is set aside for use by the campus community. Additional information is available from the Department of Ecology and Evolutionary Biology, School of Biological Sciences, University of California, Irvine; Irvine, California 92717; telephone (714) 856-6006.

UCI Arboretum

The UCI Arboretum is a botanical garden developed and managed by the School of Biological Sciences. It contains areas planted with floras adapted to climates similar to those of Southern California. The Arboretum maintains a gene bank devoted to the conservation of African monocot floras and contains several important collections of rare plants. Certain research and instructional materials are grown. The Arboretum collections are also used as an educational resource for the community at large. Volunteers and other interested parties are encouraged to participate in Arboretum activities. Additional information is available from the Arboretum Office; telephone (714) 856-5833.

Museum of Systematic Biology

The Museum of Systematic Biology is a scientific resource charged with cataloging and maintaining specimens of local plants and animals. Its holdings, totaling more than 145,000 specimens, provide environmental scientists and students of ecology with information about the occurrence, identification, and distribution of the species living in Orange County in particular and Southern California in general. In addition to its general holdings, the Museum is custodian for four outstanding special collections: the Sprague Conchological Collection, the Cassady-Lewis Herpetological Collection, and the Theodore Hower and Charles Rudkin Lepidoptera Collections. Additional information is available from the Museum; telephone (714) 856-7420.

Laser Microbeam Program

The Laser Microbeam Program (LAMP) was established on the Irvine campus in 1979 as a national facility in the area of laser microbeam biotechnology. LAMP functions as a research, training, and service facility, and provides interaction between the laser industry and the academic biomedical research community. The facility serves as a resource to promote research in cell biology, developmental biology, neurobiology, genetics, oncology, and clinical medicine. Microsurgery is performed at subcellular, cellular, and tissue levels. The program is conducted in the Beckman Laser Institute and Medical Clinic and is funded through a grant from the Biotechnology Resources Program of the National Institutes of Health. Additional information is available from the LAMP office; telephone (714) 856-6996.

Thesaurus Linguae Graecae Project

Financed through private and federal funds, the Thesaurus Linguae Graecae (TLG) Project began in 1972. Project goals are to create the *Thesaurus Linguae Graecae*, a data bank of Greek literature from its Homeric beginnings to the end of the Byzantine era (approximately A.D. 600); to conduct literary research using collected texts; and to apply technological innovation in these endeavors. TLG research activities combine the traditional concerns and methodologies of philological and literary study with the most advanced features of computer technology. Included among current research foci are the identification of ancient Greek literary and documentary materials from various literary-historical periods; the conversion of these materials into machine-readable form; the enhancement of automated text-verification routines; and the examination of criteria for data-capture of "non-standard" source materials such as nonliterary (e.g., documentary) texts. TLG staff are establishing procedures to facilitate nationwide access to data-bank resources at UCI. The data bank currently contains more than 60 million words of Greek text.

The Project's close ties with the Department of Classics are evidenced by faculty participation in TLG research and TLG support of graduate students. In addition, TLG's library holdings enhance those of the University Library, and TLG-related conferences and scholarly visits afford faculty and students contacts with eminent classicists. The Project has made UCI a major source of classics research activity.

UCI Medical Center and Community Clinics

The UCI Medical Center (UCIMC) is one of five teaching hospitals owned and operated by the University of California. It is located on a 33-acre site in the City of Orange, 13 miles from the UCI campus. UCI College of Medicine faculty and resident physicians are the professional staff for medical services at the Center. UCIMC maintains inpatient and outpatient services in virtually all medical specialties and is fully accredited by the Joint Commission on Accreditation of Hospitals. The Medical Center is the only designated County Level I tertiary trauma referral center.

The Center serves as the principal clinical facility for teaching and research programs for the College of Medicine. Licensed for 493 beds, the Medical Center currently serves 18,900 inpatient admissions, 197,000 outpatient visits, and 40,000 adult and pediatric emergency visits.

The availability of advanced technology and the nationally recognized expertise of members of the staff have made UCI Medical Center a regional referral center for the diagnosis and treatment of many medical problems. UCIMC is nationally recognized for its burn center and expertise in the

surgical replantation of severed limbs. In addition, the Medical Center offers special programs for high-risk pregnant women and critically ill newborns. The 24-hour Regional Poison Center provides services not available at other hospitals in Orange County. Other services include multidisciplinary cardiology and oncology programs and a comprehensive psychiatry program for adults, adolescents, and children.

Basic research in neurobiology combined with clinical expertise in neurology and neurosurgery are placing College of Medicine faculty in the forefront in the understanding and treatment of many neurological disorders, including epilepsy, cerebral palsy, and Alzheimer's disease. UCIMC also is one of the primary centers for the comprehensive management of diabetes. In addition, the Medical Center has received federal approval for the use of lasers in the treatment of cancers of the head, neck, and female reproductive system, and for cardiovascular disease. Programs in research and patient care using laser technology are coordinated by the Beckman Laser Institute and Medical Clinic, located on the UCI campus.

A major redevelopment program is continuing and is designed to enhance the professional facilities and environmental setting of the Medical Center. The most recently completed areas include new intensive care units for medical, surgical, and cardiac patients, and the Medical Center lobby and gift shop. A comprehensive health care center designed especially for women has been opened. Basic and clinical research will be an integral component of the Cancer Center, scheduled to open in the spring of 1990. Plans for further Medical Center expansion include the construction of a new psychiatric hospital. In addition, construction of phase two of the UCI Medical Pavilion will allow increased patient care services by faculty members. The Pavilion, which opened in July 1988, houses multispecialty care facilities. In addition, it is the interim site for the Cancer Center until construction is completed on a new regional outpatient facility in 1990.

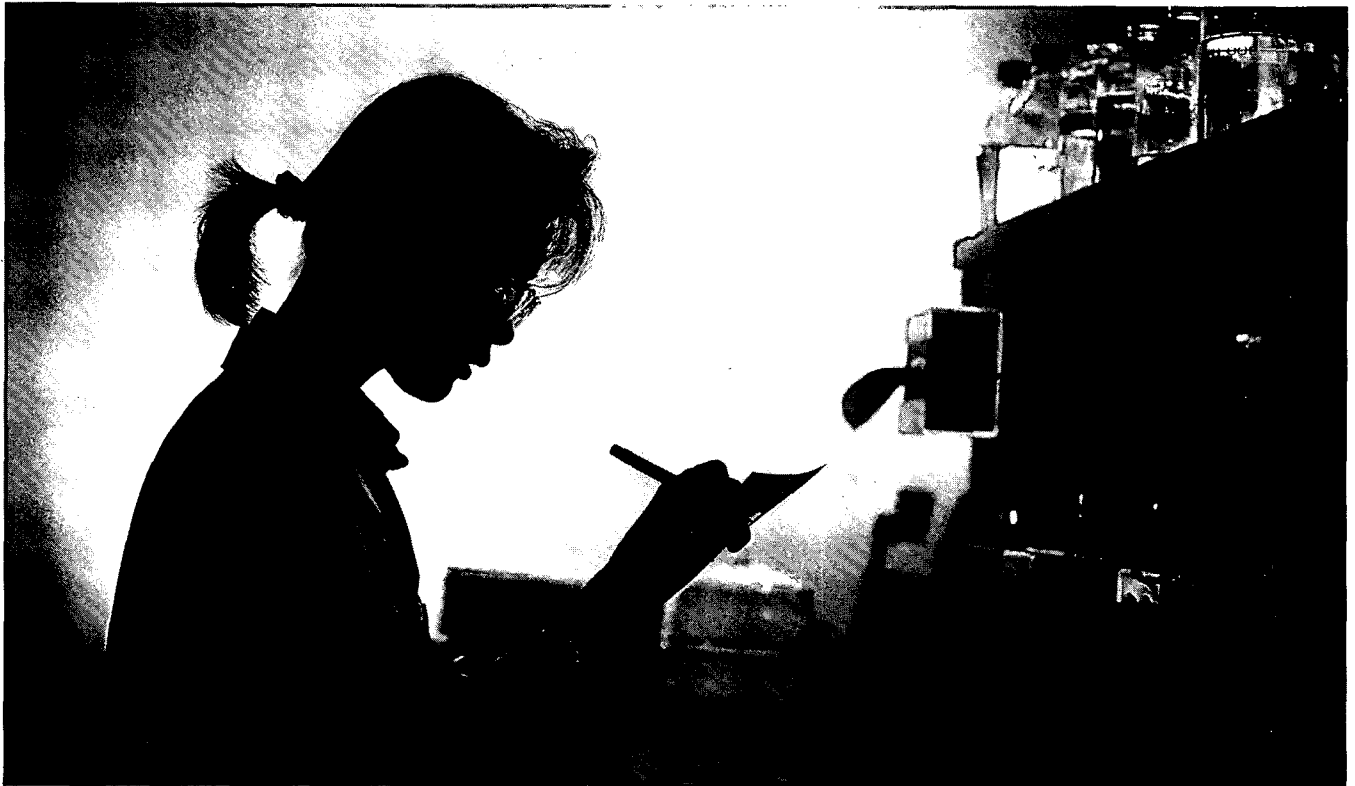
UCI clinical facilities also include the Community Clinic of Orange County (CCOC) in Santa Ana and the North Orange County Community Clinic (NOCCC) in Anaheim. Both clinics provide educational experiences and patient services in primary care.

Important components of UCI's medical education and research programs are also conducted at affiliated hospitals and clinics, in particular, the Veterans Administration Medical Center and Memorial Medical Center, both of Long Beach.

Further information about University-operated clinical facilities and other facilities associated with the UCI Clinical Services System is found in the College of Medicine section.

Southern Occupational Health Center

In 1980 the University established occupational health centers in Northern and Southern California. The purposes of these Centers are (1) to train occupational health professionals, (2) to conduct research on occupational health issues, (3) to provide clinical evaluation of the worker/patient for work-related disease, and (4) to be linked to a hazardous



The UCI Medical Center serves as the principal clinical facility for teaching and research programs for the College of Medicine and maintains inpatient and outpatient services in virtually all medical specialties.

chemicals alert system. The Centers also have strong ties to the University's Schools of Medicine and Public Health.

The Southern Occupational Health Center (SOHC) is comprised of health professionals from the University's Irvine and Los Angeles campuses. Faculty research is concerned with identification of causal association between disease and occupational exposure as a basis for prevention of occupational disease and injury. The Irvine campus has primary responsibilities in occupational medicine and toxicology. The Los Angeles campus has primary responsibilities in industrial hygiene, occupational epidemiology, occupational health education, and occupational health nursing.

The SOHC houses a referral clinic; faculty and staff offices; analytic chemistry laboratories; and facilities for research and teaching in industrial hygiene and work physiology. There is also classroom, library, and study space for residents in occupational medicine and other graduate students. For further information, please telephone the Center at (714) 856-8640.

Office of University Advancement

University Advancement, (714) 856-7324, is the primary office responsible for coordinating campus-community relations. Its purpose is to increase public awareness, understanding, and support of the University's teaching, research, and public service programs and to develop a strong program of private support for the University. University Advancement activities include development, community relations, alumni relations, communications, public information, and publications.

University Advancement, working closely with The UCI Foundation and the College of Medicine Foundation, plans and administers a coordinated institutional advancement program which encourages private contributions from individuals, corporations, and foundations. Inquiries regarding gifts

and bequests should be directed to The UCI Foundation, (714) 856-6245, and the College of Medicine Foundation, (714) 856-7252. The principal community support group is the UCI Chancellor's Club. This organization of community leaders provides important unrestricted, private financial assistance to the campus. The UCI Alumni Association, (714) 856-7361, was founded in 1968 and is a separately incorporated nonprofit organization which provides assistance to the campus, including, for example, student financial aid and emergency loans, career planning assistance to students, and formal recognition of the outstanding research and creative achievements of undergraduate and graduate students. Other organizations under the umbrella of The UCI Foundation are the Daniel G. Aldrich Jr. Society, Chief Executive Roundtable, Business and Industrial Associates, Friends of the Library, Faculty Associates, Humanities Associates, Sports Associates, Town and Gown, and the Theatre Guild. Additional organizations under the College of Medicine Foundation are the Associated Alumni of the UCI College of Medicine, Medical Faculty Wives, Medical Center Auxiliary, and the Medical Research and Education Society.

University Advancement also is responsible for informing the public about the University's achievements, academic accomplishments, events, and programs. It implements and coordinates a sustained informational effort through various channels of communication, including the public media.

On behalf of the campus and in cooperation with the UCI Alumni Association, University Advancement publishes the bimonthly *UCI Journal*, a tabloid for distribution to alumni and other University supporters and interested members of the general public. It also publishes *UCI Items*, a campus newsletter and calendar for faculty, students, and staff.

Contact with UCI

Telephone Guide

Information about UCI programs, services, and activities is available at the following offices. Other campus numbers may be found in a local telephone directory or reached through the campus operator at (714) 856-5011, Monday through Friday, 8:00 a.m. to 5:00 p.m.

Office	Telephone (714)
Admissions	
Undergraduate	
General Information	856-6703
Counselor or Evaluator	856-6705
Graduate	856-6761
Medical	856-5388
Academic Advisors	see p. 50
Alumni	
UCI Alumni Association	856-7361
Associated Alumni	
UCI College of Medicine	634-0152
Arts and Lectures Information	856-6379
ASUCI	856-5547
Bren Events Center Ticket Office	856-5000
Campus Tours	856-5832
Computrends	856-4266
Dean of Students	856-5590
Development and Affiliates	856-6424
Disabled Student Services	856-7494
Educational Opportunity Program	856-5410
Financial Aid	856-6261
Fine Arts Box Office	856-6617
International and Nontraditional Services	856-7249
New Student Information	856-6345
Off-Campus Student Services	
Community Housing	856-7248
Commuter Student Programs	856-7247
Ombudsman	856-7256
On-Campus Housing	856-6811
Public Information	856-6922
Reentry Student Services	856-5518
Registrar's Office	856-6124
Relations with Schools and Colleges	856-5518
Sports Information	856-5814
Student Health	856-5301
Student Speakers Forum	856-5588
Summer Sessions	856-5493
Transfer Student Services Office	786-7821
UCI Medical Center	634-6011
University Bookstore	856-7411
University Extension	856-5414
University Speakers Bureau	856-5588
Veterans Student Services	856-6477
Vice Chancellor Student Affairs	856-7253

Admissions Information

Admissions information and counseling are available from three separate offices. Each office is open from 8 a.m. to 5 p.m. weekdays throughout the year, except for holidays. Please refer to pertinent sections on Undergraduate Admissions, Research and Graduate Studies, and the UCI College of Medicine.

Undergraduate Admissions: Admissions counselors are available by telephone and in person to answer a variety of questions from potential students and their parents, and they also can refer callers to specific academic units for further information. The telephone guide lists specific numbers to call for an appointment.

Graduate Admissions: The Dean of Graduate Studies is responsible for admission of graduate students. Information about graduate study at UCI and application forms are available from individual graduate programs or the Office of Research and Graduate Studies, 145 Administration Building.

Housing Information

Facilities exist on campus for housing undergraduate and graduate students and include residence halls, a recreational vehicle park, and apartments. For more detailed information, please see "Housing" under Campus and Student Services, page 72. Students interested in living off campus may contact the Community Housing Office, telephone (714) 856-7248, for information about various housing opportunities in the Irvine area, roommates, and general rental prices.

Office of Relations with Schools and Colleges

The mission of the Office of Relations with Schools and Colleges (ORSC) is to stimulate and advance cooperative educational relationships between UCI and California schools and colleges. ORSC works to improve the preparation of prospective students for higher education, and to promote their access to and success at UCI.

Interinstitutional Relations. ORSC staff are involved in: (1) programs to enhance the professional development of educators in grades K-12; (2) intersegmental activities and programs for school improvement; (3) various educational organizations designed to facilitate regional cooperation; and (4) secondary school accreditation reviews through the Western Association of Schools and Colleges.

Outreach Services. ORSC staff (1) advise prospective students, their parents, teachers, counselors, and school administrators regarding academic programs and admission and major requirements, and assist them with UC application and enrollment processes; (2) increase public awareness of UCI by making presentations to schools, colleges, and the community regarding UCI and the University of California, and by creating publications which explain admissions policies and procedures, academic options, housing, financial aid, and student life opportunities; (3) provide general information on UC admissions and programs for all UC campuses; (4) interpret University policies and procedures specific to undergraduate enrollment; (5) gather information about educational developments in the schools; (6) assist prospective transfer students and community college faculty and staff through the Transfer Student Services Office; (7) sponsor an undergraduate reentry program for nontraditional students that provides assistance to adults returning to or first experiencing higher education after an extended break in their education; (8) participate in activities and projects designed to increase the enrollment and enhance the academic success of students from groups currently underrepresented at the University; and (9) provide academic and admissions information to distant areas through alumni representatives in conjunction with the Alumni Office.

On-Campus Services. ORSC staff (1) promote liaison and curricular articulation between UCI and the 106 California community colleges; (2) offer student-led campus tours; (3) host programs for prospective students and educational groups including "UCI Senior Day" (fall) for high school

seniors and "High School Day" (spring) for high school freshmen through juniors; (4) administer honors outreach and instructional programs for high-achieving prospective UCI students via UCI Academic Talent Search (grades 9-12), UCI Pre-College (summer), and Honors Day (spring); (5) inform UC and UCI administrators and faculty of developments in California schools and community colleges; and (6) provide consultative services to campus departments wishing to provide special programs for schools and colleges or special recruitment for specific majors or programs.

Additional information about ORSC services is available from the office; telephone (714) 856-5518.

Transfer Student Services Office

The Transfer Student Services Office (TSSO), a component of ORSC, provides advice and guidance to prospective UCI transfer students and serves as a referral base for newly enrolled transfer students with questions, problems, or concerns. Prospective transfer students are encouraged to meet with TSSO staff to learn about UCI admission requirements, application procedures, preparation for UCI academic programs, and information on various campus services and support programs. Appointments are suggested. Additional information is available from TSSO; telephone (714) 856-7821.

Reentry Student Services

Reentry Student Services, a component of ORSC, serves prospective students who are 25 years or older, have experienced a significant break in their education, and/or students who wish to consider higher education for the first time. Services include preadmission counseling, academic advisement, and referrals to appropriate support services. Additional information is available from ORSC; telephone (714) 856-5518.

Educational Opportunity Program/ Student Affirmative Action-Outreach

The Educational Opportunity Program/Student Affirmative Action-Outreach (EOP/SAA) Office serves as a liaison between the University and other educational institutions, providing relevant information regarding EOP, SAA, and UCI's academic programs to prospective students, as well as teachers, parents, and counselors. The primary purpose of EOP/SAA is to enhance the academic preparation and to increase the enrollment of regularly admissible, low-income and/or underrepresented students within the University. The Office also administers the EOP Special Action admissions process for students who may not meet the traditional admission criteria but who demonstrate potential to succeed academically. The Office staff is responsible for carrying out a visitation program to selected secondary schools and community colleges to interpret policies regarding admissions, financial aid, housing, and other appropriate areas. Further information may be found in the Student Affirmative Action section.

Campus Tours

Student-led tours of the campus are conducted weekdays at noon year round; Saturday tours are offered during the fall and spring. The Campus Tours Coordinator in the Office of Relations with Schools and Colleges, telephone (714) 856-5832, can provide further information or set up a special tour.

A video tour of the campus also is available from the Media Center in the Main Library, Room 156 during regular business hours.

Celebrate UCI

Each spring, UCI hosts an open house—"Celebrate UCI"—for everyone interested in learning more about the campus. Among the day's events are the Wayzgoose Medieval Fair, UCI Medical Plaza and College of Medicine Health Fair, and a variety of special programs for prospective students and their parents. Other features of the day include music, food and game booths, jugglers, and mimes, as well as tours, lectures, and presentations. Information on admissions, housing, and financial aid, guided tram tours of the campus, and natural history tours of the San Joaquin Freshwater Marsh also are available.

University Program for High School Scholars

The University Program for High School Scholars (UPHSS) is an opportunity for selected highly prepared and gifted high school students (primarily seniors) to utilize UCI's nationally acknowledged academic resources while still in high school. Participants enroll concurrently at UCI and participate in campus activities, interacting with faculty and students and pursuing academic interests beyond those which may be part of the high school curriculum. Participants receive grades based on the same standards as full-time UCI students and full University credit for their work. Students must meet course prerequisites where applicable.

Qualified students wishing to pursue a particular subject beyond the level offered by the high school may find the advanced courses they need at the University, or perhaps courses of interest not offered at the high school. Not only does UPHSS afford the gifted high school student a source of intellectual stimulation beyond that which the resources of the high school might allow, it also serves to provide the student with an insider's view of the academic environment that UCI has to offer. For further information, please refer to page 36.

How to Use the Catalogue

The *UCI General Catalogue* contains general administrative and academic information, descriptions of schools and departments and their curricula, and descriptions of student activities and services.

Because the *Catalogue* must be prepared well in advance of the year it covers, changes in some programs inevitably will occur. The selection of courses to be offered each quarter is subject to change without notice, and some listed courses are not offered each year. The quarterly *Schedule of Classes*, a publication available from the Registrar's Office shortly before registration begins each quarter, provides more current information on classes to be offered, instructors, how to enroll, enrollment restrictions (for example, open to majors only, or consent of instructor required), class hours, room assignments, and final examination schedules. Students should consult the appropriate academic unit for even more up-to-date information. Admission to UCI does not guarantee enrollment in any particular course. Please refer to Major Campus Publications, page 59.

Presentation of information in the *UCI General Catalogue* is divided into five main concepts (details are found in the Table of Contents):

1. Introduction to UCI
2. Preadmission Matters
3. Information for Admitted Students
4. Information on the Office of Research and Graduate Studies

5. **Schools and Programs:** Instruction and research programs at UCI focus on five fundamental areas of knowledge, while at the same time providing for interdisciplinary and professional study. In the Catalogue, the five basic Schools are presented first: Biological Sciences, Fine Arts, Humanities, Physical Sciences, and Social Sciences. Programs covering interdisciplinary and professional studies are presented next: Information and Computer Science, Social Ecology, Engineering, Management, Medicine, and Teacher Education. The program in physical education, recreation, and intercollegiate athletics is presented last.

Included in the academic unit descriptions are the following kinds of information:

- a. A brief description of what areas are covered in the school or program and a brief statement of the educational philosophy and orientation of the unit.
- b. Lists of faculty members, the institutions from which they received their highest degrees, and their academic areas of interest.
- c. Requirements for the undergraduate and graduate degrees offered including those for majors and minors.
- d. Additional areas of study offered (referred to as concentrations, specializations, emphases, tracks, modules, or options).
- e. Advice about planning a program of study, and other information relevant to the academic progress and experience of students majoring in fields within each school or program.
- f. Courses offered, divided into undergraduate and graduate course listings; those units that are departmentalized present their courses according to the department.

Course Listings

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

Courses with sequential designations (for example, 1A-B-C) normally indicate multiple-quarter courses; *except as noted, each course in a sequence is prerequisite to the one following*. The letter L following a course number usually designates a laboratory course. The letter H preceding a course number usually designates an honors course.

The "(4)" or "(4-4-4)" designation following the course title indicates the unit credits toward the 180 quarter units needed to graduate. Each "4" represents four quarter units. Some courses give other than four units of credit; for example, two, five, or a range of from one to twelve units can be granted.

The letters F, W, or S after the course number and title indicate the quarter(s) in which the course will be offered: fall, winter, or spring. The word "Summer" appears if the course is offered in Summer Session of the academic year covered by this issue of the *UCI General Catalogue*. While efforts have been made to provide information on when a course is

offered, such information is not always available in time for inclusion in the *Catalogue*. The designation "(4) F, W, S" indicates a single course offered that can be taken only once for credit; a "(4-4-4) F, W, S" designation indicates that credit may be earned in each quarter.

When a course is approved for satisfaction of the UCI breadth requirement, the breadth category is indicated by a roman numeral in parentheses at the end of the course description (see pages 53-55).

Courses which have been approved to fulfill the upper-division writing requirement are *not* designated in this *Catalogue*. However, they are designated in the quarterly *Schedule of Classes* with a W following the course number. Students should refer to the *Schedule of Classes* for a complete listing of approved upper-division courses.

Preparing for University Work

A carefully planned program of high school courses provides students with the best preparation for University work, as it establishes a solid basis for undergraduate studies, gives more options for later study, and provides opportunities for more specialized preparation for a chosen field of study. Students need to master certain basic subjects and skills before entering the University so as to increase the likelihood of doing well in University courses. Students may also wish to consider gaining additional preparation at a community college and applying to enter the University as a transfer applicant (see p. 46).

Students planning to enter the University must complete the high school courses required for admission (the "a through f" requirements, see p. 37). Careful thought should be given to adequate preparation in the basic skills of reading, writing, and mathematics described in detail below. In addition, consideration should be given to deciding on a general field of study that might be pursued at the University, so that related college-preparatory elective courses can be taken in high school. A high school counselor or teacher can help select the appropriate courses.

The "a through f" requirements for admission to the University of California are *minimum* entrance standards. Completing the required high school courses with satisfactory grades will not by itself prepare students for freshman work in every subject, much less in a major or program of study. Many entering students discover that they are not adequately prepared for basic University courses, such as English composition or calculus, which they are expected to take in their freshman year. Also, many undergraduate majors, particularly those in the sciences, engineering, and mathematics, require more high school preparation than that necessary for admission to the University. A lack of preparation can cause problems for students who do not choose a major until after they enter the University, or for those who prepare for one major but later decide to change to another.

For these reasons, students should take courses that will prepare them beyond minimum levels of competence both in subject matter content and in general academic skills. This often means selecting the most challenging courses in the basic subjects that are offered in high school. Such courses may be part of an honors program or may be regular courses taught at a challenging level. A good preparation for University work includes English every semester in high school; three to four years of mathematics, including a course in the senior year; two to three years of foreign language; two to three years of laboratory science with content from biology,

chemistry, and physics; two or more years of history and social studies; and one or more courses in fine arts (visual or performing).

It is important to appreciate that good study skills and study habits are essential for doing well at the University. These are developed in the more advanced courses in high school that encourage independent, out-of-class work using library and other resources. University courses often assume that background material is fresh in the student's mind and thoroughly mastered. It is expected that students know how to read a textbook effectively, how to seek help from other books, how to take notes from books or lectures, how to edit and revise a paper, and how to plan a realistic study schedule. It is especially important to take a full academic load during the senior year to be ready for the challenge of University work. Advanced honors-level or advanced placement courses for which students have prerequisites are strongly recommended.

Reading

Many students are not prepared for either the kinds or amounts of reading demanded of freshmen at the University. Each student should become proficient in reading and understanding technical materials and scholarly works and should learn to read analytically and critically, actively questioning the author's intentions, viewpoint, arguments, and conclusions. Students also should become familiar and comfortable with the conventions of standard written English and with various writing strategies and techniques. Reading experience should include original works in their entirety, not just textbooks and anthologies, and should encompass a wide variety of forms and topics.

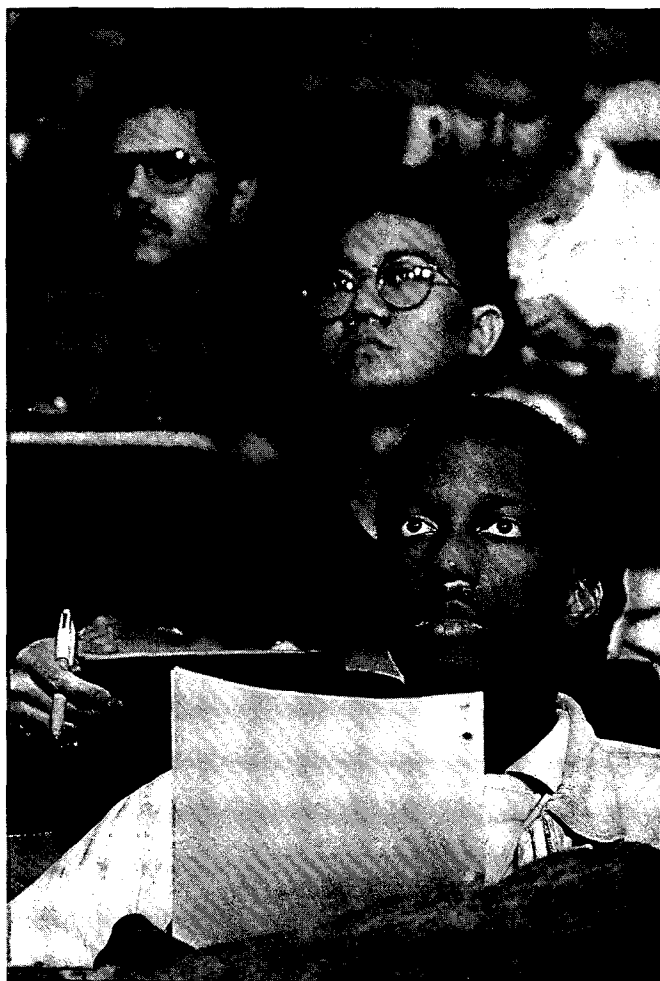
Writing

Effective critical thinking and proficiency with the written language are closely related, and both are skills which every University student must master. By University standards, a student who is proficient in English composition is able to (a) understand the assigned topic; (b) select and develop a theme by argument and example; (c) choose words which aptly and precisely convey the intended meaning; (d) construct effective sentences, i.e., sentences that economically and successfully convey the writer's ideas and display a variety of structures; (e) demonstrate an awareness of the conventions of standard written English, avoiding such errors as sentence fragments, run-together sentences, faulty agreements, and improper pronoun references; and (f) punctuate, capitalize, and spell correctly.

A student planning to attend the University must take English courses in high school that require the development and practice of these skills. University entrance requirements include at least four years of English composition and literature that stress expository writing; the development of persuasive critical thinking on the written page.

Mathematics

Many students are unaware of the large number of fields of study that require preparation in mathematics beyond the minimum three-year requirement for admission to the University. Courses in calculus are included in the requirements for all majors in information and computer science; engineering; the physical, mathematical, and biological sciences; as well as programs leading to professional degrees in fields such as medicine, dentistry, optometry, or pharmacy. Majors in the social sciences require one year of statistics or calculus, or both.



Undergraduate students may choose from among 36 majors as well as from a variety of minors, concentrations, and specializations.

Students should prepare for these courses while in high school so that the appropriate mathematics courses can be taken in the freshman year at the University. Thus the high school program should include a year of precalculus mathematics. This year should provide additional practice in the use of second-year algebra and should include experience with trigonometry, logarithmic and exponential functions with applications and word problems.

Students who are not proficient in understanding basic and advanced (second-year) algebra and solving problems using these concepts will be at an enormous disadvantage in a number of majors at the University. One or more precalculus courses will have to be completed before beginning calculus, and preparatory courses may be needed before taking statistics. The necessity to take these preparatory courses can seriously delay progress in undergraduate studies.

Undergraduate and Graduate Degrees and Areas of Study

Degree Titles

Titles of degrees awarded may not correspond exactly with specific fields of study offered at UCI. For example, graduate students in Anatomy and Neurobiology, Microbiology and Molecular Genetics, and Physiology and Biophysics all earn the Ph.D. in Biological Sciences. Please refer to the appropriate academic unit section of the *Catalogue* for information regarding any area of study.

Subject Area	Degree*	Academic Unit Granting the Degree
Administration	Ph.D.	Graduate School of Management
Anthropology	B.A.	School of Social Sciences
Applied Ecology	B.A.	School of Biological Sciences jointly with the Program in Social Ecology
Art History	B.A.	School of Fine Arts
Biological Sciences	B.S., M.S., Ph.D.	School of Biological Sciences
Business Administration	M.B.A., M.B.P.A.**	Graduate School of Management
Chemistry	B.S., M.S., Ph.D.	School of Physical Sciences
Classical Civilization	B.A.	School of Humanities
Classics	B.A., M.A., Ph.D.	School of Humanities
Comparative Culture	B.A., M.A., M.A.T.** , Ph.D.	School of Social Sciences
Comparative Literature	B.A., M.A., Ph.D.	School of Humanities
Dance	B.A., M.F.A.	School of Fine Arts
Drama	B.A., M.F.A.	School of Fine Arts
Economics	B.A., M.A., Ph.D.	School of Social Sciences
Education	Credential Programs Only	Office of Teacher Education
Engineering	B.S., M.S., Ph.D.	School of Engineering
English	B.A., M.A., M.F.A., Ph.D.	School of Humanities
Environmental Toxicology	M.S., Ph.D.	College of Medicine
Film Studies	B.A.	School of Humanities
Fine Arts	B.A., M.F.A.	School of Fine Arts
French	B.A., M.A., Ph.D.	School of Humanities
Genetics Counseling	M.S.	College of Medicine
Geography	B.A.**	School of Social Sciences
German	B.A., M.A., Ph.D.	School of Humanities
History	B.A., M.A., Ph.D.	School of Humanities
Humanities	B.A.	School of Humanities
Information and Computer Science	B.S., M.S.** , Ph.D.	Department of Information and Computer Science
Linguistics	B.A.	School of Humanities or School of Social Sciences
Mathematics	B.S., M.S., Ph.D.	School of Physical Sciences
Medicine	M.D.	College of Medicine
Music	B.A., B.Mus.	School of Fine Arts
Pharmacology and Toxicology	M.S., Ph.D.	College of Medicine
Philosophy	B.A., M.A., Ph.D.	School of Humanities
Physics	B.S., M.S., Ph.D.	School of Physical Sciences
Political Science	B.A., Ph.D.	School of Social Sciences
Psychology	B.A., Ph.D.	School of Social Sciences
Public Administration	M.B.P.A.** , M.P.A.**	Graduate School of Management
Radiological Sciences	M.S., Ph.D.	College of Medicine
Russian	B.A.	School of Humanities
Social Ecology	B.A., M.A., Ph.D.	Program in Social Ecology
Social Science	B.A., M.A., Ph.D.	School of Social Sciences
Sociology	B.A.	School of Social Sciences
Spanish	B.A., M.A., M.A.T., Ph.D.	School of Humanities
Studio Art	B.A.	School of Fine Arts

*Degrees: B.A. = Bachelor of Arts, B.S. = Bachelor of Science, B.Mus. = Bachelor of Music; M.A. = Master of Arts, M.A.T. = Master of Arts in Teaching, M.F.A. = Master of Fine Arts, M.S. = Master of Science; M.B.A. = Master of Business Administration, M.B.P.A. = Master of Business and Public Administration, M.P.A. = Master of Public Administration; M.D. = Doctor of Medicine; Ph.D. = Doctor of Philosophy.

**Admission for the 1989-90 academic year is not offered for the following: the B.A. degree in Geography; the M.A.T. degree in Comparative Culture; the M.P.A. and M.B.P.A. degrees in the Graduate School of Management; and the M.S. in Information and Computer Science.

Undergraduate Majors, Minors, Concentrations, and Associated Areas of Study

Undergraduate majors are offered in all of the bachelor's degree programs on the list of degree titles; the degree programs are referred to as majors in the following list. In association with these majors, UCI offers a number of minors and formal concentrations. Some concentrations are available in more than one academic unit.

A minor consists of a coordinated set of courses (seven or more) which together take a student well beyond the introductory level in an academic field, subject matter, and/or discipline but which are not sufficient to constitute a major. Minors are listed on a student's transcript but are not listed on the baccalaureate diploma.

UCI offers two interdisciplinary minors, one in Latin American/Chicano Studies, and one in Global Peace and Conflict Studies. Both minors are available to all students regardless of their major. The minor in Latin American/Chicano Studies is focused in the School of Humanities, while the minor in Global Peace and Conflict Studies is focused in the School of Humanities, the School of Social Sciences, and the Program in Social Ecology.

A concentration is a program of interdisciplinary study consisting of courses offered by two or more schools or programs. Concentrations are similar to minors in that they require fewer units of work than majors do, and the area of concentration pursued by a student appears on the transcript but not on the baccalaureate diploma. Concentrations are usually taken in combination with a major in one of the schools or programs offering the concentration.

A specialization is a program of study which enables students to focus on courses in a particular field within a major. The area of specialization pursued by a student appears on the transcript but not on the baccalaureate diploma.

In addition to the formal minors, concentrations, and specializations, other associated areas of study are available. These include emphases, tracks, modules, or options.

Students are urged to become informed of and understand all requirements concerning their intended majors, minors, concentrations, and/or associated areas of study. Special restrictions apply to some majors and minors; for example, some minors require formal application or declaration by students. Other minors may be completed without such formalities.

School of Biological Sciences

Majors:

Biological Sciences

Concentration: Ecology and Environmental Biology

Applied Ecology (offered jointly with the Program in Social Ecology)

School of Fine Arts

Majors:

Art History

Dance

Emphases:

Choreography

Hispanic

History

Performance

Teaching

Drama

Fine Arts (Interdisciplinary)

Music

Specializations (B.Mus. only)

Bassoon

Clarinet

Contrabass

Flute

French Horn

Harp

Lute and Guitar

Oboe

Percussion

Piano

Saxophone

Trombone

Trumpet

Tuba

Viola

Violin

Violoncello

Voice

Special String Performance

Studio Art

Minors:

Art History

Dance

Drama

Music

Concentration: Religious Studies (in combination with any major in the School of Fine Arts, the School of Humanities, or the School of Social Sciences)

Graduate School of Management

Major: Only graduate degrees are offered

Minor: Management

3-2 Program: available to outstanding undergraduates in all majors except Engineering

School of Humanities

Majors:

Classical Civilization

Classics

Emphases:

Greek

Latin

Linguistics

Comparative Literature

English

Emphases:

Literary Criticism

Writing

Film Studies

French

Emphases:

Literature and Culture

Linguistics

German

Emphases:

Literature

Linguistics

History

Humanities (Interdisciplinary)

Individualized Programs

Women's Studies

Linguistics (Also see School of Social Sciences)

Tracks:

- General
- Theoretical and Formal
- Applied

Philosophy

Russian

Emphases:

- Literature
- Linguistics
- Civilization

Spanish

Emphases:

- Literature and Culture
- Linguistics
- Bilingualism and English as a Second Language

Minors:

- Classical Civilization
- Comparative Literature
- English
- Film Studies
- French
- German
- Global Peace and Conflict Studies (Interdisciplinary)
- Greek
- History
- Italian
- Latin
- Latin American and Chicano Studies (Interdisciplinary)
- Linguistics
- Philosophy
- Portuguese
- Russian Area Studies
- Russian Language
- Spanish
- Women's Studies

Concentration: Religious Studies (available in combination with any major in the School of Fine Arts, the School of Humanities, or the School of Social Sciences)

School of Physical Sciences

Majors:

- Chemistry
- Mathematics
 - Specializations:
 - Applied Mathematics
 - Mathematical Statistics
 - Pure Mathematics

Physics

- Concentrations:
 - Applied Physics
 - Biomedical Physics
- Specialization:
 - Astrophysics

Minors:

- Applied Mathematics
- Mathematical Statistics
- Pure Mathematics

School of Social Sciences

Majors:

- Anthropology
- Comparative Culture
- Economics
- Geography
- Linguistics
- Modules

General

Theoretical and Formal

- Political Science
- Psychology
- Social Science
- Sociology

Minors:

- Anthropology
- Comparative Culture
- Global Peace and Conflict Studies (Interdisciplinary)
- Linguistics
- Political Science
- Psychology
- Sociology

Concentration: Religious Studies (available in combination with any major in the School of Fine Arts, the School of Humanities, or the School of Social Sciences)

School of Engineering

Major:

- Engineering
 - Options:
 - Civil
 - Electrical
 - Mechanical

Department of Information and Computer Science

Major: Information and Computer Science

Program in Social Ecology

Majors:

- Social Ecology
 - Specializations:
 - Criminology, Criminal Justice, and Legal Studies
 - Environmental Health and Planning
 - Psychology and Social Behavior
- Applied Ecology (offered jointly with the School of Biological Sciences)

Minors:

- Global Peace and Conflict Studies (Interdisciplinary)
- Social Ecology

Areas of Graduate Study

Programs of graduate study are offered in a wide range of academic disciplines and professional areas. For further information about any area, including the precise titles of the degrees conferred, consult the Index. Credentials that can be earned through the UCI Office of Teacher Education are listed separately.

- | | |
|-------------------------|--|
| Acting | Comparative Physiology |
| Administration | Computer Algorithms and Data Structures |
| Anatomy | Computer Software |
| Anthropology | Computer Systems Design |
| Artificial Intelligence | Computing Organizations, Policy, and Society |
| Biochemistry | Creative Writing |
| Biological Chemistry | Criminal Justice |
| Biological Sciences | Criminology |
| Biophysical Chemistry | Critical Theory |
| Business Administration | Dance |
| Cell Biology | Design |
| Chemistry | Developmental Biology |
| Civil Engineering | Developmental Psychology |
| Classics | Drama |
| Cognitive Sciences | Ecology |
| Comparative Culture | |
| Comparative Literature | |

Economics	Microbiology
Electrical Engineering	Molecular Biology
Engineering	Molecular Genetics
English and American Literature	Music
Environmental Analysis	Musical Theatre
Environmental Design	Neurobiology
Environmental Psychology	Neurosciences
Environmental Toxicology	Occupational Health
Evolutionary Biology	Pharmacology and Toxicology
Fiction	Philosophy
Fine Arts	Physical Sciences
French	Physics
Genetics	Physiology and Biophysics
Genetics Counseling	Political Science
German	Psychobiology
Health Psychology	Psychology
History	Radiological Sciences
Human Development	Social Behavior
Humanities	Social Ecology
Information and Computer Science	Social Networks
Law and Society	Social Relations
Management	Social Science
Mathematical Social Sciences	Sociology
Mathematics	Spanish
Mechanical Engineering	Studio Art
Medicine	Transportation Economics
	Virology

Credential Programs: Teacher Education

Programs leading to credentials are generally taken as one year of postbaccalaureate study but may be taken as part of an undergraduate program.

Administrative Services
 Bilingual/Cross-Cultural Emphasis
 Multiple Subject Instruction (elementary)
 Single Subject Instruction (secondary)
 Special Education (learning handicapped; severely handicapped; and the resource specialist certificate)

Majors and Careers

Choosing a Major

Many students select their University major, the field of study which represents their principal academic interest, at the time they fill out their University of California Undergraduate Application. Some students, however, are not ready to choose a major at the time they apply, and still others may wish to change to a different major after they have enrolled.

In preparation for choosing a major, students need to familiarize themselves as much as possible with UCI and its academic programs. Entering students are exposed to a wide range of areas of study, and it is not unusual for students to become enthusiastic about academic disciplines previously unfamiliar to them. At UCI a number of traditionally separate academic disciplines have strong interrelationships, so that the academic environment is influenced by broad interactions among disciplines. As a complement to classroom study, UCI encourages its students to become involved in a variety of educational experiences such as independent study, laboratory research, field study, writing workshops, computing, and fine arts productions. Such experiences can help students identify additional areas of interest.

The *UCI General Catalogue* is a good place to find specific information about programs available, requirements for majors, and course offerings. In addition to consulting the

Catalogue, students are encouraged to talk to academic counselors and faculty advisors about the opportunities which are open to them. They may go to any department in order to learn more about its programs of study, its requirements for graduation, and possible enrollment limitations. (Some majors, including economics, engineering, and information and computer science, are impacted—that is, more students apply than can be accommodated—and specific conditions must be met for admission to these majors.) While advisors may not be familiar with all fields, they can suggest ways to investigate other areas of study and be helpful in planning a lower-division program which will keep several options open. Courses and workshops designed to assist students in choosing a major are offered by the Career Planning and Placement Center and by the Office of the Dean of Undergraduate Studies, as well as by some of the academic units.

All students are expected to choose a major by the beginning of the junior year. It is important to look well ahead to this decision and to think about it carefully during the freshman and sophomore years. When considering possible majors, students should keep in mind that some major programs require quite specific preliminary study. At the same time, excessive early concentration could reduce a student's options and could cause the student to need more than four years to obtain the baccalaureate degree. Furthermore, courses required for graduation need to be considered. For these reasons, it is desirable for students to plan their programs carefully and thoughtfully, seeking a balance between exposure to a variety of academic areas and completion of courses which are prerequisite to a major under consideration. A qualified student interested in two areas of study may graduate with a double major by fulfilling the degree requirements of any two programs. Certain restrictions may apply; students interested in pursuing a double major should check with their academic advisor.

Once a student selects a major, or decides to change majors, the actual procedure to formalize the decision is not complicated. Students should visit the academic counseling office for their major to obtain current information about planning their program. In addition, a form called the Undergraduate Petition for Change of Major must be completed. The form is available from academic counselors and the Registrar's Office. Entry into the Economics, Engineering, and Information and Computer Science majors is restricted. Students interested in these majors *must* see their academic counselor to determine whether they can enter these majors.

Unaffiliated (Undeclared) Students

Students who enter the University as freshmen or sophomores may be uncertain about which major they should choose and may not feel ready to declare their major until they have been on campus for a while. Such students participate in the General Studies Advising Program (GSAP) which is administered by the Office of the Dean of Undergraduate Studies. The goal of GSAP is to help students make the best informed and most rational choice of a major that is possible. All students at UCI are expected to choose their major by the beginning of their junior year.

To make a good decision about what major to declare, the student should know what programs UCI offers and have some experience with them, have a good knowledge of his or her abilities and interests, have clear educational goals, and have a good sense of his or her vocational goals and of the academic programs at UCI that will provide appropriate preparation for them. Students in GSAP receive individualized counseling that helps them explore the variety of course offerings on campus, become more aware of their own interests and abilities, formulate sound educational goals, and learn how to prepare for possible careers.

Preprofessional Preparation

Law

Law schools want to produce lawyers to serve the entire legal spectrum (for example tax, criminal, entertainment, or immigration law), and this requires a wide range of academic backgrounds. Law schools look less for specific areas of study than they do for evidence of excellence in any academic program. A good record in physics or classics, for example, will be preferred over a mediocre record in history or political science. The majority of law schools give equal preference to students from all academic disciplines. Courses that help develop writing and analytical skills (logic, writing, mathematics, research methods, and statistics courses, for example) build skills that are the key to doing well on the LSAT, succeeding in law school, and entering the legal profession.

UCI offers a number of law-related courses that students in any major may take. The School of Humanities offers courses in logic and the philosophy of law. The School of Social Sciences offers courses in the study of law, international relations, and economics of law and recommends that students take some political science courses as well. The Program in Social Ecology offers many law-related courses in both substantive law (such as environmental and criminal law) and in law and society and criminal justice and offers its majors the opportunity to apply theories learned in the classroom to actual problems through its field study program.

Students interested in applying to law school after completing the baccalaureate degree should know that law schools look closely at five aspects of a student's application: grades, Law School Admissions Test (LSAT) results, the applicant's statement of purpose, in-depth letters of recommendation, and extracurricular activities and law-related work experience.

Students should be aware that not everyone who applies is admitted to law school. One consideration in selecting an undergraduate major is alternative career opportunities should one's career goals change or should experience with law school result in a decision not to enter the field of law.

Medicine and Other Health-Related Sciences

Although leaders in health science education strongly recommend that students obtain a bachelor's degree prior to admission to the health sciences, there is no preferred major. Many students who plan to enter the health professions major in Biological Sciences because much of the basic course work for that major is the same as the preparation required for medical school admission; however, students may major in any academic field as long as they also take the courses required by professional health science schools. The minimum amount of undergraduate preparation required by most medical and health-related schools includes one year each of English, biology with laboratory, general chemistry with laboratory, organic chemistry with laboratory, physics

with laboratory, and college mathematics, especially calculus and statistics. Courses in cell or molecular biology, biochemistry, genetics, developmental physiology or comparative anatomy, and vertebrate embryology are recommended, as is course work in computer science. In addition, some health sciences schools have certain nonscience course requirements or recommended courses in, for example, English and/or a foreign language. Facility with the Spanish language is very helpful in California medical schools and in other areas of the United States with large Hispanic populations.

Although many factors ultimately are considered when reviewing applicants for admission, admission committees look carefully at the following seven areas: college grade point average (science and nonscience grades are evaluated separately, and evidence of improvement in work during the undergraduate years is important); results of the new Medical College Admissions Test (MCAT), the Dental Admissions Test, and other aptitude examination scores; the student's personal essay and/or personal interview; in-depth letters of recommendation; practical experience in the health sciences, whether paid or volunteer, which is regarded favorably as an indication of exposure to and interest in the health sciences; extracurricular activities which demonstrate the applicant's ability to interact successfully with others; and research experience, especially in a biological, medical, or behavioral science.

Since medical programs cannot accommodate all qualified applicants and competition for entrance is keen, it is important to keep in mind alternative career opportunities should one not be accepted to medical, dental, pharmacy, optometry, podiatry, or veterinary school, or should one decide to pursue instead one of the expanding number of health-related programs now available.

Business/Management

The contemporary executive or manager must be a creative thinker, make complex decisions, and have the ability to perceive and participate in the full scope of an enterprise while understanding its role in the economy. Effective management requires leadership ability, strong problem-solving skills, effective oral and written communication skills, analytical skills, an understanding of economic trends, and a basic knowledge of behavioral processes in organizations.

Although UCI does not offer a prebusiness program leading to an undergraduate degree, the Graduate School of Management offers a minor in Management as a supplement to any undergraduate major. This minor can provide students with a broad understanding of management theory and practice. In addition, it may be helpful to students in determining whether they wish to pursue a career in business or management or undertake further study in management at the graduate level.

Students can also supplement their major course work to develop the skills needed for business and management by taking electives such as calculus and basic statistics, economics, microeconomics, macroeconomics, psychology and sociology, computer science, and political science courses.

Most graduate programs in business administration or management do not require prior undergraduate course work in business.

For admission purposes, graduate schools of business look at five areas: grades, scores on the Graduate Management Admission Test (GMAT), the applicant's statement of purpose, in-depth letters of recommendation, and evidence of leadership in school and community activities and work experience. The latter is becoming an increasingly important prerequisite for many programs.

Career Opportunities

The eight academic units at UCI which offer undergraduate education leading to the bachelor's degree provide students with a variety of opportunities to explore a wide range of interests leading to a career choice or to further education at the graduate or professional level. The lists which follow are meant to indicate to students the many and varied career areas pursued by UCI graduates, and to make students aware of some of the vast array of career choices available. Additional discussions of careers are presented in individual academic unit sections.

Any major can lead to any number of careers. Some examples of careers frequently led to by majors available within the academic units at UCI are listed below.

Biological Science Career Areas

Audiology	Oceanography
Bioanalysis	Optometry
Biochemistry	Osteopathy
Biomedical Engineering	Plant Biology
Cell Biology	Pharmacology
Chiropractic Medicine	Pharmacy
Dentistry	Physician's Assistant
Developmental Biology	Physical Therapy
Dietetics	Podiatry
Environmental Management	Prosthetics Design
Forestry	Public Health
Genetic Engineering	Quality Control
Health Administration	Research
Industrial Hygiene	Sales
Marine Biology	Speech Pathology
Medical Technology	Teaching
Medicine	Technical Writing and Editing
Microbiology	Veterinary Medicine
Nurse Practitioner	
Occupational Therapy	

The health field is one of the fastest-growing career areas in the country. Work sites may include private corporations, educational institutions, hospitals, health care complexes, private foundations, city and county governments, state agencies, the federal government, and many others.

Engineering Career Areas

Aerospace	Engines and Fuels
Biomedical	Environmental Control
Communications	Land Development and Urban Planning
Computer Architecture	Materials
Computer Software	Process Control
Construction and Project Management	Public Works
Control Systems	Robotics
Digital Signal Processing	Structures
Electric Power	Transportation
Electronics	Water Resources
Electro-optics	

These are some of the employment opportunities available to UCI engineering graduates. Their careers typically involve them in one or more of the following: design, research and development, manufacturing or construction, operations, consulting, applications and sales, management, or teaching.

At UCI they will have had the choice of civil, electrical, or mechanical engineering. However, they will frequently find challenging positions in related areas such as aerospace, biomedical, chemical, or industrial engineering, for which their general and specialty coursework at UCI, followed by formal or informal, on-the-job training will qualify them. Approximately half of UCI's engineering graduates eventually obtain advanced degrees (at UCI or elsewhere), and almost all engage in some sort of continuing education to keep abreast of advances in technology. Many engineering graduates have used their engineering background to enter graduate programs and obtain degrees in the fields of administration, law, medicine, physics, or mathematics.

Fine Arts Career Areas

Advertising	Librarianship
Animation	Lighting
Arts Administration	Marketing
Art Therapy	Medical Illustration
Broadcasting	Performance
Choreography	Photography
Commercial Art	Physical Fitness
Composition	Printing
Conducting	Production
Consulting	Publicity
Criticism	Public Relations
Curating	Publishing
Direction	Retail Sales
Environmental Design	Set/Stage/Costume Design
Instrument Repair/Tuning	Teaching
Interior/Industrial Design	Tourism
Journalism	Writing

The exceptionally talented Fine Arts graduate may choose to become a professional actor, art historian, artist, dancer, or musician. However, there are many other careers to explore in numerous arts-related areas, or the Fine Arts graduate may wish to combine part-time professional performance with supplemental work. The field of arts administration is an increasingly important career area, offering opportunities to work with opera and dance companies, repertory theatre companies, museums, state and local arts councils, community arts organizations, and arts festivals.

Humanities Career Areas

Advertising	Personnel
Banking	Public Administration
Broadcasting	Public Relations
Business	Publicity
Foreign Service	Publishing
Government Service	Research
Human Resources	Retail Sales
Insurance	Social Welfare
International Relations	Teaching
Journalism	Technical Writing
Law	Tourism
Library Science	Translating/Interpreting
Management/Administration	Writing
Marketing	

Diverse career fields available to Humanities graduates include entry-level positions in both the public and private sectors or professional-level opportunities combining the

degree with further specialization. Humanities graduates may also elect to enter professional programs such as law, library science, or public administration. Business and industry utilize Humanities graduates for management training programs in banking, retail sales, and insurance. Graduates with special skills in oral and written communications may look to positions with newspapers, advertising agencies, public relations firms, radio and television stations, and publishing houses.

Technical writers are currently in demand, particularly those who have had some preparation in engineering, computer science, and the sciences. Opportunities for graduates fluent in foreign languages exist in government, business, social service, counseling, foreign service, and international trade, among others.

Information and Computer Science Career Areas

Applications Programming	Software Maintenance
Business Applications	Software Management
Scientific Applications	Systems Analysis
Text Processing	Systems Design
Marketing of Computer-related Products	Systems Programming

Graduates of the Department of Information and Computer Science have found initial employment as programmers, software designers, systems analysts, and in sales and service of computers and software. Some graduates work for companies which manufacture computer hardware and/or develop computer software. Others work for organizations which use computers and computer services to solve a variety of problems ranging from business data processing to the simulation of integrated circuits.

Physical Science Career Areas

Actuarial Science	Organic Chemistry
Analytical Chemistry	Pharmacology
Biochemistry	Physical Chemistry
Computers	Physics and Applied Chemistry
Electronics	Psychological and Laboratory Data
Engineering, Applications in Food Chemistry	Quality Control
Forensic Chemistry	Radar
Geochemistry	Radiation Chemistry
Inorganic Chemistry	Solid State Devices
Medicine	Statistics
Nuclear Chemistry	Teaching
Nuclear Reactors	
Optical Devices	

Graduates of the School of Physical Sciences have backgrounds appropriate for a variety of areas in research and management. Career opportunities for chemists are found in federal, state, and local government as well as in private industry. Water districts, crime labs, and major chemical and oil companies are good resources for employment. Chemists may also work in research and development and in jobs dealing with health, pollution, energy, fuel, drugs, and plastics. Mathematics graduates find employment in both government and the private sector in such technical fields as operations research, computer programming, marketing research, actuarial work, banking, retail management, and scientific research. Physics graduates find employment as computer programmers, laboratory technicians, systems analysts, test engineers, safety engineers, radar specialists, quality control technicians, technical writers, and high school and college teachers, as well as in research.

Social Ecology Career Areas

Administration	Law
Advertising	Management/Administration
Air Quality Control	Marketing
Architecture	Mental Health
Biostatistics	Program Coordination
Corrections/Probation	Psychology
Counseling	Public Health Research
Education Support Services	Public Relations
Environmental Design	Real Estate/Development
Environmental Planning and Consulting	Research and Research Design
Epidemiology	Social Service
Government Service	Teaching
Health Service	Urban Planning
Hospital Administration	Urban Sociology
Housing Development	Water Quality Control

Graduates in Social Ecology may hold positions as urban planners, environmental consultants, juvenile probation officers, counselors, elementary and secondary school teachers, legal aides, coordinators of juvenile diversion programs, social workers, mental health workers, special education teachers, or architectural consultants. Graduate programs of interest to Social Ecology graduates include those in law; clinical, community, social, developmental, and environmental psychology; public health; public and business administration; environmental studies; urban planning; social welfare; criminology; and the administration of justice.

Social Science Career Areas

Banking	Marketing
Correction/Probation	Personnel
Counseling	Psychology
Finance	Public Relations
Foreign Service	Publishing
Government Service	Real Estate
Health Services	Research
Industrial Relations	Sales
Insurance	Social Service
International Affairs	Statistical Analysis
Labor Relations	Teaching
Law	Urban Planning
Library Science	Writing
Management/Administration	

Business and industry often look to the Social Science graduate to fill positions in management, finance, marketing and advertising, personnel, production supervision, and general administration. In the public sector, a wide variety of opportunities are available in city, county, state, and federal government. Teaching is a frequently chosen career at all levels from professor to elementary school teacher. In addition, many graduates enter professional practice, becoming lawyers, psychologists, researchers, or consultants of various kinds.

Placement Testing

UCI administers a system of placement testing which is designed to help undergraduate admitted students assess their level of academic preparation for University-level course work in selected subject areas. These exams, which have been developed by University faculty, have established test score guidelines which serve as a criterion for course enrollment. The results of these examinations enable academic advisors and students to select the student's appropriate course of study. Placement exams are given before registration for classes and assist academic advisors in helping students plan academic programs and make career choices. *Students are encouraged to talk with academic counselors and advisors in order to formulate a plan of study which is best suited to their learning needs and career goals.*

The placement examinations are administered by the Program of Academic Support Services (PASS), a division of the Office of Undergraduate Studies. Detailed information about placement examinations will be sent from PASS to all newly admitted students. Further information may be obtained by telephoning (714) 856-6206.

Placement testing is given in the areas of English as a second language, reading, chemistry, precalculus, and college algebra.

1. English as a Second Language (ESL) Placement Examination. This examination is required of students (a) whose native language is not English, (b) whose Verbal Scholastic Aptitude Test (SAT) score is 350 or below, (c) who have not satisfied the Subject A requirement, *and* (d) who have received a letter from the ESL Placement Program requiring them to take the ESL Placement Examination. Scores from the Test of English as a Foreign Language (TOEFL) are not considered. The ESL Placement Examination also is required of students referred to the ESL Program on the basis of their score on the Universitywide Subject A Examination.
2. Sequential Test of Educational Progress (STEP) Reading Examination. Students who have a Verbal SAT score of 400 or below are urged to take this examination.
3. Chemistry Placement Examination. Students who plan to enroll in Chemistry 10 or Chemistry 1A are required to take this examination.
4. Precalculus Placement Examination. Students who plan to enroll in Mathematics 2A must first take this examination. Students who have received *either* a score of 600 or higher on the College Board Advanced Mathematics Achievement Test (Level Two) *or* a score of 3, 4, or 5 on the Mathematics Advanced Placement AB or BC Examination are exempt from taking the Precalculus Placement Examination.
5. College Algebra Examination. Students who plan to enroll in Mathematics 1 or who have not had a prior course in trigonometry and who plan to enroll in mathematics courses at UCI are strongly encouraged to take this examination.

Students are strongly encouraged to take the placement examinations during the spring prior to their enrolling in classes at UCI. (The spring testing date is usually in the latter half of May; all newly admitted students are notified.) Test results are then available in time for students to meet with their academic counselors to plan their academic program. In addition to the spring date, placement examinations are also given on the following dates: September 18 and 19, 1989 (during Orientation Week) and other dates to be announced.

University Subject A Examination

The University of California system has established the Universitywide Subject A Examination. Results from this examination are used to place students in UCI writing and, if needed, ESL courses. There is a \$35 nonrefundable administrative fee associated with the examination. The fee payment process and waiver information are explained in materials students receive in April from the Educational Testing Service. Students who receive admission application fee waivers will automatically have this exam fee waived. Please see page 52 for complete information on the Universitywide Examination.

Student Affirmative Action

Student affirmative action involves the provision of equal opportunities for admission and success at the University, and specifically for increased enrollment, greater retention, and higher graduation rates of underrepresented students who are regularly admissible to the University.

Educational Opportunity Program

The goal of the Educational Opportunity Program (EOP) is to encourage representation of low-income and/or underrepresented students by assisting them in enrolling and succeeding at the University. The Educational Opportunity Program is designed to assist students in overcoming obstacles by providing counseling on admissions and financial aid, and referral to the Student Academic Advancement Services Office for advising, tutoring, and learning skills services. Special assistance on a continuing basis is available to all EOP students through the Counseling Center, the Tutorial Assistance Program, Learning Skills Services, and the Student Academic Advancement Services Office. Additional information and personal admissions counseling may be obtained from the EOP/Student Affirmative Action staff by telephoning (714) 856-7484.

Students from low-income and/or underrepresented groups are encouraged to apply. EOP assists those who are regularly admissible to the University, and also those who may not have met all of the regular admissions requirements but who can offer evidence supporting their ability to achieve at the University level. With the exception of American Indians, only residents of the State of California are eligible to apply for EOP sponsorship. American Indian applicants must document their tribal affiliation.

Admission

Prospective students interested in EOP must complete the regular UC admission forms and follow all procedures. Applicants should take particular care with the required essay and indicate their interest in EOP by marking the appropriate places provided on the application. Applications may be obtained from counseling offices in California high schools and community colleges, the UCI Office of Admissions, or the EOP/SAA-Outreach Office. Applicants who require special admissions consideration are advised to submit two letters of recommendation from teachers, counselors, persons in the community, or employers, which document the student's background, motivation, and academic potential.

Financial Assistance

Personal financial resources should not be the determining factor in deciding whether or not to attend college. All students admitted to UCI, including EOP students, are eligible

for financial assistance on the basis of demonstrated need. Funds can be provided to cover room and board, fees, books and supplies, and living expenses, when a student or family is unable to fully meet these expenses. Financial aid is comprised of a combination or "package" of grant, loan, scholarship, and/or part-time employment based on the individual circumstances of the applicant. Additional information is provided in the Financial Aid section, page 30.

Undergraduate Student Affirmative Action Outreach Program

The purpose of the Student Affirmative Action Outreach Program is to attract underrepresented minority students who are regularly admissible to UCI. Campus representatives visit high schools, community colleges, and community centers to meet with students, parents, teachers, and school officials to discuss educational opportunities at UCI. The program also includes a series of seminars and workshops aimed at orienting students to specific academic disciplines, particularly mathematics, physics, computer science, chemistry, biology, and engineering where minorities historically have been underrepresented.

Early Academic Outreach Program

Young students are the focus of the Early Academic Outreach Program. The program is designed to ensure that more students from underrepresented groups become eligible for admission to the University. Students and parents are provided information and skills development sessions and are advised as to the appropriate courses to take for University preparation. Additional information about these programs is available by telephoning (714) 856-7482.

Summer Pre-Entry Program for Medical Students

This program is designed to introduce newly accepted minority and/or disadvantaged medical students to the type and volume of study materials they will encounter during their medical education. Additional information is available in the College of Medicine section.

Summer Premedical Program

This program seeks to increase the number of minority and/or disadvantaged students who are accepted into medical school by providing participants with the special skills and prerequisites needed to obtain an M.D. degree. Additional information is available in the College of Medicine section.

Student Academic Advancement Services

The Office of Student Academic Advancement Services (SAAS) provides students from economically disadvantaged backgrounds, who are first-generation college students, disabled students, and underrepresented students with support services to help them succeed and earn their University degree.

A primary responsibility of SAAS is to monitor the academic progress of its students. In order to best assist students who are having difficulty with their course work, professional counselors maintain a close liaison with academic departments. When needed, referrals to other campus support services are provided. In conjunction with these academic and service units, the Engineering and Computer Science Educational Laboratory (ECSEL) program, a graduate school preparatory course, and a variety of workshops are offered throughout the year by SAAS.

SAAS also sponsors and conducts the Summer Bridge Program for underprepared students who demonstrate the

potential to succeed at the University. The Program is designed to provide and refine basic academic skills necessary for students to successfully complete their course work during the regular school year.

Students are encouraged to make appointments with the Office of Student Academic Advancement Services; telephone (714) 856-6234.

Graduate and Professional Opportunity Program

Through the Graduate and Professional Opportunity Program (GPOP), positive steps are being taken to increase the participation of minorities, and women in certain fields, in the graduate academic and professional programs of the University. Appropriate assistance is offered during the admission process, and every effort is made through GPOP advising and support to ensure that all students will have an opportunity to attain their academic objectives. GPOP strives to match the financial and academic needs of students through its fellowship, Faculty Mentor, and Minority Summer Research Internship programs.

Expenses and Fees

Estimated Expenses

The range of estimated nine-month expenses for students attending UCI during the 1989-90 academic year follows:

Student Status	Living Arrangement	Estimated Range of Nine-Month Expenses ¹
Undergraduate	On Campus	\$ 9,550
	Off Campus	9,030-9,642
	At Home	5,960
Graduate	On Campus	10,430
	Off Campus	10,650-12,050
	At Home	6,840
Medical ²		
First Year (10 months)	On Campus	11,235
	Off Campus	13,045
	At Home	7,246
Second Year (10 months)	On Campus	13,003
	Off Campus	14,813
	At Home	9,014
Third Year (12 months)	On Campus	14,359
	Off Campus	16,531
	At Home	9,572
Fourth Year (12 months)	On Campus	13,884
	Off Campus	16,056
	At Home	9,097

¹Includes fees. All fees are subject to change without notice, and the University may impose additional fees. Fee payment dates are announced in the quarterly *Schedule of Classes*.

²Student expense detail is available from the College of Medicine Financial Aid Office.

NOTE: For nonresidents of California, the above estimated expenses apply, plus \$5,799 annual Nonresident Tuition.

Estimates of expenses for students living off campus vary depending upon number of roommates, location of apartment, amenities, and other factors. Graduate student expenses assume two students sharing a two-bedroom apartment. All other on- and off-campus estimates are based on two students sharing a bedroom. Figures are based on annual surveys and are intended only as a guide in computing average expenses.

**Fees for Academic Year
1989-90***

	Under- graduate	Graduate	First- and Second-Year Medical	Third- and Fourth-Year Medical
University Registration Fee	\$ 653.00	\$ 653.00	\$ 653.00	\$ 733
Educational Fee	\$ 924.00	\$ 924.00	\$ 924.00	\$1,232
Associated Students Fee/Associated				
Graduate Students Fee	\$ 39.00	\$ 27.00	\$ 27.00	\$ 36
University Center Fee	\$ 142.50	\$ 142.50	\$ 142.50	\$ 156
Bren Events Center Fee	\$ 69.00	\$ 69.00	\$ 69.00	\$ 92
	<u>\$1,827.50</u>	<u>\$1,815.50</u>	<u>\$1,815.50</u>	<u>\$2,249</u>

* Amounts for undergraduate, graduate, and first- and second-year medical student fees are based on three quarters of attendance.

Special Expenditures

Special expenditures beyond the cost of books and basic supplies may be associated with certain courses of study. For example, field study assignments may involve transportation expenses; students who take a dance class may be required to wear a certain type of shoe; a student may need a calculator for a certain class.

Fees

Fees for the 1989-90 academic year are shown in the accompanying table. Undergraduate, graduate, and first- and second-year medical student fees are based on three quarters of attendance. Third- and fourth-year medical student fees are based on four quarters of attendance.

Under terms of the Alan Pattee Scholarship Act a surviving child of a California resident who died as a result of accident or injury incurred in the performance of active law enforcement or active fire suppression and prevention duties is eligible to apply for waiver of certain fees. Additional information concerning this Act is available from the Registrar's Office.

Payment of Fees

Fees for each quarter are due and payable in advance within deadlines published in the *Schedule of Classes*. A student will not be enrolled in classes or receive any University benefits until fees are paid in full. Information on the cancellation/withdrawal from UCI procedure is available on page 58. Fee refund information is located on page 30.

Registration Fee

The University Registration Fee is \$218 per quarter for the fall and winter quarters and \$217 for the spring quarter. The full fee is required of all students regardless of the number of courses taken. This fee, which must be paid at the time of registration, is a charge to each student for services which benefit the student and which are complementary to, but not a part of, the instructional programs. No part of this fee is refundable to students who do not use all or any of these services. Graduate students studying out of the State may be eligible to pay one-half of the Registration Fee.

The \$100 advance deposit on the Registration Fee (Undergraduate Acceptance of Admission Fee), required of new undergraduates, is applied to the full fee when the student registers. Continuing students are required to pay all outstanding fines and other debts, in full, before they pay their Registration Fee for an upcoming term.

Medical students are required to pay the full Registration Fee for each fall, winter, and spring quarter, and a reduced Registration Fee for each summer quarter. As of spring 1989, the fee for summer quarter, 1989 was \$80.

Educational Fee

The Educational Fee for undergraduate students is \$308 per quarter for all full-time undergraduate and graduate students.

Medical students are required to pay the Educational Fee for each quarter in which they enroll, including the summer quarter.

Associated Students Fees

The Associated Students Fee is \$13 per quarter for undergraduates and \$9 per quarter for graduate and medical students. The undergraduate student fee is administered by the Associated Students of UCI; the graduate and medical student fees are administered by the Associated Graduate Students and the Medical Students Organization, respectively. These funds provide social activities, lectures, forums, concerts, and other activities at either a reduced charge, or no charge, to UCI students. The fees are required of all students.

University Center Fee

The University Center Fee is \$47.50 per quarter. The fee is required of all students regardless of the number of courses taken. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs of the University Center.

Bren Events Center Fee

The Bren Events Center Fee is \$23 per quarter. The fee is required of all students regardless of the number of courses taken or units carried. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs of the Bren Events Center.

Part-Time Status

Undergraduate and graduate students on approved part-time status (enrollment in 10 units or less per quarter for undergraduates and in eight units or less per quarter for graduate students, including physical education units) pay the full University Registration Fee and one-half the Educational Fee paid by students on full-time status. Those part-time students who have been determined to be nonresidents of the State of California are assessed one-half the Nonresident Tuition, in addition to the Registration and Educational Fees. Students seeking part-time status must obtain the approval of the appropriate academic dean. Part-time status can be granted only for reasons of financial need, health, or family responsibilities. Part-time status lapses at the end of each academic year, therefore, a student must reapply each year that part-time status is desired.

Miscellaneous Fees

Undergraduate Acceptance of Admission Fee ¹ (applied toward University Registration Fee)	\$100.00
Application Fee ^{1,2} (includes intercampus transfers)	35.00
Application Fee for Readmission ¹	35.00
Advancement to Candidacy for Ph.D.	25.00
Duplicate Diploma	22.00
Duplicate Diploma, College of Medicine	75.00
Filing Fee (graduate programs)	109.00
International Student Health Insurance Fee (per quarter)	99.00
Special Library Borrowing Privilege Per Year, (nonrefundable, renewable)	50.00
Transcript of Record (per copy)	3.00
Verification of Student Status (per copy)	3.00

Service Charges

Bus Coupon Book (20 rides)	\$ 8.00
Bus Passes for students (monthly, sold through Parking and Transportation Services Office)	12.00
Changes in Class Enrollment after Announced Dates (each transaction)	3.00
Credit by Examination (each petition)	5.00
Duplicate Registration and/or Other Cards from Registration Packet (each petition)	3.00
Late Payment of Fees	50.00
Late Enrollment in Classes	50.00
Returned Check Collection	10.00
Parking Fees ³	
Student preferred, annual purchase ⁴ only	315.00
Student general, quarterly	69.00
annual ⁴	198.00
Student resident, quarterly	69.00
annual ⁴	198.00
Student remote, quarterly	30.00
System of Interactive Guidance (SIGI) Fee for a maximum of four hours use	12.00
additional use per hour	2.50

In addition, students will be assessed replacement costs for breakage of departmentally issued equipment and supplies.

¹Nonrefundable in all cases.

²The \$35 entitles an applicant to apply to one UC campus. Applicants who are applying to more than one campus must pay an additional \$35 fee for each campus chosen.

³UC parking systems are, in accordance with Regents policy, self-supporting auxiliary enterprises receiving no State appropriations.

⁴Fall, winter, and spring quarters.

Nonresident Tuition Fee and California Residence

Students who have not been residents of California for more than one year immediately prior to the residence determination date are charged, along with other fees, a Nonresident Tuition Fee of \$1,933 for each quarter or \$5,799 per year for each year of attendance required by the curriculum, whether such year extends over three or four academic quarters. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter, and for schools on the semester system, the day instruction begins for the semester. Nonresident undergraduate and graduate students on approved part-time status shall pay one-half the Nonresident Tuition.

Inquiries from prospective students regarding residence requirements for tuition purposes should be directed to the Residence Deputy in the Registrar's Office. No other University personnel are authorized to supply information relative

to residence requirements for tuition purposes. Any student, following a final decision on residence classification by the Residence Deputy, may make written appeal to the Legal Analyst Residence Matters (590 University Hall, University of California, Berkeley, California 94720) within 90 days after notification of the final decision by the Residence Deputy.

General

In order to be classified as a resident for tuition purposes upon admission, an adult student, except an adult alien present in the United States and classified as a nonimmigrant which precludes the adult alien from establishing domicile in the U.S., must have established their residence in California for more than one year immediately preceding the residence determination date for the term for which the student proposes to attend the University and must relinquish any prior residence. An adult student must couple their physical presence within the State of California for one year with objective evidence that such presence is consistent with the student's intent in making California their permanent home and, if these steps are delayed, the one-year durational period will be extended until BOTH presence and intent have been demonstrated for one full year. Physical presence within the State solely for educational purposes does *not* constitute the establishment of California residence under State law regardless of the length of the student's stay in California.

Relevant indicia which can be relied upon to demonstrate a student's intent to make California their permanent residence include, but are not limited to, the following: registering and voting in California elections; designating California as the student's permanent address on all school and employment records, including military records if the student is in the military service; obtaining a California driver's license or, if a nondriver, a California Identification Card; obtaining California vehicle registration; paying California income taxes as a resident, including income earned outside the State; establishing an abode where the student's permanent belongings are kept within California; licensing for professional practice in California; and the absence of these indicia in other places during any period for which residence in California is asserted. Documentary evidence may be required. No single factor is controlling or decisive. All relevant indicia will be considered in the classification determination.

The residence of the parent with whom an unmarried minor (under age 18) child maintains their place of abode is the residence of the unmarried minor child. When the minor lives with neither parent, the minor's residence is that of the parent with whom the minor maintained their last place of abode. A minor, except a minor alien in the United States who is classified as a nonimmigrant which precludes the minor alien from establishing domicile in the U.S., may establish their residence when both parents are deceased and a legal guardian has not been appointed. The residence of an unmarried minor who has a parent living cannot be changed by the minor's own act, by the appointment of a legal guardian, or by relinquishment of a parent's right of control.

Each student establishes their own residence, which is not derivative from that of the student's spouse.

Procedures

New and returning students are required to complete a Statement of Legal Residence. The student's status is determined by the Residence Deputy who is located in the Registrar's Office.

All students classified incorrectly as residents are subject to nonresident status and to payment of all nonresident fees not paid. If incorrect classification results from false or concealed

facts by the student, the student is subject to University discipline. Resident students who become nonresidents must immediately notify the Residence Deputy.

Exceptions

1. A student who is a U.S. citizen or eligible alien who remains in this State after their parent, who was a California resident for at least one year immediately prior to leaving and has, during the student's minority and within one year immediately prior to the residence determination date, established residence elsewhere, shall be entitled to resident classification. This classification will continue until the student has attained the age of majority and has resided in the State the minimum time necessary to become a resident so long as, once enrolled, the student maintains continuous attendance at an institution.
2. A student who is a U.S. citizen or eligible alien who is a minor or 18 years of age and can give evidence that they have been totally self-supporting through employment and actually present within California for the entire year immediately prior to the residence determination date and have evidenced the intent to make California the permanent home may be eligible for resident status.
3. A student who is a U.S. citizen or eligible alien shall be entitled to resident classification if immediately prior to the residence determination date they have lived with and been under the continuous direct care and control of any adult or adults other than a parent for not less than two years, provided that the adult or adults having such control have been California residents during the year immediately prior to the residence determination date. This exception continues until the student has attained the age of majority and has resided in the State the minimum time necessary to become a resident, so long as continuous attendance is maintained at an institution.
4. A student who has not been an adult resident of California for more than one year and who is the dependent child of a California resident who has been a resident for more than one year immediately prior to the residence determination date may be entitled to resident classification until the student has resided in California for the minimum time necessary to become a resident so long as continuous attendance is maintained at an institution.
5. Exemption from payment of the Nonresident Tuition Fee is available to the natural or adopted child, stepchild, or spouse who is a dependent of a member of the United States military stationed in California on active duty. Such exemption may be maintained until the student has resided in California the minimum time necessary to become a resident. If a student is enrolled in an institution and the member of the military (a) is transferred on military orders to a place outside the state where the member continues to serve in the armed forces of the United States, or (b) is retired as an active member of the armed forces immediately after having been on active duty in California, the student is entitled to retain the exemption under conditions set forth above.
6. A student who is a member of the United States military stationed in California on active duty, except a member of the military assigned for educational purposes to a State-supported institution of higher education, shall be entitled to resident classification until the student has resided in the State the minimum time necessary to become a resident.
7. Children of deceased public law enforcement or fire suppression employees, who were California residents and who were killed in the course of law enforcement or fire suppression duties, may be entitled to resident status.
8. To the extent funds are available, the unmarried, dependent child under age 21 or the spouse of a member of the University faculty who is a member of the Academic Senate may be eligible for a waiver of the nonresident tuition.
9. A student who is the dependent of a full-time employee of the University of California who is permanently assigned to work outside of California may be entitled to resident classification.



Students meet in Aldrich Park, a 21-acre arboretum in the center of campus, to study or relax.

Reclassification

Continuing students at UCI who are classified as nonresident for tuition purposes and believe that they will be eligible for resident status the next quarter must file a reclassification petition at the Registrar's Office no later than the fee payment deadline for that quarter. The deadline is published in the quarterly *Schedule of Classes*.

Effective fall 1985, the University of California reclassification regulations were amended as indicated below:

In determining a student's eligibility for reclassification, financial independence is included among the factors considered in evaluating intent to establish residence in California. The California Legislature has defined as financially independent those students who meet the following criteria for the current and three immediately preceding calendar years:

That the student has not been claimed as an exemption for state and federal income tax purposes by his or her parents;

That the student has not received more than \$750 from his or her parents; and

That the student has not lived in the home of his or her parents for more than six weeks in any given year.

Students whose parents have been California residents for at least one year immediately prior to the residence determination date are not subject to the financial independence factor when applying for reclassification.

Financial independence is not included as a factor for graduate student teaching assistants, research assistants, and teaching associates who are employed on a 0.49 or more time basis for the quarter for which reclassification is sought.

In determining whether a student has objectively manifested intent to establish California residence, financial independence shall weigh in favor of finding California residence for reclassification purposes, and financial dependence shall weigh against finding California residence for reclassification purposes.

Financial dependence in the current and preceding calendar year shall weigh more heavily against finding California residence for reclassification purposes than shall financial dependence in earlier calendar years.

A student who is financially dependent in the current and preceding calendar year shall be found to be a California resident for reclassification purposes *only if no factors exist which evidence the student's continuing residence in another state.*

Time Limitation on Providing Documentation.

If additional documentation is required for either an initial residence classification or a reclassification but is not readily accessible, the student will be allowed a period of time no later than the end of the applicable term to provide such documentation.

Inquiries and Appeals

The student is cautioned that this summation is not a complete explanation of the law regarding residence. The student should also note that changes may have been made in the rate of nonresident tuition and the residence requirements between the time this catalogue statement is published and the relevant residence determination date. Regulations have been adopted by The Regents, and a copy is available for inspection in the Registrar's Office.

Fee Refunds

Student Fee Refunds

Students who pay fees for a regular academic quarter and then decide to withdraw from the University must submit a Cancellation/Withdrawal form, together with their identification card for the current quarter, to the Registrar's Office after obtaining the signatures of their academic dean and the University Ombudsman. Medical students must submit the form to the Curricular Affairs Office in the College of Medicine. This form serves two purposes: (1) a refund of fees, if applicable; and (2) automatic withdrawal from classes.

The effective date of withdrawal used in determining the percentage of fees to be refunded is the date on which the student submits the Cancellation/Withdrawal form to the Registrar's Office, or, in the case of medical students, to the Curricular Affairs Office. It is presumed that no University services will be provided to the student after that date. Registration fees are refunded as follows:

New Undergraduate Students. Prior to Orientation Week, fees are refunded in full except for the \$100 Statement of Intent to Register deposit. During Orientation Week and thereafter, the \$100 Statement of Intent to Register deposit, Associated Students Fee, University Center Fee, Bren Events Center Fee, and International Student Health Insurance Fee (if applicable) are withheld. The refund of the Registration

Fee, Educational Fee, and Nonresident Tuition Fee (if applicable) is prorated according to the schedule below.

Continuing Undergraduate and Graduate Students. Prior to Orientation Week, fees are refunded in full, except for a \$10 service charge. During Orientation Week and thereafter, the Associated Students Fee, University Center Fee, Bren Events Center Fee, and International Student Health Insurance Fee (if applicable) are withheld. The refund of the Registration Fee, Educational Fee, and Nonresident Tuition Fee (if applicable) is prorated according to the schedule below.

Schedule of Refunds for Registration Fee, Education Fee, and Nonresident Tuition (if applicable)

Calendar days from first day of instruction	Refund
1-14	80 percent
15-21	60 percent
22-28	40 percent
29-35	20 percent
over 35	no refund

Claims for refund of fees must be presented during the fiscal year (July 1 to June 30) in which the claim is applicable. Refund checks are issued by the Accounting Office and are mailed to the student generally four to six weeks after the official notice of withdrawal is initiated.

If any portion of a student's fees has been paid by the University or outside sources, that portion of the refund will be returned directly to the source of those funds. Students who are receiving financial aid and withdraw from UCI during a quarter will have to repay a portion of their aid based on the same schedule as UCI's refund policy.

Housing Refunds

UCI Housing Contracts provide students with complete housing refund policies.

Financial Aid

Lack of funds need not be a barrier to attending UCI; almost 40 percent of UCI's enrolled students receive some form of financial aid. Students who demonstrate that they need financial assistance in order to attend may be eligible for financial aid through the Financial Aid Office. In addition to awarding aid on the basis of financial need, the Office also offers some scholarships based on academic excellence.

Students who receive financial aid may receive funds from one or more of the following sources: scholarships, grants, loans, and work-study. These sources are described briefly in the following sections; more detailed information can be obtained from the Financial Aid Office.

To obtain financial aid, new and continuing students must file the Student Aid Application for California (SAAC) and the necessary supporting documents each year. Students are encouraged to apply as early as possible. The SAAC is available at high schools, local colleges and universities, and at the UCI Financial Aid Office. Forms, information regarding the application process, deadlines, and financial aid programs for undergraduate, graduate, and medical students may be found in the Financial Aid Application Packet. The packet is mailed to entering students in December and is available to continuing students in January in the Financial Aid Office. The priority deadline for loans, work-study, and most grants is March 2. The University expects the student and the parent (or spouse) to contribute toward the educational costs to

every extent possible. For dependent students, an analysis of the SAAC and supporting documents determines the amount a student and the student's parents can be expected to contribute toward the cost of the student's education. For independent students, the analysis determines the amount a student and/or spouse can contribute to the cost of the student's education. Income, assets, size of family, and the number of family members in college are the major factors considered in the analysis. Assets include, but are not limited to, equity in real estate; stocks, bonds, and other securities; business and farm equity; and cash, savings, and checking accounts. Income includes wages, salaries, interest, dividends, and non-taxable income such as Social Security and Veterans' benefits.

All undergraduate financial aid applicants also are required to apply for a Pell Grant, and in addition eligible California residents are required to apply for a Cal Grant A or a Cal Grant B. The application deadline for Cal Grants A and B is March 2 for the following academic year.

Special Expenditures

Financial aid recipients who are in need of money for special expenditures (beyond the cost of books and basic supplies associated with certain courses of study) may make an appointment to see a financial aid counselor to explore the possibility of a budget extension, based on the availability of funds. Examples of such special expenditures include transportation costs for a field study assignment, special shoes for a dance class, or special equipment for disabled students.

UCI Policy on Satisfactory Academic Progress for Financial Aid

Undergraduate and Graduate Students

In defining student eligibility for financial aid, the Higher Education Act Amendments of 1986 state that a student must maintain "satisfactory progress in the course of study the student is pursuing, according to the standards and practices of the institution at which the student is in attendance." Federal regulations of May 1982 state that each institution shall establish, publish, and apply "reasonable standards" for assuring that every student receiving need-based financial aid should maintain "satisfactory progress in his/her course of study." Final Federal regulations, published October 6, 1983, state that "in order to receive student financial aid under the programs authorized by Title IV of the Higher Education Act, a student must be maintaining satisfactory progress in the course of study he or she is pursuing according to the standards and practices of the institution in which he or she is enrolled."

Satisfactory Academic Progress Requirements

The following requirements for satisfactory academic progress for receipt of financial aid apply to all applicants for any financial aid awards administered by the UCI Financial Aid Office. These requirements are separate and distinct from UCI's policy regarding satisfactory academic progress.

1. Grade Point Average (GPA)

All financial aid recipients must be in compliance with the following minimum cumulative GPA requirements at the conclusion of the spring quarter of each academic year.

Undergraduate students Year 1: 1.85; Year 2: 1.90; Year 3: 1.95; Year 4: 1.975; Year 5: 2.00

Graduate students 3.0
Medical students 2.0

2. Units (Undergraduate and Graduate) and Clock Hours (Medical Students)

All financial aid applicants must comply with the following minimum cumulative unit or clock-hour requirements.

Undergraduates:	Units/ Quarter	End of Year Total	Cumulative Total
Year			
1	8*	24	24
2	9*	27	51
3	12	36	87
4	15	45	132
5	16	48	180

Graduate Students:

Completion of at least 8 units per quarter.

Part-time Students:

Completion of at least 6 units per quarter.

Medical Students—Regular Curriculum Clock-Hours:

Year	End of Year Total	Cumulative Total
1	978	978
2	838	1,816
3	1,200	3,016
4	1,200	4,216

Medical Students—Extended Curriculum Clock-Hours:

Year	End of Year Total	Cumulative Total
1	489	489
2	489	978
3	838	1,816
4	1,200	3,016
5	1,200	4,216

*Information regarding enrolling for less than 12 units and the impact of that action on financial aid awards and payments is available from the Financial Aid Office.

NOTE: Students who enroll in more than the minimum number of units required per quarter in the first and second years will have the additional units carried forward for the cumulative total.

3. Quarter Limits for Eligibility

All financial aid applicants exceeding the following quarter limits will be ineligible for financial aid consideration.

Undergraduate students:

1. Entering freshmen are eligible for all types of financial aid for a total of 15 quarters of academic year attendance.
2. Advanced standing transfer students will have transcripts from previous postsecondary institutions evaluated to determine the number of remaining quarters of financial aid eligibility at UCI.
3. Students acquiring a second bachelor's degree will have up to six quarters of additional financial aid eligibility for a maximum of 21 quarters of undergraduate attendance.

NOTE: Students *will not* be granted additional quarters of eligibility solely by reason of changing their field of study or pursuing more than one major.

Graduate students:

1. Limited Status (California educational credential) students: four quarters of academic year attendance.
2. Limited Status (noncredential) students: four quarters of academic year attendance.
3. Master's degree designed for completion in:
 - a. three quarters: five quarters of academic year attendance.
 - b. six quarters: eight quarters of academic year attendance.
 - c. nine quarters: eleven quarters of academic year attendance.

4. Ph.D. students will be eligible for 21 quarters of need-based financial aid following the completion of their baccalaureate degree.

NOTE: Students *will not* be granted additional quarters of eligibility solely by reason of changing their field of study or pursuing more than one major.

Medical students:

1. Incoming students in their first year of attendance will be eligible for financial assistance for a total of four years.
2. College of Medicine students who have been approved for Extended Curriculum will be eligible for financial assistance for a total of five years.
3. Advanced standing transfer students will have transcripts from previous postsecondary institutions evaluated to determine remaining quarter/quintiles of financial aid eligibility.

NOTE: Students *will not* be granted additional quarters of eligibility solely by reason of changing their field of study or pursuing more than one major.

Unit Evaluation

1. Remedial courses

Required remedial courses will count toward the undergraduate, graduate, and medical student minimum unit/clock-hour requirement of the satisfactory academic progress policy for financial aid.

2. Grade evaluation

As defined below, units for the following grades *will not* be counted toward meeting the minimum unit/clock-hour requirement.

Undergraduate and graduate students

F	Failure
I	Incomplete
NP	Not Pass
U	Unsatisfactory
W	Withdraw
NR	No grade reported
Repeat courses	Repeat of a D grade or higher; repeat of an advanced standing or high school course

Medical students

F	Failure
NR	No grade reported
Repeat courses	Repeat of a D grade or higher

3. Incomplete courses—medical students

Clock-hours for a grade of Incomplete (I) will be counted toward satisfactory academic progress for the quarter/quintile during which the student took the course. If the student fails to meet the requirements for removing the I and the I becomes a grade of F, the clock-hours for that course will be deleted retroactively from the student's satisfactory academic progress record.

4. Courses in progress—medical students

Clock-hours for courses in In Progress (IP) will be counted toward satisfactory academic progress during the first quarter/quintile of a course requiring more than two quarters/quintiles for completion. Should the student fail to receive a passing grade, after the course has been completed the clock-hours for that course will be deleted retroactively from the student's satisfactory academic progress record.

Deficiencies in Satisfactory Academic Progress and Their Effect on Receiving Financial Aid.

The requirements for undergraduate and graduate student satisfactory academic progress stated above are monitored each quarter and at the end of each academic year. Students who fail to maintain satisfactory academic progress will have their financial aid eligibility affected in the following manner.

1. Quarterly totals—unit and GPA

a. GPA total below the minimum cumulative GPA total: Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive financial aid funds for that academic year but the GPA deficiency must be cleared by the end of spring quarter or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the GPA deficiency. **Note:** GPA deficiencies must be cleared at a University of California campus.

b. Unit deficiencies:

- i. Enrolled in less than the minimum units required but at least six per quarter.

Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive financial aid funds for that academic year but the unit deficiency must be cleared by the end of spring quarter or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the unit deficiency.

- ii Enrolled in less than six units per quarter.

Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive campus-based financial aid funds for that academic year but the unit deficiency must be cleared by the end of spring quarter or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the unit deficiency. (See "Quarterly Unit Deficiency and Its Effect on Pell Grant and Cal Grant" below.)

2. Academic year totals—units and GPA

The Financial Aid Office will verify the cumulative totals for units and GPA after the conclusion of spring quarter. Students who have unit or GPA deficiencies will be required to make up the deficiency prior to receiving any financial aid funds, including funds that would also be used for payment of fees.

3. Quarter limits of eligibility

At the end of the quarter students will be notified by the Financial Aid Office if they are nearing the quarter limit of eligibility for financial aid. The notice will indicate how many quarters of eligibility remain. Students also will be notified when they have completed the maximum number of quarters of eligibility for financial aid.

Quarterly Unit Deficiency and Its Effect on Pell Grant and Cal Grant A and B Recipients

1. Pell Grant

Students receiving a Pell Grant must be enrolled in a minimum of 12 units each quarter. The Financial Aid Office will verify unit totals for all Pell Grant recipients at the conclusion of each quarter. The Pell Grant unit requirement *does not* provide a probationary period in which the student may make up the deficiency. Students who are

enrolled for less than 12 units at the conclusion of the quarter will have their Pell Grant award reduced as follows:

- 11.9-9.0 units will receive three-fourths of the Pell Grant
- 8.9-6.0 units will receive one-half of the Pell Grant
- 5.9-0.0 units will have their Pell Grant canceled

If the Pell Grant reduction is made due to a deficiency in the fall quarter, the spring quarter Pell Grant award will be reduced. If the Pell Grant reduction is made due to a deficiency in the winter or spring quarter, the student will be billed, approximately three weeks after the conclusion of the quarter, for the amount of the reduction.

2. Cal Grant A and Cal Grant B Fee Payments

Students must be enrolled in a minimum of six units during the quarter in order to remain eligible for the full amount of their Cal Grant Fee Payment Authorization. Students enrolled in less than six units should contact the California Student Aid Commission for a leave of absence from the Cal Grant program; request forms are available at the Financial Aid Office. Graduating seniors with less than six units left to graduate should contact the Commission for a possible exception to the unit requirement.

3. Cal Grant B — subsistence

In order to receive full Cal Grant B subsistence students must be enrolled in a minimum of 12 units each quarter. Subsistence checks are issued based on the number of units in which a student is enrolled through the fifteenth of each month. Units may not be averaged from one quarter to the next. Students enrolled in less than 12 units will have their Cal Grant B subsistence awards reduced as follows:

- 11.9-9.0 units will receive three-fourths of the subsistence payment
- 8.9-6.0 units will receive one-half of the subsistence payment
- 5.9-0.0 units will not receive subsistence payment

Satisfactory Academic Progress Appeals

After failure to maintain satisfactory academic progress, a student will be considered for financial aid only when one of the following conditions has been met:

- a. Sufficient units/clock-hours have been completed and/or the minimum cumulative GPA requirement has been satisfied.
- b. It is established through the financial aid appeals process that the student encountered some type of extenuating circumstances during the quarter(s) in question which hindered academic performance (i.e., prolonged hospitalization, death in the family).

Appeals Procedure

Students wishing to appeal must submit the UCI Financial Aid Appeals Request Form and a letter to the Financial Aid Office stating their reasons for failing to meet the unit, clock-hour, or GPA progress requirements, and whether or not they have solved their difficulties. Undergraduate and graduate students may seek the assistance of the University Ombudsman in the preparation of appeals. Medical students may seek the assistance of the Associate Dean, Medical Student Affairs in the preparation of appeals. They may also be required to submit a degree check, course plan, or letter from their dean.

Undergraduate Students — All relevant material will be presented to the Financial Aid Appeals Board (the Board is composed of Financial Aid professional staff). Once material has been reviewed, the Board will decide whether eligibility for

aid will be reinstated. In the event the Board decides not to accept an appeal, the student will be given the right to a personal interview with the Board. If the student decides to exercise this right, a final recommendation based upon the interview and written material will be made by the Board and forwarded to the Director of Financial Aid for a final decision.

Graduate Students — Appeals are reviewed by (1) the Graduate Advisor of the student's advanced degree program and (2) the Dean of Research and Graduate Studies, who will make the final recommendations to the Director of Financial Aid for a final decision.

Medical Students — All relevant materials will be presented to the Committee on Promotions and Honors. If the Committee, after consideration of the appeal, determines that the appeal should be approved, its decision will be forwarded to the Director of Financial Aid and aid will be reinstated. In the event the appeal is denied by the Committee, the student will be given the right to a personal interview with the Committee. The Committee will forward the final decision to the Director of Financial Aid for implementation.

Scholarships

Scholarships are awarded on the basis of academic ability, achievement, and promise. They do not require repayment. Although a few honorary scholarships are awarded on the basis of academic excellence alone, many also require that an applicant demonstrate financial need. UCI offers students with proven high academic achievement and leadership potential five top honors awards: Regents', University, Chancellor's Club, Alumni Association, or UCI Foundation Scholarships.

Entering Freshman and Transfer Students

Students who are entering UCI in the fall must complete the scholarship section of the UC Application Packet and the application must be submitted by November 30. The Financial Aid Office automatically collects information about applicants' scholarship qualifications. Applications that meet the requirements are reviewed by the Faculty Committee on Undergraduate Scholarships, Honors, and Financial Aid and an Alumni Association Committee.

Continuing UCI Students

Academic records of all current UCI students also are reviewed. Continuing students who meet the qualification requirements are invited to apply. Applications are reviewed by the Faculty Committee on Undergraduate Scholarships, Honors, and Financial Aid and an Alumni Association Committee.

The scholarships have stipends which range from \$250 to \$1,500, or, in the case of Regents' Scholarships, provide full demonstrated need.

Restrictive Endowment Scholarships

All UCI students may apply for Restrictive Endowment Scholarships. Entering students should complete the scholarship application form which is included in the UC Application Packet. Continuing UCI students should complete the application form available in the Financial Aid Office. Eligibility requirements for these scholarships vary greatly and are restricted in terms of such student characteristics as geographic location, family background, and physical disabilities. For the most part, these scholarship awards are based on the student's established financial need.

Regents' Scholarships

Regents' scholarships, among the highest honors conferred upon UC students, are awarded on the basis of academic

excellence and exceptional promise, without reference to financial need. Undergraduate students are eligible upon graduation from high school or upon completion of the sophomore year of college. Medical students are eligible during any year of their study in medical school. The appointments range from four years for students entering from high school and first-year medical students, to two years for undergraduate students appointed after their sophomore year. Regents' Scholars receive a \$500 honorarium for each year of their appointment. In addition, a stipend is awarded annually to Regents' Scholars who complete the financial aid application process and demonstrate financial need. The amount of the stipend is equivalent to their demonstrated need.

University Scholarships

University scholarships are offered to students entering their freshman or junior year who show evidence of high scholastic attainment. Students who demonstrate financial need may receive stipends ranging up to \$1,200 per academic year. These stipends may be renewed by completing the application process and demonstrating financial need.

National Merit Scholarships

UCI is a sponsor of the National Merit Scholarship. Recipients are selected from a list of finalists who selected UCI as their first college choice on the National Merit Scholarship Application. Annual awards for attendance at UCI are \$300. In addition, UCI National Merit Scholars who have demonstrated financial need will be considered for scholarships up to \$2,000 per academic year.

For information on ROTC scholarships, see pages 60 and 61.

Grants

Grants are awarded on the basis of financial need. There is no repayment requirement.

Pell Grant is the largest federally funded grant program and provided up to a maximum of \$2,100 for the 1988-89 academic year. To be eligible, applicants must be U.S. citizens or eligible noncitizens, be enrolled as undergraduates, have not previously received a bachelor's degree, and demonstrate financial need. Students must use the SAAC or the Application for Federal Student Aid to apply for this grant.

Cal Grant A is a State-funded scholarship program which currently provides awards to be applied to the payment of University fees. In 1988-89 Cal Grant A awards were as much as \$1,074 for the academic year. To be eligible, applicants must be California residents and demonstrate financial need. Students must use the SAAC to apply for Cal Grant A. The filing deadline for new applicants is March 2 for the following year.

Cal Grant B is a State-funded grant program which provides awards up to a maximum of \$1,410 during the student's first year and \$1,410 plus \$1,074 for fees during subsequent years. To be eligible, applicants must be California residents, demonstrate financial need, and be entering college or not have completed more than one quarter of college work. Students must use the SAAC to apply for Cal Grant B. The filing deadline for new applicants is March 2 for the following year. *NOTE: Students may not receive both Cal Grant A and Cal Grant B. If offered both, the Financial Aid Office recommends taking Cal Grant B over Cal Grant A.*

Supplemental Educational Opportunity Grant (SEOG) provides grant aid for U.S. citizens and eligible noncitizens who are undergraduate students and have demonstrated financial need. These federal grants range from \$100 to \$4,000 per year, depending upon financial need.

UC Grant-In-Aid (GIA) is funded by the University of California and provides grant aid for full-time students who demonstrate financial need. The amount awarded depends upon financial need.

Loans

Loans are often part of a financial aid award. They provide recipients with an opportunity to defer the cost of their education by borrowing when needed and paying later. However, loan recipients must pay interest on the amount borrowed; interest rates vary from 5 to 12 percent per year. The deferment and cancellation provisions for the loans listed below are contained on the promissory note each recipient must sign and also may be obtained from the Financial Aid Office or lender.

A student's loan responsibilities, prior to acceptance of the loan, are to understand the terms of the loan and participate in an entrance interview. After accepting the loan, the recipient must repay the loan in accordance with the repayment schedule, advise the Financial Services Office upon leaving UCI; participate in an exit interview; and provide the Financial Services Office with a current address after leaving UCI. In case of death or total disability, outstanding loan obligations may be canceled upon presentation of official confirming documents.

Perkins Loan (formerly National Direct Student Loan) provides long-term federal loans for U.S. citizens and eligible noncitizens. The amounts awarded vary, depending on financial need, but cannot exceed \$4,500 for the first two years or \$9,000 for the undergraduate years. No interest is charged nor is repayment required while the borrower is enrolled in at least one half of the normal academic load. Interest of five percent a year begins nine months after the borrower ceases to be enrolled or is enrolled less than half time, and repayment must be completed within a 10-year period. Graduate students may receive an aggregate of \$18,000 which includes loans received as an undergraduate.

University Loan, funded by the University of California, provides long-term loans to full-time students who demonstrate financial need. The maximum amount for an academic year is \$3,000. Interest of five percent a year begins six months after the student ceases to be enrolled full time, and repayment must be completed within five years. Two cosigners are required.

Stafford Loan (formerly Guaranteed Student Loan), processed through participating banks and other lending institutions, is available to undergraduate, graduate, and medical students who are U.S. citizens or eligible noncitizens, and who demonstrate financial need. In addition to filing a SAAC to determine financial need, students need to file a separate State Stafford Loan application. They will be notified of their eligibility for a loan on their Award Letter and the Financial Aid Office will mail them a Stafford Loan application. Freshmen and sophomores may be awarded up to \$2,625 each academic year; juniors and seniors may be awarded up to \$4,000 each academic year; graduate and medical students may be awarded up to \$7,500 each academic year. Students must advance a grade level during the academic year or be subject to an 11-month waiting period before becoming eligible to apply for another Stafford Loan. The lending institution will deduct both a guarantee and origination fee from the amount of the loan prior to issuing the check.

Interest rates:

1989-90 borrowers	8 percent
Repeat borrowers —	
Loans after September 1983	8 percent

Loans from January 1980-September 1983	9 percent
Loans before January 1980	7 percent
Cumulative maximums:	
Undergraduate	\$17,250
Graduate and Medical students	\$54,750
(includes undergraduate loans)	
Deferment period before repayment: Six months after ceasing to be enrolled at least half-time	
Full repayment: Up to 10 years	
Minimum payment: \$50 per month	

The Financial Aid Office has a list of participating banks, savings and loan associations, and credit unions and their requirements and/or restrictions.

A minimum repayment of \$50 per month begins after the student ceases to be enrolled at least half time. The entire loan must be repaid in 15 years. Both a Guarantee and Origination Fee will be deducted by the lender from the loan amount.

These loans are made by banks, savings and loan associations, credit unions, and other lending institutions. The Financial Aid Office can provide a list of participating lenders and their requirements and/or restrictions.

Parental Loans for Undergraduate Students (PLUS) are designed to assist parents of dependent undergraduate students who are unable to demonstrate financial need for campus-based funds. Parents may be eligible to borrow up to \$4,000 each academic year on behalf of a student. The loan amount may not exceed the net cost of a student's education for the academic year.

Interest rate: Based on a 52-week Treasury Bill plus 3.25 percent, not to exceed 12 percent (Current rate 10.3 percent)
Cumulative Maximum: \$20,000 not to include the amount the student has borrowed under the Stafford Loan or SLS program

Deferment period before repayment: 60 days from day of check disbursement

Minimum payment: \$67 on a five-year repayment
Full repayment: Up to 10 years

Supplemental Loan to Students (SLS) assists independent students who are unable to demonstrate financial need for campus-based funds. Students may be eligible to borrow up to \$4,000 each academic year. Undergraduate, graduate, or medical students who continue to remain enrolled full time immediately enter the student deferment status. The repayment period begins immediately, however, if a student drops below full-time status, withdraws, or graduates. SLS borrowers are responsible for payment of all interest that accrues during in-school, deferment, and repayment periods.

Interest rate: Based on a 52-week Treasury Bill plus 3.25 percent, not to exceed 12 percent (Current rate 10.3 percent)
Cumulative Maximum: \$20,000 not to include the amount the student's parent has borrowed under the PLUS program

Deferment period before repayment: Immediately after the student ceases to be enrolled full-time, withdraws, or graduates

Minimum payment: Based on the repayment option the student chooses, approximately \$67 on a five-year repayment
Full repayment: Up to 10 years

Health Education Assistance Loan (HEAL) provides educational loans to medical students. Applicants must be U.S. citizens or permanent residents who are enrolled in or have been accepted for enrollment to the College of Medicine. Applicants must be full-time students in good academic

standing. A student may borrow up to \$20,000 per year. The cumulative maximum is \$80,000. The interest rate is tied to 91-day Treasury bills plus 3.5 percent and begins at the time the student signs the promissory note. Repayment of the principal plus interest begins 10 months after completion of professional training, including internships and residencies, and must be completed within 10 years. Applications are available at the College of Medicine Financial Aid Office.

Health Professional Student Loan (HPSL) provides long-term federal loans to medical students. Applicants must be U.S. citizens or permanent residents. The amount of the loan must not exceed the cost of fees plus \$2,500 per academic year or the amount of the student's actual financial need, whichever is less. The interest rate is five percent. Loan repayment begins after a student has completed professional training, including internships and residencies, and must be completed within 10 years.

Emergency loans are made from an emergency student loan fund made possible through various philanthropic individuals and organizations. Undergraduate and graduate students who have experienced unanticipated financial problems of a temporary nature may borrow up to \$100 without interest or service charge. Medical students may borrow up to \$300. During fall quarter only, students may have an emergency loan processed for the amount of their fees. Emergency loans must be repaid within 30 days after disbursement or by the end of the academic quarter, whichever occurs first. Applications are available in the Financial Aid Office or at the Medical School Financial Aid Office. This loan is not based on demonstrated financial need.

Work-Study

The work-study program offers eligible students who demonstrate need an opportunity to pay for their living and educational expenses as they occur. It also helps them to avoid a large debt that will have to be repaid after leaving school. Both undergraduate and graduate students are eligible for work-study awards. Medical students must obtain the approval of the Associate Dean for Medical Student Affairs prior to obtaining work-study employment. Students awarded work-study have the choice of obtaining a work-study job either on campus or off campus at a nonprofit agency. A variety of work opportunities are available, and such part-time work experience can be a valuable asset when seeking employment after graduation. Information about the terms and conditions of work-study employment will be provided in the UCI Financial Aid Award Guide sent to all UCI students receiving financial aid.

Veterans Work-Study Program is available only to U.S. military veterans and their eligible dependents. Separate applications and detailed information are available from the UCI Veterans Student Services Office.

Additional Aid for Graduate and Medical Students

Most graduate fellowship programs are administered by the Office of Research and Graduate Studies. Graduate students should contact the Office, 145 Administration Building; telephone (714) 856-6761, for information about application procedures for other forms of aid such as graduate fellowships or teaching and research assistantships.

College of Medicine students should contact the Medical Student Financial Aid Coordinator, 125 Medical Surge I, College of Medicine; telephone (714) 856-6476, for information about other sources of financial assistance.

Aid for International Students

Students who are not U.S. citizens or permanent residents of the United States, and have experienced an unanticipated change in their financial situation, may be eligible for assistance from a very limited number of University programs. The financial change must be fully documented. In order to be considered for financial aid, students must have completed at least three years of study at UCI as undergraduates or four years of study as graduate students. Financial aid is limited to the expenses for books and fees; tuition will not be considered. International students may contact the Financial Aid Office or the Office of International Services for further information.

Aid for Disabled Students

All forms of student financial aid are available to eligible disabled students. Interested students should follow the regular financial aid application procedures and should be sure to specify on the Student Aid Application for California any additional expenses they may incur because of a disability. Supporting documentation must be provided.

Student Employment

The Career Planning and Placement Center assists UCI students and their spouses in obtaining part- or full-time employment during the academic year and summer vacation. Financial aid recipients who have been awarded work-study also may obtain on-campus or off-campus job referrals in the Career Planning and Placement Center. The Center is located in Student Services I.

Undergraduate Admissions

The Office of Admissions welcomes inquiries on any aspect of becoming eligible for the University of California and on planning for transfer. Admissions counselors are available by appointment in 245 Administration Building, and inquiries may be addressed to the Office of Admissions, University of California, Irvine; Irvine, California 92717. General admission information is available by telephoning (714) 856-6703.

The information on admission to UCI given below is organized as follows:

- Categories of Application
- Admission Requirements
- Admission as a Freshman Applicant
- Admission as a Transfer Applicant
- Nonresident Admission Requirements
- Admission of International Students
- Application Procedures
- Additional Information

Categories of Application

An **undergraduate** applicant is a student who wishes to complete a program of studies leading to a Bachelor of Arts, Bachelor of Music, or Bachelor of Science degree.

A **freshman** applicant is a student who has graduated from high school or has completed a California Certificate of Proficiency, an equivalent proficiency examination from another state, or the General Educational Development (GED) Certificate, but has not enrolled in a regular session of any collegiate-level institution. Summer sessions immediately following graduation are excluded in the determination of freshman status.

A **transfer** applicant is a student who has completed high school and who has been a registered student in a regular or extension session of a college or university other than a

summer session immediately following high school graduation.

An **intercampus transfer** applicant is an undergraduate student who is currently or was previously registered in a regular session at another campus of the University of California and has not been registered in another collegiate institution. See page 58.

A **nonresident** applicant is a student whose legal permanent residence (as determined by the University) is outside of the State of California. Nonresident applicants are generally required to pay Nonresident Tuition and must also present a higher grade point average than is required of California residents. Refer to the Nonresident Admission Requirements section for further information.

An applicant for **readmission** is a student who was formerly registered and enrolled on the Irvine campus and who has interrupted the completion of consecutive quarters of enrollment. See page 58.

A **second baccalaureate** applicant is a college graduate who because of a change of objective wishes to obtain a second bachelor's degree in a major different from that of the first degree.

An **international** applicant is a student who holds or expects to hold a student, exchange, visitor, or diplomatic visa and who wishes to attend school in the United States.

A **University Program for High School Scholars (UPHSS)** applicant is an accelerated high school student who wishes to pursue a particular subject beyond the level offered by the high school or perhaps an area of interest not offered by the high school in which the student meets the necessary prerequisites. Participants enroll in one or two UCI courses on a reduced-fee basis concurrently with high school courses. See page 15 for additional information.

Admission Requirements for California Residents

The University's undergraduate admission requirements are based upon two principles: (1) that the best assurance of success in the University is provided by a high quality of academic achievement in previous work; and (2) that the study of certain subjects will give the student both good preparation for study in the University and reasonable freedom in choosing a field of specialization. In addition to the high school subjects required for admission to the University, certain preparatory subjects are recommended for many University curricula to give students adequate background for their chosen field of study.

The admission requirements summarized on the following pages are the *minimum* needed to be considered eligible for admission to UCI and other campuses of the University of California. Some campuses and programs are highly competitive and can accept only a limited number of students each year; completing the required high school courses with satisfactory grades may not automatically determine that a student will be selected for admission.

UCI receives many more qualified applications than can be accommodated. All freshman applications are screened beyond the minimum UC eligibility requirements. Selection for admission is based upon indices derived from correlations among high school grades, test scores, and grade averages earned by past UCI students. A number of other applicants who exceed the basic UC requirements are selected upon individual review by UCI faculty and admissions staff. Con-

sideration is given to such factors as the rigor of course work taken; accomplishment in areas relevant to academic aims; evidence of exceptional motivation, diligence, and creativity; match between UCI's offerings and the applicant's objectives; academic preparation; talents; and potential for contributing to the campus community. It is anticipated that similar screening procedures will be applied to applicants for the 1989-90 academic year. Additional information on selection screening can be found in *Introducing the University of California*, a publication available from the Office of Admissions, the Office of Relations with Schools and Colleges, and in many California high school counselors offices.

Admission to Freshman Standing

The University defines a freshman applicant as a student who has graduated from high school or completed a California Certificate of Proficiency or the equivalent and who has not enrolled in a regular session of any collegiate-level institution. Summer sessions are excluded in the determination.

Freshman applicants who are not residents of California should refer ahead to the section on Nonresident Admission Requirements.

Freshmen applicants who have not yet decided on a major should refer to the section on Planning an Undergraduate Program.

Applicants who do not meet the scholarship requirements for admission or do not qualify by examination at the time of high school graduation may be admitted after they meet the requirements for admission in advanced standing (see p. 39). Transfer credit will be granted for an acceptable course from an accredited college or university taken while still in high school if completed after the tenth grade and if reported on a valid transcript issued by the college or community college which conducted the course.

Requirements

To be eligible for admission to the University as a freshman, an applicant must meet the Subject, Scholarship, and Examination requirements. It is also possible to qualify for admission by examination alone, as explained in the section Admission by Examination Alone.

1. UC Subject Requirement

The UC subject requirement consists of several courses from six core subjects. These required courses are called the "a through f" subjects. Students are required to complete 15 "a through f" subjects as described below. (A one-year course is equal to one unit; a one-semester course is equal to one-half unit.) Also, at least seven of the 15 units must have been earned in courses taken during the last two years of high school. To meet the subject requirement, these courses must appear on a certified course list which is available in the high schools for California applicants. The Office of Admissions will review and accept courses that meet the requirements for applicants graduating from out-of-State schools.

Specific "A through F" course requirements

a. History: 1 year One year of United States history or one-half year of United States history and one-half year of civics or American government

b. English: 4 years Four years of college-preparatory English composition and literature

(All English courses must require frequent and regular practice in writing expository prose compositions of some length. Only two semesters of a certified English-as-a-second-language (ESL) course will be accepted. Also, not more than

two semesters of ninth grade English will be accepted for this requirement.)

c. Mathematics: 3 years Three years of mathematics elementary algebra, geometry, and advanced (second-year) algebra (Mathematics courses taken in grades 7 and 8 may be used to meet part of this requirement if they are accepted by the high school as equivalent to its own courses.)

d. Laboratory Science: 1 year A one-year course in one laboratory science, taken in the tenth grade or later

e. Foreign Language: 2 years Two years of one foreign language in courses that provide instruction in grammar, vocabulary, reading, and composition, and that emphasize the development of aural and oral skills

(Foreign language courses taken in grades 7 and 8 may be used to meet this requirement if they are accepted by the high school as equivalent to its own courses.)

f. College-Preparatory Electives: 4 years These units are to be chosen from at least two of the following subject areas: history, English, advanced mathematics, laboratory science, foreign language, social science, and visual and performing arts. Students are urged to consult their high school counselor in the selection of course work to fulfill this requirement.

The general objective of the elective program is to improve the student's analytical ability, promote their artistic development, and strengthen their oral and writing skills. Electives should involve considerable reading and writing in an amount appropriate to the course and the subject matter. The emphasis in elective courses should be to prepare for future college-level work.

Courses satisfying the "f" requirement:

History: All history courses should require extensive reading and writing. Courses should enable students to establish a breadth of understanding of history (for example, world history, political history, or economic history) and should provide an understanding of the human past, including its relation to the present. Courses should develop a student's critical thinking, ability to evaluate historical data, and ability to analyze and synthesize evidence.

English: All English courses should require substantial reading with frequent and extensive practice in writing which is carefully evaluated and criticized. A course in journalism, speech, debate, or drama is acceptable if it meets the rigor in reading and writing stated above.

Advanced Mathematics: Courses in mathematics with second-year algebra as a prerequisite such as trigonometry, linear algebra, precalculus (analytic geometry and mathematical analysis), calculus, probability, and statistics are acceptable electives.

A computer science course is an acceptable mathematics elective if it fulfills the following objectives. The course should enable each student to express algorithms in a standard computer language such as Pascal, BASIC, FORTRAN, or COBOL. By the end of the course each student should complete substantial programming projects in the language used. The course should also involve the study and mastery of various aspects of computer science: how computers deal with data and instructions, the internal components of a computer, and the underlying computer logic.

Laboratory Science: A laboratory science course should be a course in the biological or physical sciences in which students make their own observations and measurements and analyze

these data to obtain further information. On average the laboratory activities should involve an amount of time equivalent to at least one full class period per week.

A science course in the ninth grade is an acceptable science elective provided it is designed to prepare students for laboratory science courses in the tenth grade and beyond. The course must provide an introduction to the fundamental principles of physical and biological science. Laboratory activities as defined above shall be included. (A terminal course designed only to meet graduation requirements is not an acceptable science elective.)

Foreign Language: It is recommended that elective courses be in the same language used to satisfy the foreign language "e" subject requirement. Elective courses in this language must have at least two years of the language as prerequisite. In order for a second language to qualify as an elective, at least two years of this language must be completed.

Social Science: Courses should be in one of the social sciences: anthropology, economics, geography, political science, psychology, or sociology, or, alternatively, courses should be interdisciplinary, drawing knowledge from two or more of these fields. Course objectives should include as many of the following as are applicable to the field: (1) to understand the development and basic features of major societies and cultures, (2) to examine the historic and contemporary ideas that have shaped the world, (3) to understand the fundamentals of how differing political and economic systems function, (4) to examine the nature and principles of individual and group behavior, and (5) to study social science methodologies.

In order to develop a student's critical thinking, ability to evaluate ideas and information, and ability to analyze and synthesize qualitative and quantitative evidence in the laboratory and in the field, a social science course must include a body of basic knowledge, extensive reading, and written and oral exposition.

Courses which are designed to meet State-mandated social studies graduation requirements are acceptable provided that they meet the above criteria. Courses of an applied, service, or vocational character are not acceptable social science electives.

Visual and Performing Arts: Courses in this area consist of instruction in dance, drama/theatre, music, and the visual arts. Courses should give specific attention to as many of the fundamental arts components as possible, including the perceptual, the creative, the historical, or the critical as are applicable.

Courses should enable students to understand and appreciate artistic expression and, where appropriate, to talk and write with discrimination about the artistic material studied.

Courses devoted to developing creative artistic ability and those devoted to artistic performance should have prerequisites (either course work or experience approved by the instructor) and should assume proficiency beyond the introductory level.

Courses must require on average the equivalent of a five-period class per week. Work outside of class must be required; for example, portfolio/performance preparation, reading, writing, or critical listening/viewing.

Dance courses offered for physical education credit or under any other departmental arrangement are acceptable provided they include content satisfying the above criteria.

Courses which are primarily recreational, athletic, or body conditioning are not acceptable visual and performing arts electives.

2. Scholarship Requirement

Applicants who attain a minimum grade point average of 3.30 (where the letter grade A = 4, B = 3, and C = 2) in "a through f" subjects taken after the ninth grade will be considered eligible for admission to the University regardless of their scores on the standardized tests used for the examination requirement. Applicants whose grade point average is below 3.30 but greater than 2.77 are eligible to be considered for admission if they achieve the composite or total test score specified on the Eligibility Index (see page 39). The grade point average will be based on semester grades, unless a high school gives only year grades. (Grades earned in ninth grade or earlier are not used to calculate the grade point average for admission; however, these courses will be used to meet the subject requirement if they are completed with grades of C or better.) As noted on page 36, freshman applicants may be required to present academic qualifications beyond those described here.

Applicants should have earned grades of C or better in meeting the subject requirement. Any "a through f" course in which a student received a D or F grade must be repeated with a higher grade or, in sequential areas of mathematics, chemistry, and foreign language, *only* validated by completion of advanced course work. (Applicants should consult with their counselors as to how these grades can be remedied and how the University will use them in the evaluation of the high school record.)

- a. **Mathematics Requirement** With regard to the "c" subject requirement, grades earned in the third year of mathematics (advanced algebra) will be used only if they improve the student's grade point average.
- b. **College-Preparatory Elective Courses** Two of the four units in elective courses used to satisfy the "f" requirement must be completed with a grade of C or better, and all four units must be accepted by the high school for graduation. The best grades earned in any two of these units taken in grades 10 through 12 will be used in computing the applicant's grade point average for admission.
- c. **Honors-Level Courses** The University wants to encourage students to take demanding, advanced academic courses in high school. Grades earned in up to four units of work in courses that are (a) certified by the high school as offered at an honors level, and (b) taken in the last two years of high school will be given extra weight in computing the grade point average for admission. Grades in honors courses will be counted as follows: A = 5 points, B = 4 points, and C = 3 points.

To be counted, these grades must have been earned in University-approved honors-level courses in history, English, advanced mathematics, laboratory science, and foreign language. In these fields and additionally in the fields of computer science, social science, and the visual and performing arts, courses designed to prepare students for the Advanced Placement Examinations of the College Board are examples of honors-level courses.

3. Test Requirements

All freshman applicants must submit test scores as described below. Students applying for admission for fall quarter should complete their examination requirements during May or June of their junior year or during their senior year, but no later than the December test date. (Typically, this means that students will take either the Scholastic Aptitude Test or the American College Test in October or November and will take the Achievement Tests in November or December.)

Scores from any earlier dates will be accepted. Applicants must ensure that reports for all scores have been submitted directly to the UCI Office of Admissions. The following tests are required:

1. One Aptitude Test Either:

- a. The Scholastic Aptitude Test (SAT) (the verbal and mathematics scores submitted from this test must be from the same sitting); *or*
- b. The American College Test (ACT) composite score *and*

2. Three College Board Achievement Tests, which must include (a) English composition, (b) mathematics, level 1 or 2, and (c) one from among English literature, foreign languages, sciences, or social studies. The Achievement Test in Literature may not be substituted for the English composition test.

3. Admission by Examination Alone A student can qualify as a freshman by examination alone. The required total score on the SAT is 1,100. (If the ACT is presented, the minimum score is 26.) Also, the student's total score on the three College Board Achievement Tests must be 1,650 or higher, or at least 1,730 if a nonresident of California, with no score less than 500 on any individual Achievement Test. This option does not apply to students who will have completed more than 12 transferable units prior to admission. The College Board Achievement Tests cannot be taken in academic subjects covered by transferable college courses a student may have taken.

Eligibility Index

Applicants are admissible if their a-f grade average and test score totals are higher than the combinations below:

A-F	ACT* or SAT**		A-F	ACT* or SAT**	
GPA	Composite	Total	GPA	Composite	Total
2.78	35	1600	3.05	22	970
2.79	35	1580	3.06	21	950
2.80	34	1550	3.07	21	920
2.81	34	1530	3.08	20	900
2.82	33	1510	3.09	19	880
2.83	33	1480	3.10	18	850
2.84	33	1460	3.11	18	830
2.85	32	1440	3.12	17	810
2.86	32	1410	3.13	16	780
2.87	32	1390	3.14	15	760
2.88	31	1370	3.15	14	740
2.89	31	1340	3.16	14	710
2.90	30	1320	3.17	13	690
2.91	30	1300	3.18	12	670
2.92	29	1270	3.19	11	640
2.93	29	1250	3.20	10	620
2.94	28	1230	3.21	9	600
2.95	28	1200	3.22	9	570
2.96	27	1180	3.23	8	550
2.97	27	1160	3.24	8	530
2.98	26	1130	3.25	7	500
2.99	26	1110	3.26	7	480
3.00	25	1090	3.27	6	460
3.01	25	1060	3.28	6	430
3.02	24	1040	3.29	5	410
3.03	24	1020	3.30	5	400
3.04	23	990			

*ACT is scored in intervals of 1 point from a minimum of 1 to a maximum of 35.

**SAT is scored in intervals of 10 points from a minimum of 400 to a maximum of 1,600.

Admission to the University Program for High School Scholars (UPHSS)

The opportunity to enroll in University classes concurrent, usually, with the senior year of high school is available to certain accelerated students (see p. 36). Admission to UPHSS is based upon a combination of criteria including grades, specific preparation in the field of interest, standardized test scores, recommendations, and statement of purpose.

Through UPHSS, qualified high school students may enroll in UCI courses, receive grades based on the same standards as full-time students, and receive full University of California credit for their work.

To continue at UCI after high school graduation, a UPHSS student need only complete a change-of-major petition and enroll as a full-time student. If the UPHSS participant wishes to attend another University of California campus, the student must follow the regular admissions process and must complete an Undergraduate Application form. The form should be stamped by the UPHSS coordinator. High school students wishing more information about the program should contact the Office of Admissions or their high school counselor.

Admission as a Transfer Applicant

The University defines a transfer applicant as a student who has completed high school and who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard the college record and apply for admission as a freshman.

Some majors have additional admissions requirements. For fall 1989 admissions, applicants to Economics, Engineering, and Information and Computer Science were subject to screening beyond the minimum admission requirements for transfer students, as noted below and in the section for each major. Applicants to these majors may also be subject to additional screening in 1990-91.

Economics: Applicants with highest grades in the following courses received preference: one-year lower division sequence in microeconomics and macroeconomic theory; calculus; and writing.

Engineering: Applicants must have completed prerequisites in calculus, FORTRAN, physics, chemistry, and writing. Selection was by GPA within each of the Engineering options—Civil, Electrical, and Mechanical.

Information and Computer Science: Junior-level applicants who have completed the majority of UCI's breadth requirement, or who have completed the Transfer Core Curriculum in full, and who have the highest grades in the following courses received preference: mathematics (two years); programming (one year in a high-level language); writing prerequisites.

Transfer applicants who are not residents of California should refer to the section on Nonresident Admission Requirements.

Transfer Student Admission Requirements

The requirements for admission as a transfer applicant vary according to the high school record. Transfer applicants who have completed a California Certificate of Proficiency or the equivalent must also meet regular University entrance requirements.

The transcript submitted from the last college attended must show, as a minimum, that the student was in good standing and had earned a grade point average¹ of 2.00 or better. If the grade point average fell below 2.00 at any one college attended, except the last one attended, the student must have sufficient additional units and grades to offset the deficit.

A transfer applicant must also meet **one** of the following conditions:

1. A student who met the Eligibility Index and completed all the "a through f" courses in high school may be admitted any time after establishing an overall grade point average of 2.00 or better. If a student has completed less than 12 quarter or semester units of transferable college credit since high school graduation, the student must also satisfy the examination requirement for freshmen.
2. A student who met the Eligibility Index but had not studied one or more of the required courses in high school may be admitted after the student has:
 - a. established an overall grade point average of 2.00 or better in another college or university; and
 - b. completed, with a grade of C or better, appropriate college courses in the high school subjects lacked; and
 - c. completed 12 or more quarter or semester transferable units, or met the examination requirement for freshmen.
3. A student who was not eligible for admission as a freshman because the Eligibility Index was not met or who both failed to meet the Eligibility Index and lacked required subjects may be admitted after the student has:
 - a. established an overall grade point average of 2.40 or better in another college or university; and
 - b. completed 84 quarter units (56 semester units) of college credit in courses accepted by the University for transfer; and
 - c. completed *one* of the following two options:
 - i. With a grade of C or better, (1) one transferable course in English; (2) one transferable course selected from U.S. history, a laboratory science, or a foreign language; (3) courses equivalent to high school elementary algebra, advanced algebra, and geometry; *or* a course in mathematics, such as trigonometry, or statistics for which advanced algebra is a prerequisite. The mathematics courses do not have to be transferable.
 - ii. Appropriate college courses, with grades of C or better in the "a through f" subjects that the student lacked. Up to two units of high school work in "a through f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements of four years of college-preparatory English and three years of mathematics (part of the "a through f" requirements).

Transfer applicants are referred to Planning to Transfer, page 46.

¹The grade point average is determined by dividing the total number of acceptable units attempted into the number of grade points earned on those units. A student may repeat courses completed with a grade lower than C up to a maximum of 16 quarter units without penalty.

The scholarship standard is expressed by a system of grade points and grade point averages earned in courses accepted by the University for advanced standing credit. Grade points are assigned as follows: for each unit of A, 4 points; B, 3 points; C, 2 points; D, 1 point; I and F, no points; P/NP, no points but are included in the unit total.

Admission for a Second Bachelor's Degree

A student whose educational objective has changed substantially after receiving the bachelor's degree may be considered for admission to a program for a second degree. Admission as a candidate for a second bachelor's degree requires that the applicant be fully eligible for admission to the University and have strong promise of academic success in the new major. All such admissions are subject to the approval of the dean or director of the UCI school or program in which the second degree will be earned.

Students who have *not* attended UCI as undergraduates during a regular academic quarter should complete an Application for Undergraduate Admission *and* a Supplementary Information for Second Baccalaureate Applicants form, available from the Office of Admissions. Students who have attended UCI as undergraduates during a regular academic quarter should obtain and complete a Second Baccalaureate Application form through the Registrar's Office.

Nonresident Admission Requirements:

NOTE: Admission requirements for applicants who are not California residents vary slightly from requirements for California residents.

Nonresident Freshman Applicant

A nonresident freshman applicant must (1) graduate from a regionally or state-accredited high school, or complete an appropriate proficiency examination (see p. 42); (2) complete satisfactorily the "a through f" pattern of subject requirements listed under requirements for California residents; (3) earn a grade point average of at least 3.40 or higher in the required high school subjects (3.00 is equal to a B average); and (4) meet the examination requirement: one Aptitude Test either the Scholastic Aptitude Test (SAT) (verbal and mathematics scores must be from the same sitting) or the American College Test (ACT) composite score and three College Board Achievement Tests which must include (a) English composition, (b) mathematics, level 1 or 2, and (c) one from among English literature, foreign languages, sciences, or social studies. (The Achievement Test in Literature may not be substituted for the English composition test.)

Please note that the Freshman Eligibility Index applies to California residents only. To be considered for admission by examination alone, a nonresident applicant must score either 1,100 on the Scholastic Aptitude Test or 26 on the American College Test. The total score on the three College Board Achievement Tests must be 1,730 or higher with a score of at least 500 on each test.

Nonresident Transfer Applicant

A student who met the admission requirements for freshman admission as a nonresident must have a grade point average of 2.80 or higher in college courses that are accepted by the University for transfer credit.

A nonresident applicant who graduated from high school with less than a 3.40 grade point average in the subjects required for freshman admission must have completed at least 84 quarter units (56 semester units) of transferable work with a grade point average of 2.80 or higher. Upon successful completion of that work, two units of the required high school subjects may be waived but transfer applicants must have satisfied the freshman entrance requirements of four years of college-preparatory English and three years of mathematics (part of the "a through f" requirements). A student who lacked any of the required subjects in high school

must complete, with a grade of C or better, appropriate college courses in those subjects, *or*, with a grade of C or better, (1) one transferable course in English; (2) one transferable course selected from U.S. history, a laboratory science, or a foreign language; (3) courses equivalent to high school elementary algebra, advanced algebra, and geometry; *or* a course in mathematics, such as trigonometry or statistics, for which advanced algebra is a prerequisite. The mathematics courses do not have to be transferable.

Exceptions to Nonresident Admission Requirements

For admission purposes only, a person residing outside of California may be determined by the Office of Admissions to be a bona fide resident and may be considered under California resident admission requirements if the applicant: is a spouse of a University of California faculty member; is a spouse of military personnel assigned to California; is a military dependent who has been granted a nonresident fee waiver; is an immigrant who has lived in California for a year and has chosen California as a place of residence; is a minor applicant whose parent or legal guardian appears to be a legal resident of California (as determined by the University for tuition purposes); has spent any two years or the last term enrolled in a California high school; has spent the last term (in at least 12 transferable units) enrolled in an accredited California college or university; has been physically present in California continuously for at least one year prior to the quarter for which registration is requested; or if one parent has received a degree from the University of California or is a full-time employee of the University of California.

Nonresident Tuition Fee

Refer to page 28 for information regarding residence classification for tuition purposes and the Nonresident Tuition Fee. Bona fide residents are still held for Nonresident Tuition.

Admission of International Students

The credentials of an international undergraduate applicant—a student who holds or expects to hold a student, exchange, visitor, or diplomatic visa and who wishes to attend school in the United States are evaluated in accordance with the general regulations governing admission. However, it is possible that international applicants to oversubscribed programs may not be offered admission to either their first-choice campus or to another University of California campus. The application should be submitted to the University of California Undergraduate Application Processing Service early in the appropriate application filing period. Official certificates and detailed transcripts of records should be submitted directly to the UCI Office of Admissions. This will allow time for exchange of necessary correspondence and, if the applicant is admitted, will help the student in obtaining the necessary passport visa.

International applicants whose native language is other than English will be required to demonstrate their English proficiency. This is most often accomplished by achieving a minimum score of 550 on the Test of English as a Foreign Language (TOEFL). The admission of otherwise eligible applicants who do not meet this requirement will be deferred until it is possible for them to demonstrate an adequate level of English ability. Arrangements to take the TOEFL may be made by writing directly to TOEFL, Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540. Students must request the Educational Testing Service to forward results of their tests to the Office of Admissions. Completion of an *acceptable* English composition course (as determined by the Office of Admissions) with a grade of C or better will

also clear the English proficiency requirement for international applicants.

Prospective students who wish to improve their English proficiency to meet the TOEFL requirement may enroll in the intensive Program in English as a Second Language sponsored by University Extension. Requests for information should be addressed to Program in English as a Second Language, University of California Extension, P.O. Box AZ, Irvine, CA 92716. See page 60 for additional information.

In addition to achieving a minimum TOEFL score of 550, all international students must take an English as a Second Language Placement Test upon arrival and prior to registration. Based upon the results of this test, students may be required to improve certain language skills by enrolling in English as a Second Language courses during the freshman year with other major course work being adjusted accordingly.

Generally, financial assistance and scholarships from the University are not available to the nonimmigrant-visa student. International students must provide proof that sufficient funds will be available to meet their educational commitments while studying in the United States. International undergraduate students are considered as nonresidents of California and are required to pay the nonresident tuition in addition to fees paid by legal residents of California. Students must also pay the International Student Health Insurance Fee, or have private insurance. See the Student Health Service section for additional information.

Please direct all inquiries regarding the undergraduate admission of international students to the Office of Admissions.

English Language Proficiency of Permanent Resident, Refugee, and International (F-1 Visa) Students: English as a Second Language

Any student (a) whose first or native language is not English, (b) who has not satisfied the Universitywide Subject A requirement, *and* (c) whose score on the verbal portion of the Scholastic Aptitude Test (SAT) is 350 or less, or any such student without a verbal SAT score, *must*, regardless of the student's TOEFL (Test of English as a Foreign Language) score, take an English as a Second Language Placement Test prior to the first quarter of enrollment. The placement test is given prior to the beginning of each quarter, during Academic Advising and Orientation ("O") Week prior to the beginning of fall quarter instruction, and on dates to be announced. Information concerning when and where the test will be given and the test itself can be obtained from the Program of Academic Support Services Office (telephone 714-856-6206) and the Office of English as a Second Language (telephone 714-856-6781).

Based upon the results of the ESL Placement Test, students may be required to enroll in ESL courses prior to enrolling in any other required writing courses. Students required to enroll in ESL courses must begin satisfying their ESL requirements within their first or second quarter at UCI. They must take these courses in consecutive quarters. The ESL requirements are to be completed within the first six quarters at UCI. Students who have not satisfied the ESL requirement by the end of their sixth quarter will be ineligible to enroll for a seventh quarter at UCI. Subject A must be satisfied during the quarter following the completion of ESL requirements. If the ESL requirements are completed during the first quarter of enrollment, the Subject A requirement must be satisfied before the beginning of the fourth quarter of enrollment.

ESL courses, offered by the School of Humanities, include classes in writing, speaking and listening, and reading and vocabulary development. See page 166 for course descriptions.

Credit for English-as-a-Second-Language Course Work

Students whose first language is not English may receive up to 12 baccalaureate credits for English-as-a-second-language course work. Students may receive workload credit for courses taken beyond this 12-unit limit but will not receive additional credits applicable to the bachelor's degree.

Credit for Native Language

Students whose first language is not English may receive credit for course work in their native language and literature, provided such courses were completed on the college level in the country of the vernacular, *or* on the upper-division or graduate level at UCI or another accredited English-speaking institution.

Application Procedures

Application packets for undergraduate admission to the University are available from the counseling office of any California high school or community college, or from any University of California Admissions Office.

Students applying for admission to UCI should complete the application and submit it according to the instructions provided in the 1989-90 *Undergraduate Application Packet*. A non-refundable application fee of \$35 must accompany the application. This basic fee entitles the applicant to be considered at one campus; for *each* additional campus selected, an additional \$35 fee is required. Applicants concerned with admission or application procedure questions *specific to UCI* should communicate directly with the Office of Admissions, 245 Administration Building, University of California, Irvine; Irvine, CA 92717.

When to Apply for Admission

To ensure that applications will be considered for admission by both UCI (or other University campuses) and the student's choice of major or program of study, the completed application and the application fee should be filed during the priority filing period. Each campus accepts for consideration all applications it receives during this period. Early filing is encouraged for students who plan to apply also for financial aid, University housing, or other special programs. Additionally, students required to fulfill the examination requirements for freshman admission should make arrangements to take the standardized tests early. Completing the examination requirement (SAT or ACT and three Achievement Tests) no later than the December testing date of the senior year of high school is recommended.

Quarter to be Admitted at UCI

Winter quarter, 1990
Spring quarter, 1990
Fall quarter, 1990
Winter quarter, 1991
Spring quarter, 1991

Priority Application Filing Dates

File July 1-30, 1989
File October 1-30, 1989
File November 1-30, 1989
File July 1-30, 1990
File October 1-30, 1990

After the priority filing period has ended, campuses will accept applications only if they still have openings for new students. This means that some campuses may still be able to accept additional applications and others may not.

Adding a Campus

If the campus or campuses being considered are still accepting applications, students may, after submitting their application, add additional campus choice(s) to that or those initially listed on their application. A \$35 fee for each additional campus will be required. Students should contact the Admissions Office on the campus to be added for information on which programs are still open and the procedures for adding campuses.

Students should be aware that processing an additional campus choice will take several weeks before the new campus actually receives the application and data. Students should also be aware that special program commitments, such as the Educational Opportunity Program or UCLA's Academic Advancement Program may vary from campus to campus. At UCI, the Office of Admissions notifies the Financial Aid and Housing Office about a student's request for these services **after** the application is received and processed at UCI. Students can communicate with the Housing or Financial Aid Office directly for information about deadlines, priorities, and availability of these services.

Transcripts

The Office of Admissions requires complete, accurate, and up-to-date information about a student's academic program and work in progress in order to process and respond to the application in a timely manner. The transcript and other documents submitted as part of the application become the property of the University; they cannot be returned or forwarded in any form to another college or university.

Freshman Applicant. *Applicants will be notified if a preliminary high school transcript is required.* Applicants are also responsible for asking testing agencies to report examination scores for either the SAT or ACT tests and three Achievement Tests to the UCI Admissions Office. *An official final high school transcript showing a statement of graduation also must be forwarded to the campus at which the student has decided to register and enroll.* Official final transcripts should arrive in the UCI Office of Admissions by July 25, 1989 for those students admitted for fall quarter, 1989. Those students entering in the winter or spring quarters must have their transcripts in the Office of Admissions within one month of the completion of the quarter in which they entered. A California Certificate of Proficiency, the results from a proficiency test from any state, or a General Education Development (GED) Certificate can be accepted in place of a high school diploma.

Transfer Applicant. *Transfer applicants must request a transcript from each college attended, including, if possible, a listing of courses in progress from the student's current college. A transcript from the last high school attended also should be requested.* Attendance at any other school or college after an application to the University has been filed is considered to be part of the student's record and must be reported to the Office of Admissions.

Examination Arrangements

Students should make arrangements to take the required tests with the Educational Testing Service, College Board/ATP, P.O. Box 23470, Oakland, California 94623-0470, or College Board/ATP, CN 6200, Princeton, New Jersey 08541-6200, for SAT and Achievement Tests. For the ACT, students should write to the American College Testing Program Registration Unit, P.O. Box 168, Iowa City, Iowa 52240. (Test fees should be paid to the testing services, not to the University.) At the same time the test is taken, students should request that their scores be reported to the UCI Office of Admissions. To prevent confusion or unnecessary

delay, it is important to use precisely the same form of the student's name on both the application for admission and the test materials.

In 1989-90 SAT and Achievement Tests are offered concurrently on the following Saturday mornings:

October 14, 1989 (SAT only in California, Florida, Georgia, Hawaii, Illinois, North Carolina, South Carolina, and Texas)	January 27, 1990
November 4, 1989	March 31, 1990 (SAT only)
December 2, 1989	May 5, 1990
	June 2, 1990

The 1989-90 ACT Tests are offered on the following dates:

October 28, 1989	April 7, 1990
December 9, 1989	June 9, 1990
February 10, 1990	

Details on testing are available from the College Board, the American College Testing Program, and from most high school counseling offices.

Notification of Admission

Most fall quarter applicants are notified of their status between February 1 and March 15; transfer applicants are usually notified by May 1. In many cases, complete transcripts of course work are required before a final decision can be made. Note that these target dates apply only to those applicants who submitted their applications during the fall priority filing period (November 1-30). Those students who apply after the priority period will be notified as soon as possible after March 15.

Statement of Intention to Register

Students who are accepted for admission will receive, with their notification of admission, a Statement of Intention to Register (SIR) form. The SIR serves to notify each campus of the student's decision to accept or not accept its offer of admission. Before completing and returning the form, students who have applied to more than one campus are advised to take as much time as is appropriate in considering their responses to each campus. However, it is essential that students allow enough time to meet the deadline for returning their SIR. Once they have decided on which campus to attend, students should submit their positive SIR and nonrefundable \$100 deposit (if applicable) to the campus Admissions Office. Students should not submit a positive SIR to more than one campus. Additionally, once the positive SIR and fee have been received, the student cannot transfer to another UC campus.

Freshman students entering in the fall quarter must return their positive SIR by May 1 or by the date indicated on the SIR.

Transfer students entering in a fall quarter must return their positive SIR by June 1, or, if admitted later, by the date indicated on the SIR.

Students entering in a winter or spring quarter must return the SIR within three weeks from the date of their notification of admission.

Admission to UCI is not an assurance of receiving financial aid nor does it guarantee assignment to University housing. Separate applications are required of applicants desiring financial aid or University housing, and receipt of communications from the Financial Aid Office, the Housing Office, or any office other than the Admissions Office does not imply that eligibility for admission has been established.

Part-Time Study

UCI offers several possibilities to pursue part-time study for credit leading to an undergraduate or graduate degree. Part-time study opportunities are available in academic units in which there exists good educational reason, as determined by the academic unit, to allow part-time study. For part-time study, quarterly course enrollment is limited to 10 units or less for undergraduate students and to eight units or less for graduate students; these limits include physical education units.

The same admissions standards that apply to full-time students apply to part-time students. Under University policy, academic deans (the Dean of Graduate Studies, for graduate students) may approve Petitions for Part-Time Status for reasons of occupation, family responsibilities, or health.

In approved part-time status, one-half of the Educational Fee and one-half of the Nonresident Tuition (if applicable) are assessed. Undergraduate petitions are available from academic counselors or the Registrar's Office; graduate students may obtain further information and petitions from the Office of Research and Graduate Studies. Since there are certain restrictions on receiving undergraduate credit for part-time course work, undergraduates interested in part-time study should read, in addition to the Undergraduate Admissions section, the sections on Expenses and Fees, and Financial Aid. Graduate students should refer to the Research and Graduate Studies section.

Additional Information

Recommended Subjects

Many University programs require or recommend specific preparatory subjects to give students the needed background in their chosen fields of study. The lack of such preparation, particularly for transfer students, may delay graduation from the University. Details about these recommendations can be found in Prerequisites and Recommended Subjects, a University publication sent each year to high school and community college counselors.

Subject A and American History and Institutions

To be eligible for a bachelor's degree from UCI, students must meet a number of requirements, including those of the University of California, the Irvine campus, and the individual school and major. There are two requirements—Subject A (English Composition) and American History and Institutions—which all University of California students must satisfy in order to graduate. For specific information on these requirements and ways to satisfy them *before entrance to UCI*, refer to page 47.

College-Level Courses

The University gives unit credit to students for courses they have completed in other accredited colleges or universities. To be accepted for unit credit, the courses must be consistent with those offered by the University. All applicants with questions regarding transfer of credit should contact the Office of Admissions.

College Level Examination Program (CLEP)

The University does not grant credit for the College Level Examination Program.

Advanced Placement Examination	AP Score	Unit Credit	Credit Allowed Toward Degree (Students may be exempted from these courses and should contact an academic counselor for specific information.)
FINE ARTS			
History of Art	3, 4, or 5	8	Art History 40A-B-C. (Exempt from all 3 courses.) Satisfies Category IV of the UCI breadth requirement.
Studio Art	3, 4, or 5	8	Elective credit only.
General Portfolio		8	
Drawing		8	
		Maximum Studio Art credit 8 units	
Music	3, 4, or 5	8	Music 20 plus 4 units of elective credit.
Music Listening and Literature		8	
Music Theory		8	
		Maximum Music credit 8 units	
GOVERNMENT AND POLITICS			
American Government		4	Elective credit only.
Comparative Government		4	Elective credit only.
HUMANITIES			
English (fulfills Subject A requirement)	3 (on either exam)	8	Elective credit only.
English Language and Composition	4 or 5 (on either exam)	8	1 course toward Category IV of the UCI breadth requirement from the English 28A-B-C sequence plus 4 units of elective credit.
English Composition and Literature	4 or 5 (on both exams)	8	
		Maximum English credit 8 units	
Foreign Language (except Latin)	3 (on any foreign language exam)	8	Elective credit only.
a) French	4 or 5	8	Satisfies Category V of the UCI breadth requirement (equivalent to Language 2A-B-C series). Also satisfies the School of Humanities foreign language graduation requirement for Humanities majors (equals completion of a foreign language through the second year).
Language		8	
Literature		8	
b) German		8	
Language		8	
Literature		8	
c) Spanish		8	
Language		8	
Literature		8	
		No maximum	
Latin	3 (on one exam)	4	Elective credit only.
	3 (on both exams)	8	Elective credit only.
Virgil	4 or 5 (on one exam)	4	Latin 25.
Catullus—Horace	4 or 5 (on both exams)	8	Satisfies Category V of the UCI breadth requirement (equivalent to Latin 25, 101, 102). Also satisfies the School of Humanities foreign language requirement for Humanities majors (equals completion of a language through the second year).
History	3 (on one exam)	8	Elective credit only.
	3 (on both exams)	16	Elective credit only.

American	4 or 5	8	2 courses toward Category IV of the UCI breadth requirement from the History 29A, 29B, 29C series.
European	(on one exam)		
	4 or 5	16	Satisfies Category IV of the UCI breadth requirement.
	(on both exams)		
INFORMATION AND COMPUTER SCIENCE			
A Exam	3, 4, or 5	4	Information and Computer Science 21.
AB Exam	3 or 4	4	Information and Computer Science 21.*
	5	4	Information and Computer Science 21, 22, and 23. Satisfies Category V of the UCI breadth requirement.
MATHEMATICS AND SCIENCE			
Biology			
Non-Biological Sciences Majors	3, 4, or 5	8	Biological Sciences 1A-B-C. Satisfies Category II of the UCI breadth requirement.
Biological Science Majors	3	8	Elective credit only.
Biological Science Majors	4 or 5	8	Biological Sciences 90 plus 5 units of elective credit.
Chemistry			
	3	8	Elective credit only.*
	4 or 5	8	Chemistry 1A plus 4 units of elective credit.*
Mathematics—AB Exam			
	3	4	Elective credit only.*
	4 or 5	4	Mathematics 2A-B.
BC Exam			
	3	8	Elective credit only.*
	4 or 5	8	Mathematics 2A-B-C. Satisfies Category V of the UCI breadth requirement.
		Maximum Mathematics credit 8 units	
Physics—Exam B			
	3, 4, or 5	8	Elective credit only.
Exam C, Pt. I or II	3 or 4	4	Elective credit only.
Exam C, Pt. I (Mechanics)	5	4	Physics 3A or 5A.
Exam C, Pt. II (Electricity and Magnetism)	5	4	Physics 3B.
		Maximum Physics credit 8 units	

*Additional placement may be available following individual counseling.

Advanced Placement

The University wishes to encourage students to take demanding advanced courses in all fields. Information about honors-level courses that can be used to meet the Scholarship requirement is found on page 38. Advanced Placement courses completed during the last two years of high school qualify for honors grade points to a maximum of four units (eight semester courses).

In addition to honors grade points, the University grants eight quarter units of elective credit toward the bachelor's degree for each Advanced Placement examination passed with a score of 3, 4, or 5. (*Exceptions:* four quarter units are given for the American Government exam, for the Comparative Government exam, for the Computer Science exam, for the Mathematics AB exam, for each Latin exam, and for Physics C, Part 1, 2; eight units are given for one or both of the English, Music, Studio Art, and Physics B and C exams.) The chart shows Advanced Placement credit in satisfaction of UCI breadth and graduation requirements. Addi-

tional use of Advanced Placement credit often is made on an individual basis. For information on the UCI breadth requirement, please consult pages 53 through 55.

High School Proficiency Examination

The University of California will accept the California Certificate of Proficiency, awarded by the State Department of Education upon successful completion of the California High School Proficiency Examination, in lieu of the regular high school diploma. The University also will accept proficiency examinations from other states and the General Educational Development (GED) examination results in place of a diploma. However, all other University entrance requirements (subject pattern, grades, tests) must be met. The date of high school graduation on University records will be the date of the certificate. Entrance by standardized test scores will remain an option for the student ineligible on the basis of the high school record.

Physical Examination

All new students and those returning after an absence of two or more quarters require physical examinations and health clearances, respectively, before the first day of the quarter. See the section on Student Health.

Planning for Transfer to UCI

The University is committed to serve as fully as possible the educational needs of students who transfer from other California collegiate institutions. The principles covering transferability of unit credit and course credit are explained below and, unless otherwise indicated, are much the same whether transfer is from a two-year or a four-year institution. Information regarding eligibility for transfer may be found in the section on Admission of Transfer Students, page 39.

Unit Credit for Work Taken Elsewhere

The University of California grants unit credit for courses completed in other accredited colleges and universities when such courses are consistent with the functions of the University as set forth in the Master Plan for Higher Education in California. Equivalent advanced standing credit from institutions on the semester calendar may be determined at a ratio of one semester unit to one and one-half quarter units. (To graduate from UCI 180 quarter units, equivalent to 45 UCI quarter courses, are needed.)

California Community Colleges

Students may find it advantageous or necessary to complete the first two years of a University of California undergraduate program at one of the California Community Colleges, which are an integral part of the State's system of higher education. High school graduates who cannot be accommodated at their first University of California campus preference may choose to attend a community college and transfer to their preferred University campus at a later time. A student may earn a maximum of 105 quarter units (70 semester units) toward a University degree in a community college. No further unit credit may be transferred from a community college, although subject, major, or breadth credit for courses taken will still be granted.

Students anticipating transfer to UCI are urged to consult with their community college counselors. The community college counselor, with the aid of that college's transferable course list, can advise students about courses which will transfer to the University. Lists for each community college are updated every other year and tell which courses will transfer and for how many units. In addition to the community college counselor, staff in the Office of Admissions and Transfer Student Services Office keep current copies and can advise students about the transferability of courses.

Zero in on Transferring! Community college students who plan to transfer to UCI can have their admission guaranteed as early as one year prior to the time they enroll through a program entitled Zero in On Transferring! or "ZOT!" (nicknamed after the victory yell of UCI's mascot, the Anteater). This program assists students at selected Southern California community colleges to become eligible for admission and to complete most of the lower-division graduation requirements before they actually transfer.

To participate in "ZOT!" students must be California residents, must have completed 30 semester units of transferable course work with a minimum overall grade point average of 2.4, and must be ready to transfer to UCI within one calendar year. "ZOT!" is available to all majors except Economics, Engineering, and Information and Computer Science.

Participants receive personalized guidance in determining their admission status and in identifying specific courses to complete at their current college, along with UCI's guarantee of admission.

Additional information is available from the Transfer Student Services Office, telephone (714) 856-7821, or from the counseling office or transfer center at participating community colleges.

Four-Year Institutions

Unit credit is granted for courses consistent with the University of California's functions and which have been completed in colleges or universities accredited by the appropriate agencies. While limitations of credit may be imposed in certain subject areas, these are consonant with the curricula for all students in the University of California. No defined maximum number of units which can be earned toward the degree is set for students transferring from four-year institutions. However, see page 52 for UCI graduation requirements, including requirements for units earned in residence at this campus.

University of California Extension

Extension courses prefixed by XB, XD, XI, XR, XSB, and XSD are granted unit credit on the same basis as courses taken in residence at any accredited collegiate institution.

Students intending to transfer Extension course credit for a degree at another college or university should verify acceptance of the course with that institution. Resident students of the University of California must obtain the consent of the dean of their school or college prior to enrolling for credit in an Extension course. Extension courses are not accepted as part of the residence requirements of the University. Grades earned in University Extension are not used in calculating the University grade point average.

Decisions regarding the acceptability of extension courses taken in institutions other than the University of California rest with the Office of Admissions. Decisions regarding the applicability of such courses toward specific degrees and majors rest with the respective faculties.

Course Credit for Work Taken Elsewhere

The policies above refer only to the unit transferability of courses and are uniformly implemented on all campuses of the University. Thus, courses which are determined by the University of California to be transferable are assured only of being granted elective course credit. The application of transfer work to specific course and major requirements is determined by the student's academic dean.

The Irvine campus makes every effort to eliminate all barriers to orderly progress from California community colleges into UCI's programs. To this end, many community colleges have entered into articulation agreements with UCI so that the specific application of their courses to UCI's University, school, and departmental major requirements may be readily communicated to prospective transfer students. Students are urged to consult community college counselors or the Transfer Student Services Office for specific information on planning a program for transfer.

The University of California publication entitled *Prerequisites and Recommended Subjects* should also be consulted for planning the lower-division course of study for all programs offered on the campuses of the University of California.



American Sign Language is taught through the Disabled Student Services Office as a personal enrichment course and through the Department of Cognitive Sciences, School of Social Sciences, and the Program in Linguistics, School of Humanities, as a special topics course.

Requirements

Requirements at UCI are in four categories: those for the University of California, UCI, school, and departmental or major. Courses not specifically applicable to these are considered to be electives. See pages 52-55 for a fuller description of these requirements.

1. University of California Requirements: Subject A and American History and Institutions

Among the means of meeting the Subject A requirement is the completion of an acceptable one-quarter (four-unit) or one-semester (three-unit) transfer course in English composition with a grade of C or better.

The American History and Institutions requirement may be met by completing in high school one year of U.S. history or one semester of U.S. history and one semester of U.S. government with a grade of at least C, or upon certification by another California collegiate institution.

2. UCI Breadth Requirement

The courses and descriptions in this Catalogue may be used by prospective transfer students as a guide for selecting courses of similar content and purpose in their own institutions. However, it is strongly advised that they consult with

their counselors to verify the transferability of such courses and the applicability to UCI's breadth requirements. No student who has taken a course which is accepted for credit by the Office of Admissions and which has been mutually determined with a community college in accordance with the policies stated on page 52 as being acceptable toward completion of the UCI breadth requirement shall incur any loss of credit in satisfaction of the requirement.

Transfer students are *strongly* advised to check with the academic counselor in their perspective major, the Office of Admissions, or the Transfer Student Services Office about courses that may be used to satisfy the UCI breadth requirement. (A complete description of the breadth requirement may be found on pages 53-55.)

Transfer students transferring to UCI must satisfy the UCI breadth requirement through one of three ways: (a) completion of the current UCI breadth requirement, (b) completion of one of the options listed, or (c) completion of the UC Transfer Core Curriculum.

With the exception of students who complete the Transfer Core Curriculum, transfer students should not feel that the breadth requirement must necessarily be completed prior to matriculating to UCI. The breadth requirement, which must be completed prior to graduation, may be satisfied by college-level courses appropriate to UCI offerings and may be met *at any time* during the undergraduate years, *except* in the case of the writing requirement. Once a student matriculates to UCI, the student can take only UCI courses to satisfy the lower-division and upper-division writing requirements.

a. Completion of the UCI Breadth Requirement

Students transferring from another institution may satisfy the UCI breadth requirement (p. 53-55) by completing a year sequence (two semesters' work, minimum six semester units, or three quarters' work, minimum 12 quarter units) in *each* of the following areas:

- I. Writing
- II. Natural Sciences
- III. Social and Behavioral Sciences
- IV. Humanistic Inquiry
- V. Foreign Language, Linguistics, Logic, Mathematics, or Computer Science

Students transferring to UCI should refer to the following detailed guidelines on how to satisfy the breadth requirement in each area:

I. Writing. The lower-division writing requirement may be met by taking a year sequence in English composition. Courses used to meet the lower-division writing requirement must be completed with a minimum grade of C, or a Pass, or Credit grade equivalent to C. Transfer students may not count any course designed exclusively for the satisfaction of Subject A toward the completion of the lower-division writing requirement. Any student entering UCI with only one semester or one quarter of English composition through which the Subject A requirement is fulfilled will not have satisfied any part of the writing requirement. Once a student matriculates to UCI, the student can take only UCI courses in satisfaction of the lower-and upper-division writing requirements.

II. Natural Sciences. This requirement may be met by (a) taking a year sequence (with or without a laboratory component) in *one* of the following areas: general biology, general chemistry, basic physics; or by (b) taking two-semester or three-quarter approved courses in biological sciences or physical sciences with the exception of mathematics. These courses may or may not include a laboratory.

III. Social and Behavioral Sciences. This requirement may be met by taking a year of work in any of the following areas: anthropology, comparative culture, economics, geography, political science, psychology, sociology, or social ecology. Students on the semester system may elect to take an introductory course followed by a second course in the same area or an introductory course from each of any two areas. Students on the quarter system may elect to take an introductory course followed by two courses in one area, or an introductory course followed by a second course in the same area plus an introductory course from another area. History, for the purposes of the breadth requirement, is not considered a social or behavioral science. (See IV, Humanistic Inquiry, below.)

IV. Humanistic Inquiry. This requirement may be met by taking a year sequence in *one* of the following areas: classics, history, philosophy, humanities, English literature, comparative literature, dramatic literature, art history, history of music,

nature and theory of art. Performance courses may *not* be used in satisfaction of this requirement.

V. Foreign Language, Linguistics, Logic, Mathematics, Computer Science. This requirement may be met by taking a year sequence in *one* of the following areas: probability and statistics, calculus, logic; linguistics, computer science, or completion of the second year in a foreign language.

In satisfying the above requirements, a transfer student may count toward breadth no more than a year of work taken within the discipline of the major. For example, a student majoring in Philosophy may count no more than two semester courses or three quarter courses in philosophy toward breadth.

Note for Chemistry, Mathematics, or Physics Majors: In addition to the courses taken to fulfill the UCI breadth requirement, students majoring in Chemistry, Mathematics, or Physics are required to take one additional year sequence from one of the following breadth areas: Social and Behavioral Sciences (III), Humanistic Inquiry (IV), or the Foreign Languages or Linguistics section of Category V. For purposes of this requirement, the approved sequences are the same ones listed for the UCI breadth requirement, with the exception that a year sequence of a single foreign language at the first level is acceptable.

Note for Biological Sciences Majors: Those students majoring in Biological Sciences who have completed the School requirements and who have passed any two quarters of the writing requirement of the Humanities Core or its alternative with a grade of C or better will have satisfied the UCI breadth requirement, with two exceptions: the upper-division writing requirement and Category III, Social and Behavioral Sciences. Specifically, the Humanities Core or its alternative satisfies Category IV, Humanistic Inquiry; it also satisfies the lower-division writing requirement when two quarters of the writing component are passed with a grade of C or better. Chemistry and physics satisfy Category II, Natural Sciences. Category V, Foreign Language, Linguistics, Logic, Mathematics, and Computer Science, is satisfied by completion of the School mathematics requirement.

b. Other Options for Completing the UCI Breadth Requirement

Students who transfer from a four-year institution and who have completed the general breadth requirements of that college will be considered, upon approval of petition, to have met the total breadth requirement of UCI except for the upper-division writing requirement. All transfer students who have met the general breadth requirements of any campus of the University of California prior to transfer also will be regarded as having met the breadth requirement except for the upper-division writing requirement. Students who, upon transfer, have not completed whatever breadth requirements may have been in progress for another campus of the University of California may elect to complete at UCI either that program (plus the upper-division writing requirement) or the current UCI breadth requirement.

c. Completion of the UC Transfer Core Curriculum

Beginning with applicants to the fall quarter 1989, transfer students may fulfill the UCI breadth requirement by completing the UC Transfer Core Curriculum. The Transfer

Core Curriculum consists of a series of subject areas and types of courses which, if completed prior to transfer, will satisfy the breadth and general education requirements at any campus of the University of California. Fulfillment of the Transfer Core Curriculum does not satisfy the UCI upper-division writing requirement. It also may not necessarily satisfy UCI's school, departmental, or major requirements; this will depend upon which courses a transfer student chooses to take in meeting the Transfer Core Curriculum.

Students who do not complete the Transfer Core Curriculum prior to transferring to UCI must fulfill the UCI breadth requirement in its entirety.

Additional information is available from the Office of Admissions or the Transfer Student Services Office.

Subject Area	Terms Required	Units Required
1. Foreign Language	Proficiency	Proficiency
2. English Composition	2 semesters or 3 quarters	6 semester units
3. Mathematics/Quantitative Reasoning	1 semester or 2 quarters	3 semester units
4. Arts and Humanities	3 semesters or 4 quarters	9 semester units
5. Social and Behavioral Sciences	3 semesters or 4 quarters	9 semester units
6. Physical and/or Biological Sciences	2 semesters or 3 quarters	7 semester units
Total	11 semesters or 16 quarters	34 semester units

1. Foreign Language: This requirement may be fulfilled by completion of two years of a foreign language in high school with a grade of C or better, or equivalent proficiency demonstrated by college courses or performance tests, such as earning a minimum score of 550 on an appropriate College Board Achievement Test in a foreign language.

2. English Composition: The English Composition requirement must be fulfilled by completion of a one-year lower-division English composition sequence. Courses designed exclusively for satisfaction of remedial composition cannot be counted toward fulfillment of this requirement.

3. Mathematics/Quantitative Reasoning: One-semester or two-quarter courses in mathematics or mathematical statistics. This requirement may be fulfilled by earning a minimum score of 600 on the Mathematics section of the Scholastic Aptitude Test (SAT), or 550 on the College Board Achievement Test in Mathematics (Level I or Level II). Courses on the application of statistics to particular disciplines may not be used to fulfill this requirement.

Courses taken to fulfill the breadth/general education requirements in the subject areas that follow, Art and Humanities, Social and Behavioral Sciences, and Physical and/or Biological Sciences, should provide a broad foundation for understanding and learning to think critically, write, and speak about the biological and physical world and the most important features and accomplishments of civilization. In addition to knowledge and appreciation, courses should stress principles and concepts that unify knowledge as well as the methods of investigation that characterize specific disciplines. The following descriptions

are examples of the types of courses that could be used to meet these requirements

4. Arts and Humanities: Courses in drama, music, dance or the visual arts, history, literature, classical studies, religion, and philosophy may fulfill this requirement. At least one course must be in the arts and one in the humanities. Courses in the arts include performance or studio components; however, courses that are primarily performance or studio art courses cannot be used to satisfy this requirement.

5. Social and Behavioral Sciences: Courses in anthropology, economics, ethnic studies, political sciences, psychology, sociology, or from an interdisciplinary social science sequence.

6. Physical and/or Biological Sciences: Courses in general biology, general chemistry, basic physics, or physical sciences (with the exception of mathematics). At least one of the courses must include a laboratory.

3. School Requirements

Since school requirements occasionally cross school lines (e.g., physical science requirements for all majors in the School of Biological Sciences), courses taken to fulfill a school requirement may at the same time be applicable toward the University breadth requirement unless the school designates otherwise. Also, courses taken to fulfill a departmental major requirement may at the same time fulfill a school requirement or, within prescribed limits, the University breadth requirement.

Courses from many California community colleges have been reviewed by UCI faculty and approved as acceptable toward meeting specific lower-division requirements for breadth or the major. Although course equivalencies for the breadth requirement may be liberally interpreted for purposes of transfer, courses to be applied toward school and departmental major requirements must be more precisely equated with UCI courses in unit value and in content. By careful selection of courses, it is possible for students to satisfy some or all of the lower-division requirements of their intended program or school prior to transfer.

4. Departmental or Major Requirements

Courses to be applied toward departmental or major requirements must be more precisely equated with UCI courses in content and purpose than is the case with courses applicable to the breadth requirement (see p. 55 and departmental sections). Prospective transfer students should consult with their counselors as to the applicability of courses toward UCI requirements.

Prospective transfer students should address specific inquiries about their programs to the respective schools or departments at UCI. Community colleges wishing to clarify the status of transfer courses should consult with the Transfer Student Services Office.

Planning an Undergraduate Program

Academic Advising

At the time of admission to UCI every undergraduate student is assigned to the school or program that offers the student's selected major. Students who have not declared a major receive assistance from the General Studies Advising Program until they select an academic major.

Jurisdiction over all questions of academic regulations and academic standing rests with the dean or director of the school or program to which a student is assigned. Each academic unit provides academic advising for its students and processes requests to add or drop courses, waive or change graduation or other requirements, or change majors. Students are responsible for knowing the governing regulations of the school or program to which they are assigned.

While each academic unit is responsible for maintaining a system which provides academic advising, these systems differ from unit to unit. In some, all of the faculty serve as advisors; in others, only certain members of the faculty are designated as advisors. All advising offices include academic counselors, professionals who assist students in planning their program, selecting a major, and making progress toward a degree. Peer academic advisors (trained upper-division students) assist students in many of the same areas as academic counselors. In addition, they are able to answer questions relating to student life issues, providing a student perspective. Responsibility for informing students of the names of their advisors rests with the dean or director of the appropriate academic unit. This is done normally by letter; however, students may obtain information by telephone from the office of the appropriate dean or director (see separate listing). A student may request a change of advisor through the chief academic advisor or the dean of the unit.

New students are encouraged to plan their academic programs with an academic counselor shortly after being admitted. The optimum time to initiate contact with an academic counselor is before the student enrolls in classes. The academic counselor can help the student determine whether the classes the student wishes to take are appropriate to the student's level of preparation, whether the proposed classes fit within the student's educational goals, and whether the classes will help meet some of the requirements for graduation.

In some schools and programs, consultation between students and their faculty advisors is mandatory. Regardless of whether or not consultation between student and advisor is required, students are responsible for initiating and maintaining periodic contact with their assigned faculty advisor. An appropriate time for the initial contact is during the week prior to the beginning of the student's first classes at UCI, or earlier at the time of registration if this is possible. Thereafter, consultation between student and advisor at the time of registration for each subsequent quarter is desirable. The actual frequency of these meetings will be determined by the desires of the student, the advisor, and the unit's governing regulations.

Each quarter, new students are required to go to the appropriate academic dean's office prior to the beginning of classes for advice concerning class enrollment and to pick up their Class Verification and Identification Card. These procedures for new students and provisions for continuing students are explained in detail in the quarterly *Schedule of Classes*.

Advising Personnel

Biological Sciences		Area Code
		714
L. Dennis Smith, Dean	331 SH	856-5314
George Lauder, Associate Dean	331 SH	856-5314
Wendell M. Stanley, Jr., Associate Dean— Undergraduate Affairs and Chief Academic Advisor	BSSA	856-5318
Michael Chennault, Counselor	BSSA	856-5318
Margaret Doedens, Counselor	BSSA	856-5318
Cindy Eddleman, Counselor	BSSA	856-5318
Jessica Henderson, Counselor	BSSA	856-5318
Leticia González-MacDonald, Counselor	BSSA	856-5318
Marge Smith, Counselor	BSSA	856-5318
Marsha Polisner, Counselor	BSSA	856-5318
Carolyn C. Willmann, Counselor	BSSA	856-5318
Engineering		
William A. Sirignano, Dean	305 EGR	856-6002
Gerard C. Pardoen, Associate Dean Undergraduate Student Affairs	204 EGR	856-6737
Donald K. Edwards, Associate Dean, and Chief Graduate Academic Advisor	355C EGR	856-4841
Nancy DaSilva, Graduate Faculty Advisor for Biochemical Engineering	516B EGR	856-8288
Stephen Ritchie, Graduate Faculty Advisor for Civil Engineering	119 ICEF	856-4214
Leonard Ferrari, Graduate Faculty Advisor for Electrical Engineering	208A IERF	856-5395
Derek Dunn-Rankin, Graduate Faculty Advisor for Mechanical Engineering	744J EGR	856-8745
Robin C. Alward, Senior Academic Counselor	204 EGR	856-6749
Dee Pope, Counselor	204 EGR	856-6749
Leigh A. Richards, Counselor	204 EGR	856-6749
John D. Sommerhauser, Graduate Coordinator	355 EGR	856-6475
Fine Arts		
Robert Hickock, Dean	249 FA	856-6611
Ann Bermingham, Associate Dean	247A FA	856-6642
Cameron Harvey, Associate Dean	147B FA	856-6614
Priscilla Ortégón Pepke, Senior Academic Counselor	247 FA	856-6646
Graduate School of Management		
Dennis J. Aigner, Dean	347 GSM	856-6855
Carlton Scott, Associate Dean	324 GSM	856-6505
Carla Larsson, Senior Academic Counselor	220 GSM	856-6437
Julie Sully, Counselor	220 GSM	856-7167
Denise Zold, Counselor	220 GSM	856-4950
Humanities		
Terence D. Parsons, Dean	112 HAB	856-5131
James L. Calderwood, Associate Dean, Graduate Study	117 HAB	856-5557

Dayle Seidenspinner Núñez, Associate Dean, Undergraduate Study and Chief Academic Advisor	100 HAB	856-6453	Ramón Muñoz, Undergraduate Counselor	122 SST	856-6803
Barbara Lachance, Graduate Counselor	101 HAB	856-6720	Carol Nance, Undergraduate Counselor	122 SST	856-6803
Cathy Smith, Senior Academic Counselor	104 HAB	856-5132	Teacher Education		
Carol Thompson, Academic Counselor	106 HAB	856-5132	Director	423 SST	856-5117
Information and Computer Science			Yvonne Turner, Assistant Director for Admissions and Placement and Chief Academic Advisor	419 SST	856-7832
Leon J. Osterweil, Chair	444 CS	856-7405	Kenneth P. Bailey, Sr. Lecturer	479 SST	856-5176
Lubomir Bic, Associate Chair for Undergraduate Studies and Chief Academic Advisor	448 CS	856-5156	Ada Nix, Senior Counselor	409 SST	856-6673
Daniel Hirschberg, Associate Chair for Graduate Studies	414 CS	856-6480	Treacy Nollau, Counselor	411 SST	856-6673
Marianne Schnaubelt, Senior Academic Counselor	468 CS	856-5156	Cynthia Grzybek, Associate Counselor	415 SST	856-6673
Essie Lev, Counselor	468 CS	856-5156	Carolyn Bouldin, Teacher Intern Program	405 SST	856-5910
Mary Day, Graduate Counselor	464C CS	856-5597	Unaffiliated Students Advising		
College of Medicine			Michael Butler, Acting Dean of Undergraduate Studies	256 Admin.	856-6987
Please refer to the College of Medicine section.			Rebecca M. Schaefer, Senior Academic Counselor	256 Admin.	856-6987
Physical Sciences			Kimberly Ayala, Counselor	256 Admin.	856-6987
Harold W. Moore, Dean	220 PS	856-6506	Honors Programs		
Robert Doedens, Associate Dean and Chief Academic Advisor	230 PS	856-6507	UCI offers a variety of honors programs which provide chal- lenging opportunities for outstanding undergraduate stu- dents interested in developing their exceptional talent and ability. The honors programs offer some of the advantages usually associated with selective liberal arts colleges: rigor- ous, small, personalized classes and the intellectual exchange that creates a community of scholars. The difference, how- ever, is that UCI's programs have the support and benefit of the 21-million-volume library system of the University of California (of which UCI Library collections number some 1,300,000 volumes) and of the numerous state-of-the-art laboratories on the campus.		
Tina Arth, Academic Counselor	231 PS	856-6507	Campuswide Honors Program		
Joanne Benschop, Academic Counselor	231 PS	856-6507	The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. During the freshman and sophomore years, participants enroll in small, honors-level sections of courses and in special honors courses which satisfy the University's breadth requirements in lower- division writing, humanistic inquiry, and social and behavioral sciences. These courses are given by faculty chosen especially for their teaching ability and scholarship. During the junior and senior years, participants develop creative projects and conduct original research under the direct supervision of faculty members. In addition, they continue their intellectual exchange of ideas and experiences by participating in small, honors-level seminars. Additional information is available from the Campuswide Honors Program; telephone (714) 856-5461.		
Kathryn Harvey, Academic Counselor	231 PS	856-6507	Major-Specific Honors Programs		
Social Ecology			Honors programs for qualified junior- and senior-level stu- dents also are available to all majors in the School of Human- ities; to Economics, Political Science, and Psychology majors in the School of Social Sciences; to Information and Computer Science majors; and to Social Ecology majors. The focal point of each of these programs is the development of analytical and research skills through the pursuit of research under faculty supervision.		
Daniel Stokols, Director	202B SE	856-6094	Additional information about these honors programs is included in the School of Humanities section, the School of		
C. David Dooley, Associate Director for Undergraduate Studies and Chief Academic Advisor	212B SE	856-5293			
Karen S. Rook, Associate Director for Graduate Studies	232E SE	856-7069			
Kay Helwig, Graduate Counselor	270 SE	856-5917			
Jill Vidas, Assistant Graduate Counselor	270 SE	856-5918			
Carol Stanley, Senior Academic Counselor	163 SE	856-6861			
Jean Martinez, Counselor	163 SE	856-6861			
Ana Pereira, Associate Academic Counselor	163 SE	856-6861			
Janet Stevens, Field Study Coordinator	163 SE	856-6861			
Social Sciences					
William R. Schonfeld, Dean	607 SST	856-6801			
Kenneth A. Small, Associate Dean for Graduate Studies	637 SST	856-7274			
Robert Newcomb, Acting Associate Dean for Undergraduate Studies and Chief Academic Advisor	639 SST	856-7027			
Ivonne Maldonado, Graduate Counselor	638 SST	856-7352			
Viviane Wayne, Graduate Counselor	637 SST	856-5924			
Jane Elliott, Undergraduate Counselor	122 SST	856-6803			
Richlyn Evins, Undergraduate Counselor	122 SST	856-6803			

Social Sciences section, the Department of Information and Computer Sciences section, and the Program in Social Ecology section.

Preparation for Graduate or Professional Study

Undergraduate students ought to keep the possibility of future graduate or professional study in mind as they plan their academic programs, and they should discuss their career goals with their advisors. Students who have an idea of the direction in which they would like to go should familiarize themselves with the basic requirements for postbaccalaureate study and keep those requirements in mind when selecting courses. Furthermore, students should supplement their undergraduate programs by anticipating foreign language requirements at major graduate schools and by intensive work in areas outside their major that are of special relevance to their intended graduate work.

For information about graduate or professional study in a given field, students may consult the graduate advisor or an academic counselor in the academic unit corresponding to the area of interest. Also, the Career Planning and Placement Center frequently sponsors seminars on specific career areas and offers a number of services useful to those considering graduate or professional study.

Supplementary Educational Programs

There are several supplementary educational opportunities available to students at UCI: University Extension, Summer Sessions, the Air Force Reserve Officer Training Corps (ROTC) program, the Army ROTC program, the Naval ROTC program, two Universitywide activities, the Education Abroad Program and the Education at Home Program, and one campuswide program, The International Opportunities Program. The Education Abroad Program offers students the opportunity to experience a different culture while making progress toward degree requirements. The Education at Home Program enables participants interested in early American history and culture to spend a quarter in Williamsburg, Virginia; Philadelphia; and Washington, D.C. The International Opportunities Program helps students explore the wide range of opportunities available for going abroad. For further information on each of these programs, please see pages 60-62.

Requirements for a Bachelor's Degree

There are four requirements that must be met to obtain a baccalaureate degree from UCI: University, UCI, School, and departmental. Each is described below.

University Requirements

1. **English ("Subject A").** Every undergraduate must demonstrate upon entrance to the University an acceptable level of ability in English composition.

This requirement may be met *before* entrance by:

- a. Achieving a grade 5, 4, or 3 in either of the two College Board Advanced Placement Examinations in English; *or*
- b. Achieving a score of 600 or better in the College Board English Composition Achievement Test; *or*
- c. Completing the California State University English Equivalency Test with "Pass for Credit"; *or*
- d. Entering the University with credentials from another college which show the completion of an acceptable one-quarter (four units) or one-semester (three units) course in English composition with a grade of C or better. NOTE: High school English courses will not satisfy this option.

Those students who have not met the Subject A requirement before entrance must satisfy the requirement before the beginning of their fourth quarter at UCI. Students who have not satisfied the requirement by that time will be ineligible to enroll for a fourth quarter.

Students enrolled in Humanities 20A-B-C-D (Writing for Students for Whom English is a Second Language) must enroll in a Subject A course (English and Comparative Literature WR39A or Humanities 1A/SA) immediately after they are authorized to do so.

This requirement may be met *after* admission by one of the following three options:

- a. Passing the Universitywide Subject A Examination given on May 13 (and on subsequent dates) to all entering freshmen admitted for fall quarter, 1989 (see p. 25). Transfer students who have not satisfied the Subject A requirement should contact the UCI Composition Program Office (220 Humanities Office Building) for evaluation; telephone (714) 856-6717.
- b. Enrolling in sections of the Humanities Core Course designated "S/A." (NOTE: Students held for Subject A and enrolled in the Humanities Core must enroll in a S/A section of the Core Course during their first quarter. Successful completion of the writing component of these sections of this course with a grade of C or better will satisfy the Subject A requirement. Students who do not receive a C or better will in Humanities 1A S/A in fall quarter and continue to be held for Subject A must enroll in Humanities 1B S/A during the winter quarter and satisfy the requirement by earning a C or better. Like all courses used to satisfy the Subject A requirement, S/A sections of the Humanities Core Course must be elected for a letter grade.)
- c. Taking English and Comparative Literature WR39A and receiving a letter grade of at least a C in that course (the Pass/Not Pass option may not be used to satisfy the Subject A requirement). This option is available only to those students who score below 600 on the College Board English Composition Achievement Test and who have followed neither option (a) or (b) above.

Once a student matriculates at UCI, the student may not offer a transfer course from another institution to satisfy the Subject A requirement.

2. **American History and Institutions.** This requirement may be met by one of the following:

- a. Completion in high school of one year of United States history with grades of C or better, *or* one semester of United States history and one semester of United States government with grades of C or better.
- b. Receiving a score of 5, 4, or 3 in the Advanced Placement Examination in United States History.
- c. Receiving a score of 500 or higher in the College Board Achievement Test in American History and Social Studies.
- d. Presentation of a certificate of completion of the requirement at another California institution.
- e. Completion at another institution of one year of college-level United States history with grades of C or

better, or one course in United States history and one in United States government with grades of C or better.

f. Completion at UCI, with a grade of C or better, of History 10 and either Social Sciences 23D or 25C.

g. Passing an examination in these subjects. (Students should contact the Office of the Dean of Undergraduate Studies, 256 Administration, for further information about the examination.)

UCI Requirements

3. Credit for 180 quarter units, earned by examination, by other evaluation, or course work. A course normally offers four quarter units of credit.
4. A grade average of at least C (2.0).
5. Candidates for the baccalaureate must attain at least a C (2.0) average in all of the courses required in the major program and at least a C (2.0) average in the upper-division courses required in the major program. Higher averages than this may be required only in honors programs. Students who fail to attain a C (2.0) average in courses required in the major program may, at the option of the major unit, be denied the privilege of pursuing a major program in that unit. (In this context, "the courses required in the major program" are defined as the courses required for the major and offered by the program of the student's major.)
6. Credit for the last 36 units of work immediately preceding graduation must be earned in residence at the UCI campus. Exceptions to this rule may be allowed, with prior departmental approval, to students enrolled in the Education Abroad Program.
7. Students enrolled at UCI from their freshman year may elect to meet as graduation requirements (UC, UCI, school, and major requirements) those in effect at the time of entrance or those subsequently passed after entrance. Students transferring from other collegiate institutions may elect to meet as graduation requirements those in effect at the time of transfer to UCI, those subsequently passed, or those in effect at the time of entering their other collegiate institution, provided that the date of entrance at the previous institution is not more than four years prior to the time of transfer to UCI. Students who transfer from a four-year institution and who have completed the general breadth requirements of that college, upon approval of petition, will be considered to have met the total breadth requirement of UCI except for the upper-division writing requirement. Students who have completed the Transfer Core Curriculum will be considered to have met the UCI breadth requirement. Students who transfer from a community college and who have met the general breadth requirement of any UC campus prior to transfer also will be regarded as having met the breadth requirement except for the upper-division writing requirement. A student who seeks readmission to UCI more than three consecutive quarters after withdrawing from student status must adhere to the graduation requirements in effect at the time of readmission or those subsequently passed.
8. **Breadth Requirement.** Candidates for the bachelor's degree must satisfy the UCI breadth requirement. The requirement is designed to ensure that UCI graduates will have been exposed to a broad spectrum of fundamental areas of intellectual experience. It is a **graduation** requirement and therefore need *not* be satisfied during only the lower-division years. To satisfy the breadth requirement,



UCI's breadth requirement exposes students to a broad spectrum of fundamental areas of intellectual experience.

three courses, normally four units each, are required in each of the following areas:

- I. Writing
- II. Natural Sciences
- III. Social and Behavioral Sciences
- IV. Humanistic Inquiry
- V. Foreign Language, Linguistics, Logic, Mathematics, or Computer Science

The specific course combinations and sequences in each area which may be used by students to satisfy the requirement are listed below. A number of the courses listed are available in more than one academic unit. Students should refer to the actual descriptions of the courses to determine which are cross-listed.

These course combinations were selected to ensure the following:

- (1) that students, in meeting the requirement, be exposed to subject matter, problems, and techniques which would serve as a first introduction to an academic area and
- (2) that in meeting the requirement students be exposed to a connected set of courses which provide a coherent experience in that academic area.

NOTE: In satisfying the breadth requirement, a student may count toward breadth no more than three courses taken within the discipline of the major. For example, a student majoring in Philosophy may count no more than three Philosophy courses toward breadth.

Students fulfill the UCI breadth requirement by completing courses from the list which follows. The courses in the list are grouped according to which aspect of the breadth requirement they cover. Students can select from among a variety of courses, depending upon their area of interest. Some of the course combinations available consist of multiple-quarter courses (such as Chemistry 1-A-B-C under the Chemistry subsection of "II. Natural Sciences"). Multiple-quarter courses are referred to as being "sequential," meaning that the course work in the earlier courses is prerequisite to the later course work. Students must take each part of a sequential course in alphabetical order (e.g., students must take Chemistry 1A before either 1B or

1C). Sequential courses are separated by hyphens. Other course combinations consist of single-quarter courses (e.g., Social Sciences 2A, 2B, 2C under the Anthropology subsection of "III. Social and Behavioral Sciences") which are related to one another but for which no course in the combination is preparatory to any other course in the combination. Single-quarter course combinations may be taken in any order. Single-quarter courses are separated by commas. Semicolons separate complete course combinations.

I. Writing Requirement. Because of the importance of writing in every academic discipline, the University is committed to developing the verbal skills of its students at all levels and in all areas. The Writing Requirement expresses this commitment, but the concern for and attention to clear, accurate writing is expected of faculty and students in all courses.

The Writing Requirement consists of three courses beyond the Subject A Requirement. Except where otherwise noted below, students must satisfy the Subject A Requirement *prior to* fulfilling the Writing Requirement.

Two of the three courses required must be lower-division courses and normally must be completed prior to the junior year (or in the case of transfer students within the first year of residency). The third course must be an upper-division course, and it must be taken only after the successful completion of 84 quarter units (achievement of junior status) and completion of the lower-division requirement.

Once a student matriculates to UCI, the student can take only UCI courses in satisfaction of the lower-division and upper-division writing requirements.

Lower-Division Requirement: The two courses taken to fulfill the lower-division requirement must be completed with a grade of C or better. Students may select from the courses specified below:

1. English and Comparative Literature WR39B (Expository Writing) and English and Comparative Literature WR39C (Argument and Research).
2. Humanities 15-16 (Humanities Writing Sequence) taken in conjunction with associated courses. For 1989-90 the associated courses are History 29A, 29B, 29C, and History 50A, 50B, 50C.
3. Two quarters of the writing component of the Humanities Core Course (Humanities 1A-B-C) beyond satisfaction of the Subject A requirement. (NOTE: Students held for Subject A and enrolled in the Humanities Core must enroll in a section of the Core Course designated S/A during their first quarter. Successful completion of the writing component of these sections of this course with a grade of C or better will satisfy the Subject A requirement. For these students, the lower-division writing requirement may be satisfied only in the second and third quarters of the Humanities Core Course. Students who do not receive a C or better in Humanities 1A S/A in fall quarter and continue to be held for Subject A must enroll in Humanities 1B S/A during the winter quarter and satisfy the requirement by earning a C or better. The lower-division writing requirement will be satisfied in the second and third quarters of the Humanities Core Course for these students.)
4. Students who complete English and Comparative Literature WR39B or Humanities 15 with a grade of B (3.0) or better may substitute as the second course of the lower-division Writing Requirement one of the following courses in creative writing or nonfiction and journalism: English

and Comparative Literature WR30, WR31, WR32, or WR38.

Upper-Division Requirement: The course taken to fulfill the upper-division requirement must be completed with a grade of C (2.0) or better. The requirement may be satisfied by completing any one of the following:

1. English and Comparative Literature WR139W.
2. An upper-division course in nonfiction and journalism or creative writing. Such courses frequently have special prerequisites. Students may not use such a course to satisfy the requirement unless they have attained a B or better in both courses taken to satisfy the lower-division Writing Requirement.
3. An upper-division course designated on a list of approved courses in the quarterly *Schedule of Classes* as approved for satisfaction of the requirement. Note: All courses approved to fulfill the upper-division writing requirement should have a "W" suffix. Students are encouraged to consult the *Schedule of Classes* or their advisor to determine the current upper-division writing requirement course offerings. If a course on the approved list is offered without the "W" suffix, it does not satisfy the upper-division writing requirement.
4. By examination (refer to the quarterly *Schedule of Classes*).
Students who fail to attain the required grades in the courses taken in fulfillment of the Writing Requirement should refer to page 65 for further information.

II. Natural Sciences. Students must select a three-course combination from one of the following areas:

Biological Sciences: Students may select any three courses from Biological Sciences 1A, 1B, 1C, 1D, 1E, 1F, 1G, 79, 80, 81.

Chemistry: Chemistry 1A-B-C and 1LB-LC or 1LAE-LBE.

Physics: Physics 3A-B-C and 3LA-LB; 5A-B-C and 5LB-LC; three courses from 20A, 20B, 20C, 20D; 17A-B *plus* one course from Physics 16, or 20A, 20B, 20C, 20D.

Social Ecology: Social Ecology E3, E4, E5.

III. Social and Behavioral Sciences. Students must select three courses from one of the following areas, *or* two courses from one area plus a third from another area. The first course taken in any area *must* be an introductory course numbered 1-12, or, in the case of Comparative Culture, 70A, 70B, and 70C.

Anthropology: Social Sciences 2A, 2B, 2C.

Comparative Culture: Social Sciences 70A, 70B, 70C.

Economics: Social Sciences 1A, 4, 12A-B-C.

Geography: Social Sciences 5A, 5B, 5C; 18A, 18D.

Political Science: Social Ecology J80, Social Sciences 6A, 6B, 6C, 23A, 23B, 23C, 23D, 24A, 24B, 26B, either 61F or 61P (if 26B has not been taken).

Psychology: Social Ecology S9, S11, S86; Social Sciences 7, 50T, 51A, 55C, 61A.

Sociology and Social Ecology: Social Ecology 1, 10, E8, J4, J40, S86; Social Sciences 1A, 8A, 8B, 8C, 13A, 61A, 61B, 61C, 61D, either 61F or 61P.

Interdisciplinary: Social Ecology H20A-B-C or Social Sciences H1E-F-G.

IV. Humanistic Inquiry. Students must select a three-course combination from one of the following areas:

Arts: Art History 20A, 20B, 20C, 20D, 20E, 20F; Art History 35A-B-C; Art History 40A-B-C; Art History 42A-B-C; Studio Art 30A-B-C; Studio Art 35A-B-C; Dance 90A, 90B, 90C; Dance 91A-B-C; Drama 40A-B-C; Music 4A-B-C; Music 40A-B-C.

Humanities: Classics 35A-B-C; History 29A, 29B, 29C; History 42A-B-C; History 43A, 43B, 43C; History 50A-B-C; Humanities 1A-B-C; Humanities 55A, 55B, 55C; Philosophy 1, 4, 5; Philosophy 10, 12, and either 11 or 13; History 60, Philosophy 60, and either History 186 or Philosophy 160.

Literature: Classics 50A-B-C; English and Comparative Literature CL 50A-B-C; English and Comparative Literature E6, E7, E8; English and Comparative Literature E 28A-B-C; French 50A-B-C; Humanities 30A-B-C; Russian 20, 30, 40; Spanish 50A-B-C.

V. Foreign Language, Linguistics, Logic, Mathematics, Computer Science. Students must select a three-course combination from one of the following areas:

Computer Science: ICS 21, 22, 23.

Foreign Languages: Classics 2A-B-C; French 2A-B-C; German 2A-B-C; Greek 25, 101, 102; Italian 2A-B-C; Latin 25, 101, 102; Linguistics C2A-B-C; Linguistics J2A-B-C; Portuguese 1A-B-C plus three upper-division Portuguese courses chosen from among 140A-B through 145; Russian 2A-B-C; Spanish 2A-B-C.

Linguistics: Linguistics 50 and two courses from Linguistics 110, 120, or Social Sciences 50A.

Logic and Mathematics: Mathematics 2A-B and either 2C, 7, or 13; Mathematics 6A-B-C; Philosophy 30, 130A-B; Social Sciences 11A-B-C; Social Sciences 100A-B-C.

Many of the above courses are cross-listed with courses in other units. When a breadth requirement course is cross-listed with another course, that course also is available for fulfillment of the breadth requirement.

All students planning to transfer to UCI should see page 48 for details on fulfilling the UCI breadth requirement.

School and Departmental Requirements

In addition to the University requirements listed above, each undergraduate student must satisfy the degree requirements for the major and, if applicable, the minor or concentration selected. UCI, school, and departmental or major and minor requirements may overlap; courses taken to fulfill a school or departmental requirement (e.g., the physics course requirement in the School of Biological Sciences) may also help fulfill the UCI breadth requirement. Some restrictions exist. Students are urged to make sure that they understand how many courses are permitted to satisfy more than one requirement. Information on specific degree requirements, as well as courses offered, can be found elsewhere in this Catalogue.

Students should have declared a major no later than the beginning of their junior year, having made certain that the background and the preparation prerequisite to junior and senior work in the major have been accomplished. New and continuing undergraduate students should read the section on Academic Advising for Planning an Undergraduate Program; transfer students should also read the section on Planning for Transfer to UCI.

Application for Graduation

In order to receive a degree, an undergraduate student should file an Application for Graduation at the appropriate dean's office, preferably during the first quarter of the senior year, but no less than six months before the expected day of graduation. Specific deadline dates for filing an Application for Graduation are established quarterly by each academic unit so that candidates' academic records can be reviewed to verify that all graduation requirements have been met. These dates vary among academic units.

Enrollment and Other Procedures

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning enrollment and academic policies applying only to graduate students is given in the Graduate Studies and Research section.

Enrollment and Payment of Fees

To receive academic credit for regular courses and other supervised instruction or research, a student must be officially enrolled prior to undertaking such activities. **Enrollment does not become official until all required fees have been paid, and the student's Enrollment in Classes Petition has been completed correctly, signed where necessary, and received by the Registrar. Students are responsible for ensuring that their course enrollments as indicated on the Class Verification and Identification Card are correct.**

Registration materials are available from the Registrar's Office approximately six weeks before the beginning of each quarter. The most important form in the registration materials is the Enrollment in Classes Petition. It should be filled out carefully, according to the instructions in the *Schedule of Classes*. A quarterly calendar of dates for submission of enrollment materials and payment of fees is included in each quarterly *Schedule of Classes*. The *Schedule of Classes* booklet may be purchased at the University Bookstore approximately six weeks prior to the beginning of each quarter.

The general procedures for enrollment are:

1. Consult the appropriate academic advisor to develop an approved program of study. Secure necessary signatures on the Enrollment in Classes Petition for courses that require special approval.

New undergraduate students entering in the fall should seriously consider attending one of the Student-Parent Orientation Program (SPOP) sessions during the summer for academic advising and enrollment assistance.

2. Pay careful attention to deadlines and submit the completed class enrollment and updated student information forms to the Registrar.
3. Pay required fees to the Cashier. Any other outstanding obligations must be satisfied at this time also.

NOTE: If either fees or the Enrollment in Classes Petition are not submitted by the deadline, students are required to enroll in classes using the Add-card procedure.

Class Verification and Identification Card

After payment of fees and submission of enrollment materials, a Class Verification and Identification (CV & ID) card is available for each student. The card lists the courses in which a student is enrolled. If any courses requested could not be

scheduled, they are listed also, with the reason why the student is not enrolled in the course. Changes to course enrollments after receipt of the CV & ID card are handled through Add, Drop, or Change of Grading Option cards, available from the student's academic counseling office or the Registrar.

New undergraduate students obtain their CV & ID card in their academic counseling offices, where they may also obtain advice concerning their academic programs.

Continuing undergraduate students and graduate students should consult the quarterly *Schedule of Classes* for instructions on where to secure their cards.

The CV & ID card is certification of the student's class enrollment and is evidence that the student is registered at UCI and is entitled to Library privileges. In addition, the card provides identification for Associated Students functions. If the card is lost, there is a \$3 replacement charge. Inquiries regarding the replacement of lost cards should be directed to the Registrar's Office.

Late Enrollment and Payment of Fees

Students who do not submit an Enrollment in Classes Petition to the Registrar's Office during the published period are subject to a late service fee. The late service fee is graduated. Between the deadline and the end of the second week of classes, the late service fee is \$25. Thereafter it increases to \$50. A signature of the student's dean is required for late enrollment.

Students who do not pay all required fees to the Cashier's Office during the published period for fee payment are subject to a late service fee. This fee is also graduated: \$25 through the end of the second week of classes; \$50 thereafter.

The student is subject to *both* late service fees (either \$50 or \$100) if fees are not paid to the Cashier's Office and the Enrollment in Classes Petition is not returned to the Registrar's Office by the deadlines, which are published quarterly in the *Schedule of Classes*.

To avoid the expense and inconvenience of late enrollment, students are urged to enroll and pay fees well before the published deadlines. Students with financial need should make advance arrangements with the Financial Aid Office, or another source, to have funds available when fees are due. The Registrar does not have authority to allow a student to pay fees after the deadline date or to waive the late fees, except in unusual cases where the University is responsible for the late transaction. A student who is allowed to apply late and, as a result, must pay fees and enroll late, is required to pay late service fees.

Change of Class Enrollment

After official enrollment materials have been filed with the Registrar, a student may add or drop courses, change sections of a course, or change the grading option by completing an Add, Drop, or Change of Grading Option Card, available from the student's academic counseling office or the Registrar's Office. There is a \$3 service charge for all add, drop, or change transactions *received* in the Registrar's Office after the second week of classes.

An undergraduate student may not enroll in more than 20 units (excluding Physical Education) nor fewer than 12 units of course work during a given quarter without the permission of the student's academic dean. Changes to Pass/Not Pass grading must not cause the student to exceed the limitations to Pass/Not Pass enrollment.

Graduate students may not enroll in more than 16 or fewer than eight units of graduate or upper-division credit without prior approval of the departmental Graduate Advisor and the Dean of Graduate Studies.

During the first six weeks of each quarter, a student may add classes provided approval to add each class is granted by the instructor in charge. To add a class, a student must obtain the instructor's signature of approval on an Add card, pay the service charge (if applicable), carefully complete the Add card, and submit the card to the Registrar's Office no later than the end of the sixth week of instruction.

The dated signature of the instructor is always required and is valid for 10 working days.

To drop a class or change the grading option during the first two weeks of the quarter, a student must obtain the signature of the instructor in charge as evidence of notification on a Drop or Change of Grading Option Card and submit the card to the Registrar's Office no later than the end of the second week of instruction.

Students may drop classes from the third through the sixth week of a quarter, inclusive, only with the permission of the instructor in charge. A student wishing to drop a class during this period must obtain the signature of approval from the instructor in charge on a Drop card, pay \$3 at the Cashier's Office, and submit the card to the Registrar's Office.

After the sixth week of a quarter, students may drop a course only with the permission of the instructor and the student's academic dean. Permission to drop after the sixth week can be granted only if the student is not failing the course and not subject to disqualification, and only if dropping the course would be to the educational benefit of the student, of the class as a whole, or both. To drop a class after the sixth week, a student must complete a Drop card, obtain the instructor's and the dean's signatures of approval, pay \$3 at the Cashier's Office, and submit the card to the Registrar's Office. Graduate students must have the approval of the Dean of Graduate Studies to drop a course after the sixth week.

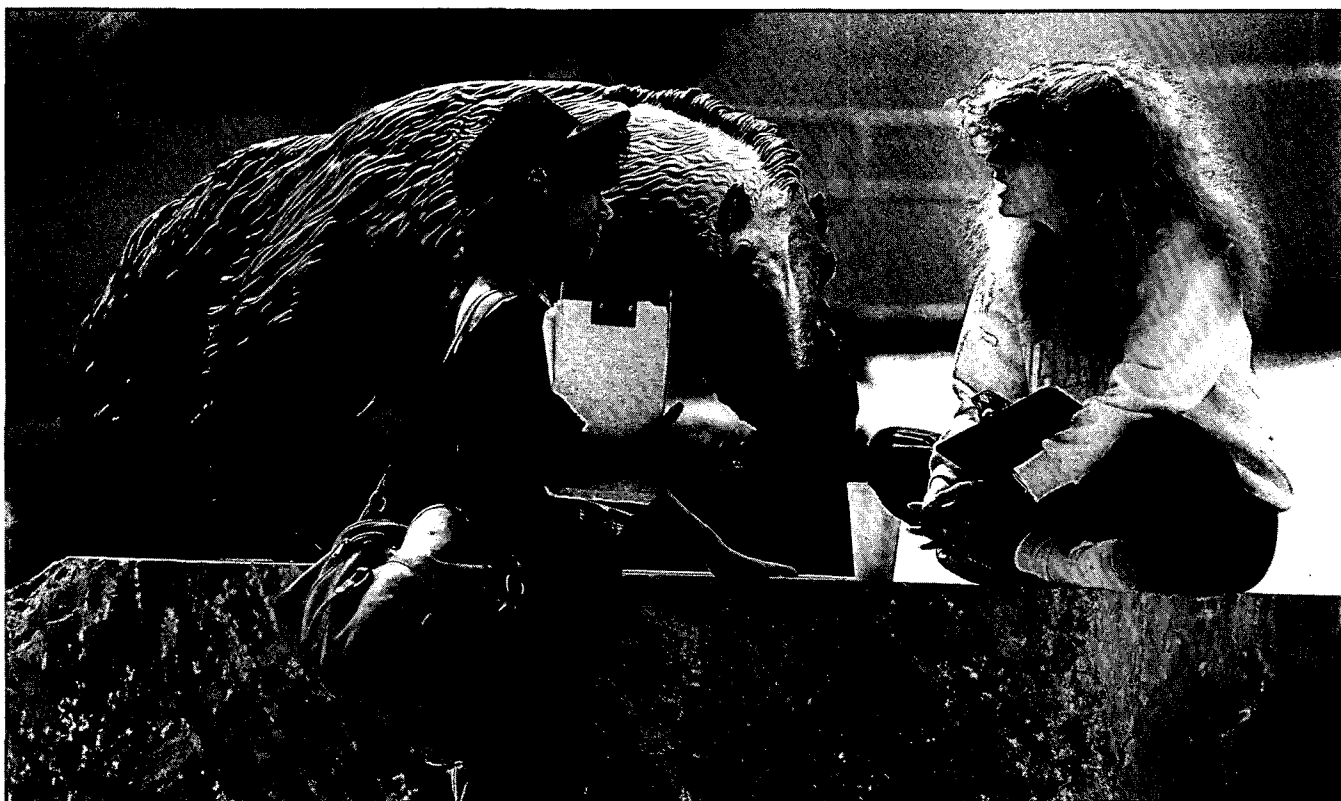
A W notation will be recorded for each course dropped after the end of the sixth week of classes. The effective date of a "drop" is the date the approved Drop card is received in the Registrar's Office.

Every student enrolled in a laboratory course in which equipment is issued is responsible for the equipment when dropping a course and will not be permitted to drop until the equipment is accounted for.

Students are responsible for their official enrollment and must be officially enrolled in each class they attend. They must officially drop classes they have ceased attending. The student cannot simply discontinue attendance in a class; a Drop card must be filed before the last day of instruction for the quarter. Students are urged to verify their official enrollment early in the quarter. Students enrolling for the next quarter will find this information included with enrollment materials for the next quarter. Those students not enrolling for the next quarter can verify their official enrollment by inquiring at the Registrar's Office.

The Registrar's Office cannot accept Add, Drop, or Change cards after the last day of instruction of a particular quarter.

NOTE: Instructors and deans may have earlier deadlines than those mentioned above.



UCI's mascot Peter the Anteater stands guard in front of the Bren Events Center. The 430-pound bronze statue, created by New Mexico artist Billy Fitzgerald, was a gift from the class of 1987.

Lapse of Status

A student's status may lapse for the following reasons:

Failure to pay required student fees by the prescribed deadline; failure to respond to official notices; failure to settle financial obligations when due or to make satisfactory arrangements with the Cashier's Office; failure to complete the physical examination; or failure to comply with admission conditions.

Each student who becomes subject to lapse of status action is given advance notice and ample time to deal with the situation. However, if the student fails to respond, action will be taken without further notice. A "hold" will be placed on all of the student's records and the student will be entitled to no further services of the University except assistance toward clearing the hold. A student must satisfy the conditions which caused the lapse of status before the hold can be cleared.

Retention of Student Records

The Registrar's Office maintains a permanent record of academic work completed by each student. Support documents for the academic record are kept for one year.

Students are strongly advised to carefully check their academic record quarterly. (Student grade reports are available at the Registrar's Office shortly after the close of each quarter.) Discrepancies in the academic record should be reported to the Registrar immediately. After one year, it is assumed that the student accepts the accuracy of their academic record, and supporting source documents are destroyed. When the degree has been certified by the student's dean, a student's academic record may not be altered except in those cases where a procedural or clerical error on the part of the instructor has occurred.

Transcript of Records

The transcript of a student's academic records will be released only upon receipt of a signed request of the student authorizing the release. Application may be made in person or by mail; telephoned requests cannot be honored because payment is due in advance. Application for a transcript should be submitted to the Cashier's Office with a check or money order payable to Regents-UC for the exact amount due. The fee for transcripts is \$3 per copy. All outstanding debts to the University (with the exception of long-term financial aid loans not yet due and payable) must be paid in full before a transcript will be released.

Requests for transcripts by other than the student whose transcript is being sought can be honored only (1) if the request is accompanied by a written authorization signed by the student whose transcript is sought, and (2) upon approval of the Registrar. Such transcripts can be released by the Registrar *only* to another college, university, or educationally related agencies such as the Law School Data Admissions Service (LSDAS) or the American Medical College Application Service (AMCAS). Such transcripts cannot be released to the person making the request in the student's stead.

When a student orders a transcript to be sent to another college, university, or agency, it is extremely important for the student to provide a complete, accurate mailing address to ensure delivery to the correct office. At least two weeks should be allowed for a transcript to be received by another institution or agency.

Verification of Student Status

There is a \$3 fee for each verification of student status performed by the Registrar's Office either at the window or by mail. Needs for which such verifications are performed include reference checks, bank loans, applications for good-student-driver insurance rates, and Social Security payments. For verification purposes, enrollment in 12 units or more in regular sessions is considered to be full-time status; enrollment in eight units is considered to be half-time status. Summer session enrollment in eight units is considered to be full-time status.

Diplomas

Students are advised by mail when their diplomas are available, which is about four months after the quarter in which the degrees are awarded. Students may then pick up their diplomas at the Registrar's Office or authorize the Registrar to send their diplomas by certified mail, or registered air mail to locations outside the United States. There is a service charge of \$5 for certified mail, \$6 for registered air mail, payable to Regents-UC. All outstanding debts due to the University, with the exception of long-term financial aid loans, must be paid in full before a student's diploma will be released. See Commencement, pages 59 and 72.

Cancellation/Withdrawal

Students who pay fees for a regular academic quarter and then decide to withdraw from the University must submit a Cancellation/Withdrawal form, together with their identification card for the current quarter, to the Registrar's Office after obtaining the signatures of their academic dean and the University Ombudsman. Medical students must submit the form to the Curricular Affairs Office in the College of Medicine. This form serves two purposes: 1) a refund of fees, if applicable (see Fee Refund section); and 2) automatic withdrawal from classes.

The effective date of withdrawal used in determining the percentage of fees to be refunded is the date on which the student submits the withdrawal form to the Registrar's Office or to the Curricular Affairs Office.

A W notation will be recorded for each course in which enrollment is withdrawn if the student's effective date of withdrawal is after the end of the sixth week of classes. (See W notation under Grading System section.)

A graduate student in good academic standing who wishes to withdraw and intends to return within one year may submit both the Cancellation/Withdrawal form and an application for a Leave of Absence. Further information about leaves of absence and cancellation/withdrawals appears in the Research and Graduate Studies section.

If an undergraduate student plans to leave the University after completing all academic work for the latest quarter of enrollment and has not paid fees for the next quarter, a formal notice of withdrawal is not necessary.

See page 30 for information on fee refunds.

Readmission: Undergraduate Students

Students are strongly urged to consider the policy below in formulating plans for leaving or returning to UCI. Every effort will be made to readmit UCI students who were in good academic standing at the time they ceased attending and who have filed readmission applications.

Readmission is not automatic. To apply for readmission, a student must first pay a nonrefundable \$35 Application Fee at the Cashier's Office, and then file an Application for Readmission with the Registrar's Office at least *eight weeks*

prior to the quarter in which readmission is desired. Readmission is subject to dean's approval and campus deadlines (August 1 for fall quarter, November 1 for winter quarter, and February 1 for spring quarter).

If a student has been academically disqualified from the University or has left the University while on probation or subject to disqualification, the student must apply for readmission in the manner prescribed above. The application, however, will be forwarded to the dean of the school which the student hopes to enter. If the dean decides that the student is serious about academic life, and/or that the student has displayed capability at another academic institution, the student will most likely be allowed readmission to the University.

Transcripts for work taken at other institutions must be submitted as part of the application. A nonrefundable fee of \$35 is charged for each Application for Readmission. Remittance by bank draft or money order payable to Regents-UC must be attached to the application.

Readmission: Graduate Students

A graduate student who withdraws and has not been granted a leave of absence approved by the Dean of Graduate Studies can resume graduate study only if readmitted. The Application for Readmission must be submitted by the published deadline for graduate admission applications. Please refer to the statement on readmission which appears in the Research and Graduate Studies section.

Intercampus Transfer: Undergraduates Only

An undergraduate student in good standing at UCI may apply for transfer to another campus of the University of California. To do so, the student should obtain an Undergraduate Application packet from the UCI Undergraduate Admissions Office or the Registrar's Office and file the application by the deadline prescribed for the quarter in which the student wishes to transfer. (This application is the same as that used by new applicants to the University of California; it is important to indicate on the application where requested that the student's current enrollment is a UC campus.) The filing periods for the Undergraduate Application are: winter quarter—July 1-31; spring quarter—October 1-31; fall quarter—November 1-30. (The University's campus at Berkeley is on the semester system and has filing periods as follows: spring semester—July 1-31; fall semester—November 1-30.) After these dates, applications are accepted only until quotas are filled. A student may apply to as many other University of California campuses as desired in any given quarter. Payment of a nonrefundable fee is required for all intercampus transfer requests filed. The fee is based on the number of campuses to which the student applies.

Intercampus Visitor: Undergraduates Only

A currently registered UCI undergraduate student in good standing may apply for intercampus visitor status at another campus of the University for one quarter. Forms and instructions are available at the Registrar's Office.

California Residence

All inquiries with regard to the requirements for the establishment of California residence (including exceptions pertaining to minors, aliens, and dependents of military personnel stationed in California) should be directed to the Residence Deputy, Registrar's Office, 215 Administration Building, University of California, Irvine; Irvine, California 92717, (714) 856-6129 or the Office of the Legal Analyst—Residence Matters, 590 University Hall, University of California, Berkeley, California 94720, (415) 642-2822. Please refer to the Fees

section for information on the Nonresident Tuition Fee and California residence.

Commencement

Students who graduate any quarter of the academic year may participate in the year-end graduation ceremony. Commencement protocol information is mailed to all prospective graduates in late spring and also is available in the office of each academic counselor. See Diplomas, page 58.

Application for Graduation

In order to receive a degree, an undergraduate student should file an Application for Graduation at the appropriate counseling office, preferably during the first quarter of the senior year, but no less than six months before the expected day of graduation. Specific deadline dates for filing an Application for Graduation are established quarterly by each academic unit so that candidates' academic records can be reviewed to verify that all graduation requirements have been met. These dates vary among academic units.

Orientation, Major Campus Publications, and Supplementary Educational Programs

Orientation

Orientation programs include Academic Advising and Orientation Week, held in the fall; the Student-Parent Orientation Program (SPOP), a 36-hour live-in experience on campus for new students and their parents; and Uni-Prep, a five-day, intensive program in September to help new students develop increased social and intellectual skills. All of these programs are sponsored by the Student Support Services Office, located in 201 and 209 Administration Building, (714) 856-7759.

Academic Advising and Orientation Week, commonly known as "O-Week," offers academic and social activities for new and returning students and is scheduled the week prior to the beginning of fall quarter classes. Students who enroll later in the academic year (winter or spring quarter) participate in an abbreviated orientation prior to the beginning of the appropriate quarter.

Student-Parent Orientation Programs (SPOP) are held on three different weekends during the summer. SPOP is designed to help new students with their registration materials and offers informative sessions on academic programs, extracurricular activities, housing choices, and much more. Participants and their parents live in residence halls for the weekend program. There is a fee for the program that covers room, board, and program costs. Applicants for admission who plan to enroll at UCI in fall quarter will be sent information about SPOP in the spring.

Uni-Prep is a five-day program for entering students held in early September. Participants live in the residence halls and attend workshops and other activities designed to provide them with information about shaping their academic and personal lives at UCI. A fee is charged that covers room, board, and program costs. Applicants for admission who plan to enroll at UCI in fall quarter will be sent information about Uni-Prep in the spring.

Major Campus Publications

Several major publications available on campus provide information about academic programs, student activities and services, enrollment in classes, and specifics pertaining to the

individual departments and schools. Some of these publications are described here; others are listed in *Antidote*, the student handbook published each fall.

The UCI General Catalogue

The *UCI General Catalogue* contains general administrative and academic information, as well as specific descriptions of schools and departments and the courses they offer, degree requirements, major requirements, the UCI breadth requirement, and various academic policies and procedures (see page 15). The Catalogue is published in mid-July, and copies are available by mail and in person. The copies cost \$4.50 each if purchased at the University Bookstore or from University Extension. (See page 351 for the pricing of mailed copies.) Because the Catalogue is prepared well in advance of each academic year, some information in it may not be current. Current information on specific courses offered is available in the *Schedule of Classes* and in quarterly information published by various academic units.

Schedule of Classes

The *Schedule of Classes* contains current information on fees, how to enroll in classes, and final examination schedules. Most importantly, it lists all classes to be offered each quarter and the time, room, and instructor scheduled for each. If there are any enrollment restrictions on the class, such as consent of instructor required, these are noted. Just prior to the first day of instruction for each quarter, the Registrar's Office issues an addendum to the Schedule that lists added and canceled classes; changes in time, instructor, or classroom assignments; and other information.

Because the Schedule is published several times each academic year, it is a timely source of information on new policies and procedures, or changes in fees or procedures, that could not be included in the Catalogue because of the latter's less frequent publication schedule.

Except for the fall edition, the *Schedule of Classes* is published just before the beginning of each quarter; the fall Schedule is available in mid-spring for the convenience of students already attending UCI who will be continuing at UCI in the fall. The Schedule is distributed to new students when Registration Packets are mailed and also is available for purchase from the University Bookstore for 30¢.

Departmental and School Announcements

Publications by schools and academic departments contain information regarding a wide assortment of academic information of immediate, timely interest to students, and all students are strongly urged to read them. The publications come in various forms, from brochures of several pages to one-sheet photocopied announcements, and contain information specific to the individual academic unit. These publications usually are posted on departmental bulletin boards, are available in academic counselors' offices, or can be obtained from departmental offices.

Policies Applying to Campus Activities, Organizations, and Students, Part A

This booklet, available in the Office of the Dean of Students and the Student Activities Office, contains policies and procedures which govern aspects of student conduct and discipline; campus organizations; the use of University facilities; and time, place and manner of public expression for which the University is required to implement campus regulations.

Antidote

Antidote is the student handbook, published in the fall and available (at no cost) while supplies last. A handy resource guide to UCI, it contains a broad spectrum of information for students, ranging from how to obtain a leave of absence to jobs to suggestions for amusement or involvement.

Student-Produced Media

The *New University* is a weekly campus newspaper published by UCI students. Other student-produced media include *East-West Ties*, *The Phoenix*, *La Voz Metiza*, *The Women's Quarterly*, and *The Blade*. In addition, UCI students operate a radio station, KUCI (88.9FM).

UCI Journal

The *UCI Journal* is published bimonthly during the academic year by the University Advancement Office and the UCI Alumni Association. The Journal contains feature stories, commentaries, and other timely reports on UCI research, events, student life, educational policy, and alumni activities as well as a calendar of on-campus events. With a circulation of 70,000, the Journal is the only general-interest publication of UCI that serves members of the UCI community both on and off campus. Copies may be obtained by mail or from media distribution boxes on campus. Further information is available from the Public Information Office; telephone (714) 856-6923.

UCIItems

UCIItems is the campus newsletter and events calendar published biweekly during the academic year by the University Advancement Office. *UCIItems* reports on University and campus policies, accomplishments, and activities as they relate to faculty, students, and staff. Copies are available in media distribution boxes in the Administration Building, Library, classroom buildings, residence halls, and cafeterias. Further information is available from the Public Information Office; telephone (714) 856-6924.

Publications Concerning Campus Services and Activities

Many campus offices that provide services or activities have brochures available describing what they offer. Publications include, but are not limited to, those about available student services such as career planning, health care, housing, and counseling; the announcement of arts and lectures events and School of Fine Arts programs, *UCI Presents*; and the Cooperative Outdoor Program quarterly.

Supplementary Educational Programs

Summer Sessions

Several summer sessions are held on the Irvine campus. Session I is scheduled from June 25 through August 1, 1990. Session II is from August 6 through September 12, 1990. An overlapping 10-week session extends from June 25 through August 31, 1990. Several special sessions also are held, including one for graduate students engaged in research and independent study. Those who enroll in these sessions and take an academic program equivalent to a regular quarter may accelerate their progress toward a degree.

A wide variety of courses from the regular sessions is planned, supplemented by experimental offerings available only during the summer. Admission is open to all university students, to high school graduates, to qualified applicants over 18 years of age, and to qualified high school students

who have completed their junior year. Admission to Summer Session does not constitute admission to a regular session of the University; therefore, official transcripts of educational records are not required. Fees for Summer Session are the same for out-of-State students as for California students.

Information regarding Summer Session is available from the Summer Session Office in the University Extension Building; telephone (714) 856-5493. Application forms and course listings are available in March.

University Extension

University Extension is the unit through which UCI serves the continuing education needs of adults. Extension provides advanced learning opportunities to college-educated and professional people through more than 1,000 credit and non-credit courses, seminars, workshops, conferences, lecture series, and certificate programs.

Courses and certificate programs are offered in a wide range of fields, including microcomputer engineering, hazardous materials management, interior design, legal assistantship, construction management, real estate, executive education, contract management, alcohol and drug counseling, personnel management, marketing communications, financial planning, software systems technology, computers in education, land use and development planning, and State-approved credential programs for educators.

University Extension also provides a means by which community members who are not officially matriculated UCI students may pursue academic interests by participating in a limited number of regular UCI courses. This method, called concurrent enrollment, is available only on a space-available basis with the approval of the course instructors. Applicants for concurrent enrollment must register through the University Extension Registration Office.

Educational and career counseling for adults is available through the Career Counseling and Testing Program and through the Women's Opportunities Center. All University Extension programs are supported by fees charged to students. A free catalogue may be obtained from the University Extension Office, telephone (714) 856-5414.

University Extension Program in English as a Second Language

The Program in English as a Second Language (ESL), sponsored by University Extension, prepares international students to enter and pursue their educational objectives in U.S. colleges and universities. An intensive program in English for academic purposes, it offers core courses in grammar, writing, reading and vocabulary development, seminar reporting and discussion strategies, listening, note-taking, debate and public speaking, and writing the research paper. A variety of elective courses such as TOEFL and GMAT preparation, American history, business and computer English also are available. Requests for information should be addressed to Program in English as a Second Language, University of California Extension, P.O. Box AZ, Irvine, California 92716; telephone (714) 856-5991.

Another ESL program is available to students who have been admitted to UCI. Students should refer to page 41.

ROTC

Although actual ROTC courses are not taught on the Irvine campus, a cross-town agreement allows qualified UCI students to participate in the Air Force Reserve Officers Training Corps (AFROTC), Army Reserve Officer Training Corps

(AROTC), or Navy/Marine Corps Officer Training (NROTC) program. A brief descriptive pamphlet summarizing the programs is available from the Admissions Office, 245 Administration Building.

Air Force ROTC

Through arrangements with California State University, Long Beach; Loyola Marymount University; the University of California, Los Angeles (UCLA); and the University of Southern California, two-, and four-year Air Force Reserve Officers Training Corps (AFROTC) programs are available to all qualified UC Irvine students. Academic units earned in this program are counted as elective units toward fulfillment of UCI graduation requirements. Successful completion of the AFROTC program leads to a commission as an officer in the Air Force. Two-, 2½-, 3-, and 3½-year scholarships are available to qualified students on a competitive basis. Four-year scholarships for incoming students must be applied for before December 1 in the year prior to entering college. All scholarship recipients receive full tuition (UC Educational and Registration Fees), required fees, and a stipend of \$100 per month. Students on scholarship in the first two years of the program must successfully complete a course in English composition and a course in mathematical reasoning within two academic years from scholarship activation. Students who accept a scholarship must agree to successfully complete at least two terms of college instruction in a major Indo-European language prior to commissioning.

Army ROTC

Through arrangements with the Department of Military Science at California State University, Long Beach and The Claremont Colleges Extension office at California State University, Fullerton, two- and four-year Army Reserve Officer Training Corps (AROTC) programs are available to all qualified UCI students. Academic units earned in the program are counted as elective units toward fulfillment of UCI graduation requirements. Successful completion of the AROTC program leads to a commission as a Second Lieutenant in the U.S. Army (Active, Reserve, or National Guard). Two- and three-year competitive scholarships which provide tuition and fee payments at UCI, payment for books, and a stipend of \$100 per month are available to qualified participants. Qualified students currently serving in any Reserve or National Guard unit may transfer to the AROTC program to complete their commissioning requirements. More information is available from the Department of Military Science, California State University, Long Beach, 1250 Bellflower Boulevard, Long Beach, CA 90840; telephone (213) 985-5766.

Navy ROTC

Through arrangements with the Naval Science Department of the University of California, Los Angeles (UCLA), qualified UCI students may enroll in the NROTC Program at UCLA. Successful completion of this program leads to a Commission as an Ensign in the U.S. Navy or as a Second Lieutenant in the U.S. Marine Corps. Academic classes completed as part of the NROTC Program can be transferred and counted as elective units toward graduation at UCI. Qualified students may apply for NROTC competitive scholarships which provide tuition and fee payment at UCI, payment for books, and a stipend of \$100 per month. Applications for NROTC enrollment are accepted during a student's freshman year and until March 15 of the sophomore year. For more information, students should contact the Naval Science Department (NROTC Unit), University of California, Los Angeles; Los Angeles, CA 90024 or telephone (213) 825-9075.

Education Abroad Program

The Education Abroad Program (EAP) of the University of California offers upper-division students the opportunity to experience a different culture while making progress toward degree objectives. EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world.

Admission of University of California undergraduate students is subject to the following qualifications: a minimum 3.0 cumulative grade point average at the time of application; junior standing by departure (except for specific short-term programs); completion of language courses as required, with an overall minimum grade point average of 3.0 or the equivalent; and the recommendation of the Campus EAP Selection Committee.

Students interested in the language, literature, art, culture, history, government, or social institutions of the countries where EAP study centers are located have the opportunity to gain substantially from first-hand academic experience. In addition, whatever their field of study, EAP participants can broaden their outlook and gain new skills as the result of study in a foreign country. Study abroad allows students to experience vastly different cultures and contrasting patterns of thinking while making progress toward a UC degree.

The cost of studying abroad through EAP is comparable to the cost of studying at UCI. EAP participants are responsible for UC registration and educational fees, campus fees, and room, board, books, and personal expenses. The only additional costs directly related to the Program are for round-trip transportation and vacation travel, and personal expenses beyond what normally would be spent at home. Most University of California financial aid, including grants, scholarships, and loans, is available to EAP students who qualify. Most EAP participants going to Pacific-region countries receive UC scholarships which are awarded on a merit basis.

Normally, students participate in EAP during their junior year, so application for EAP usually is made in the sophomore year. However, students may apply for participation as fourth- or fifth-year seniors or as second-year graduate students. Students interested in EAP should contact the EAP Office early in the fall quarter concerning application deadlines.

Application forms are available in the EAP Office, located in Student Services II, Suite 1010; telephone (714) 856-6343.

Academic Program

Generally, EAP students attend courses taught by faculty of the host university in the language of the host country; thus, language skills are very important. The academic program includes (1) an intensive preparatory course in the language of the host country (this does not apply to programs in the United Kingdom, Ireland, Australia, New Zealand, Egypt, Canada, Hungary, India, and Kenya, in which English is the primary language); (2) a full year of academic courses; and (3) opportunity to audit courses within the host university. Students may go to Denmark, Norway, or Sweden with no prior knowledge of these languages, but must spend the summer in intensive language programs which prepare them in the language for the academic year. Students may go to Israel with no knowledge of Hebrew, although prior study of the language is recommended. Students are expected to complete a minimum of 36 units during the academic year in addition to units earned in the intensive language program.

Although units and grade points earned through the EAP are incorporated into the participant's University transcript and

grade point average, the academic unit in which the participant's major is offered determines which EAP courses will be accepted in satisfaction of requirements for the specific major. A number of majors require that certain key upper-division courses be completed in residence at UCI.

EAP participants who satisfy all degree requirements while abroad and who expect to graduate upon completion of their year abroad should file for candidacy to receive their degree in September because, unfortunately, transcripts from abroad take time to reach the home campus and are not received in time for EAP returnees to be included on the June degree list. Such returnees, however, may participate in June Commencement.

Study Centers

The courses and fields of study open to EAP participants vary at each center, and some vary from quarter to quarter. Each of the host universities has special areas of excellence and strength. Detailed information about each center is available in descriptive brochures for each country. They are available from advisors in the EAP Office. Below is a list of countries and universities participating in the EAP:

Australia: University of Melbourne, Monash University (Melbourne); LaTrobe University (Melbourne); The Australian National University (Canberra); Macquarie University, University of Sydney, University of New South Wales (Sydney); University of Adelaide, Flinders University of South Australia (Adelaide)

Austria: University of Vienna

Brazil: University of São Paulo

Canada: University of British Columbia (Vancouver)

China: Peking University, Nanjing University, University of Science and Technology (Beijing)

Costa Rica: The University of Costa Rica (San Jose), Monteverde Institute

Denmark: University of Copenhagen

Egypt: The American University of Cairo

England: University of Birmingham, University of East Anglia, University of Exeter, University of Hull, University of Kent, University of Lancaster, University of Leeds, University of Sussex, University of York

France: University of Bordeaux, University of Grenoble, University of Lyon, Paul Valéry University (Montpellier), University of Paris, University of Pau, University of Poitiers

Germany: Georg-August University (Göttingen)

Hong Kong: Chinese University of Hong Kong

Hungary: Karl Marx University of Economics (Budapest)

India: University of Delhi

Indonesia: Padjadjaran University, Indonesia Dance Institutes of Bali and Bandung; Gadjah Mada University, Indonesia Institute of the Arts (Yogyakarta)

Ireland: University of Dublin (Trinity College); University College, Galway; University College, Cork

Israel: Hebrew University (Jerusalem)

Italy: University of Bologna, G.B. Martini Music Conservatory (Bologna), The Bisonte International School of Graphic Arts (Florence), University of Padua, University of Venice, Venice Academy of Fine Arts

Japan: International Christian University and Sophia University (Tokyo), Meiji Gakuin University (Yokohama), Tokyo Institute of Technology (engineering students)

Kenya: University of Nairobi

Korea: Yonsei University (Seoul)

Mexico: National Autonomous University of Mexico (Mexico City), San Nicolas de Hidalgo University of Michoacan (Morelia)

New Zealand: The University of Auckland, Lincoln College (Christchurch), University of Otago (Dunedin), Massey University (Palmerston North), Victoria University of Wellington

Norway: University of Bergen

Peru: Catholic University of Peru (Lima)

Portugal: University of Lisbon

Scotland: University of St. Andrews, University of Stirling

Spain: University of Barcelona and University of Madrid

Sweden: University of Lund

Taiwan: National Chengchi University (Taipei)

Thailand: Chulalongkorn University (Bangkok), Chiang Mai University (Chiang Mai)

Togo (West Africa): University of Bénin (Lomé)

U.S.S.R.: Leningrad State University

Wales: University College of Wales (Aberystwyth)

Most of the programs listed above are for a full academic year, however, some of the programs are for one semester or for two years.

International Opportunities Program

The International Opportunities Program (IOP), a new program administered by the Office of the Dean of Undergraduate Studies, is designed to help students explore the wide range of opportunities available for going abroad. These include programs of study, intensive language training, work, volunteering at home and abroad, internships, service/learning, and research. Funding support and/or academic credit is available for some of these programs. The IOP also offers assistance in locating and applying for a number of foreign scholarships and fellowships. Additional information is available from the IOP; telephone (714) 856-8657.

Education at Home Program

In winter quarter the University's Riverside campus will continue the Education at Home Program (EHP) for those students with special interest in early American history and culture. Those selected for participation in this program will spend nine weeks in Williamsburg, Virginia; one in Philadelphia; and a concluding week in Washington, D.C. The program is open to all undergraduates from all campuses in the University of California system. With the prior approval of their graduate advisor, graduate students also may apply. Participants register for three courses through the Riverside campus' Department of History (History 157, 158, 159). Special arrangements for additional independent study (maximum of four units) may be made with the student's home campus. Costs for housing, food, and transportation are the individual participant's responsibility. Further information, brochures, and an application form is available from the Education at Home Program Office; telephone (714) 787-3820. Preference is given to applications received by June 30; final application deadline is November 1.

Academic Regulations and Procedures

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning academic regulations applying only to graduate students is given in the Graduate Studies and Research section.

Student Academic Records

Student's official academic records are maintained permanently by the Registrar and are used for purposes such as academic advising, scholarship awards, admission to professional or graduate schools, and future employment.

Each student is responsible for carefully examining their enrollment and academic records and may do so throughout the academic year. Students must promptly notify the Registrar's Office if they find a discrepancy in their records.

Since all data entries for each student's current quarter class enrollment are put directly into the academic record system from source documents completed by the student, it is extremely important for each student to complete these source documents (e.g., Enrollment in Classes Petition and Add/Drop/Change cards) carefully and accurately.

Student academic records may not be changed after one year or, in some cases, in less than one year if Academic Senate regulations specify a shorter time limit. For example, the notation "NR," which means that no grade has been reported, must be removed within one quarter of subsequent enrollment or it will automatically be converted to the grade "F" or "NP" (under Senate Regulation IR 345).

Grading System

- A** — Excellent (4.0 grade points per unit)
- B** — Good (3.0 grade points per unit)
- C** — Average (2.0 grade points per unit)
- D** — Lowest passing grade (1.0 grade point per unit)
- F** — Not passing (no grade points)
- I** — Incomplete
- P** — Pass (equal to grade C or better)
- NP** — Not Pass
- S** — Satisfactory (equal to grade B or better; graduate students only in courses so designated by the Graduate Council)
- U** — Unsatisfactory (graduate students only in courses so designated by the Graduate Council)
- IP** — In Progress (restricted to certain sequential courses, so designated by the Committee on Courses, for which the final quarter grade of a multiquarter sequence course is assigned to the previous quarter(s) of the sequence)
- NR** — No Report (given when an instructor's final grade course report is not submitted or when the student's name was on the official class roster but the instructor did not report a grade for the student; NR becomes an F or NP after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. The instructor, at the student's request, may replace an NR with a grade within one quarter of subsequent enrollment or may authorize the student to drop the class, which would result in the NR becoming a W).
- UR** — Unauthorized Repeat. A UR notation is recorded for the grade when a student already has a passing grade for

a nonrepeatable course and has repeated the course again.

- W** — Withdrew. A W notation is recorded on a student's permanent record for each course a student drops after the end of the sixth week of instruction in a quarter. Courses in which a W has been entered on a student's record will be disregarded in determining the student's grade point average and will not be considered as courses attempted in assessing the student's satisfaction of the normal progress requirement.

Plus suffixes may be attached to the grades B, C, and D; minus suffixes may be attached to the grades A, B, C, and D. Plus grades carry three-tenths grade point more per unit, and minus grades carry three-tenths grade point less per unit than unsuffixed grades.

Requirements for a bachelor's degree include the accumulation of credit for 180 quarter units with an average of at least C (grade point average of at least 2.0). A course at UCI normally offers four quarter units of credit, and, in the following text, the term "course" may be understood to carry four units. The grade point average is the sum of all accumulated grade points (grade points earned in a course taken for a letter grade *times* the unit value of the course) divided by the sum of all units attempted.

It should be noted that final grades as reported by professors are normally permanent and final. A professor may not change a final grade except to correct a clerical or procedural error. Clerical or procedural errors should be corrected within one regular academic quarter after the grade is assigned. Under circumstances explained in the Academic Grievance Procedures (Manual of the Irvine Division of the Academic Senate, Appendix II), a grade may be changed if the Academic Grievance Panel has determined that the grade was assigned on the basis of discrimination.

Incomplete Grades

An I or Incomplete grade is assigned to a student by an instructor when the student's work is of passing quality but is incomplete because of circumstances beyond the student's control, and when the student has been temporarily excused by the instructor from completing the quarter's work.

For currently enrolled students, the maximum time limit for making up an I grade is three quarters of enrollment. After this time the I grade can no longer be replaced and will appear permanently on the record. The student should consult the instructor to determine how the Incomplete may be made up. *The instructor is not obligated to allow the maximum three-quarter period.* It is strongly recommended that the student and the instructor prepare a written agreement specifying how the Incomplete can be made up and the deadline for doing so. Once the work is completed within a time agreed upon by the instructor, the student should ask the instructor to submit a change of grade form to the counseling office of the school in which the course was offered. The student should *not* reenroll in the course to make up the Incomplete.

Students not currently enrolled at UCI have a maximum of one calendar year in which to replace an Incomplete grade. However, in exceptional individual cases involving the student's prolonged inability to pursue a course of study, extensions of up to two additional years may be granted by the instructor with the approval of the dean of the unit offering the course; students must petition for such an extension within one calendar year following the assignment of the Incomplete grade.

Courses graded I carry no grade points and are not included in computation of the grade point average which appears on the student's permanent record. Any I grade will remain indefinitely on the permanent record unless the work is completed and a grade assigned as described above.

University of California regulations require a grade point average of 2.0 for all units attempted in order to receive a bachelor's degree. *Only when a check for satisfaction of graduation requirements is made are I's treated as F's.* If the student's overall average is at least a 2.0, including the Incomplete grades computed as F's, then the student may graduate. If the Incomplete grades computed as F's decrease the student's average below a 2.0, the student may not graduate until enough I grades have been made up to bring the average up to a 2.0 and this must be done within the time limits specified above.

Pass/Not Pass

The Pass/Not Pass option is available at UCI to encourage students to enroll in courses outside their major field. Courses graded Pass or Not Pass are not included in computation of the grade point average which appears on a student's permanent record. However, if a student receives a Pass in a class, course and unit credit for the class is received, except as provided below. If a Not Pass is received, the student receives no credit for the class.

The use of Pass/Not Pass is governed by all of the following provisions:

1. A student in good standing may take up to an average of four units per quarter on a Pass/Not Pass basis. However, candidates for the bachelor's degree may take a total of 12 more units in courses designated by academic units as Pass/ Not Pass Only.
2. A student who earns a grade of C (2.0) or better will have a Pass/Not Pass grade recorded as Pass. If the student earns a grade of C- or below, the grade will be recorded as a Not Pass, and no unit credit will be received for the course. In both cases, the student's grade will not be computed into the grade point average.
3. Courses taken under the Pass/Not Pass option may count toward the 180-unit requirement for the bachelor's degree and toward the breadth requirement. With the exception of courses designated Pass/Not Pass Only, courses taken Pass/ Not Pass may *not* be used to satisfy specific course requirements of the student's school and major, unless authorized by the appropriate dean. No more than two courses applied to a minor may be taken Pass/Not Pass.

Graduate students may take one course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program, may not be applied to the requirements for an advanced degree, and do not count toward the minimum number of units for which a graduate student must enroll.

4. Changes to or from the Pass/Not Pass option must be made during the enrollment period. No changes can be made after the first two weeks of classes without the approval of the dean of the student's school. No changes in the Pass/Not Pass option can be made after the last day of instruction of the quarter.
5. A student on academic probation may not enroll in a course with the Pass/Not Pass option unless the course is offered on that basis only.

Satisfactory/Unsatisfactory Grades (Graduate Students Only)

Satisfactory/Unsatisfactory grading, unlike Pass/Not Pass, is not a student option. With the consent of the academic units involved, individual study and research or other individual graduate work undertaken by a graduate student may be evaluated by means of the grades S or U. Certain graduate courses are graded S/U only. Also, the grade S or U may be assigned provisionally in each but the last quarter of a graduate course extending over more than one quarter. Upon completion of the last quarter, letter grades (A to F) replace such provisional grades. When a grade of S or U has been assigned on a provisional basis and the student does not complete all quarters of the course sequence, the instructor may assign a final letter grade or the grade of I to replace the S or U, or let the grade of S or U stand as a final grade. With the specific approval of the Graduate Council, other graduate courses may be graded on an S/U basis provided that each student enrolled in such a course receives a grade of S, U, or I (or if an undergraduate student, a grade of P or NP).

The grade S is defined as equivalent to a grade of B (3.0) or better. No credit will be allowed for work graded Unsatisfactory.

Grades In Progress

IP is a transcript notation, restricted to sequential courses which extend over two or more quarters, indicating that the final grade for the individual quarters will not be assigned until the last quarter of the sequence is completed. The grade for the final quarter is then assigned for all of the previous quarters of the sequence. No credit is given until the student has completed the entire sequence. IP notations may be given only for courses designated by the Academic Senate Committee on Courses for use of this notation. IP notations are not included in computations of the student's grade point average and do not contribute to the number of quarter units completed.

Grades Not Reported

A student who receives an NR must immediately contact the instructor and arrange for the removal or replacement of the NR. An NR becomes an F or NP after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. NR transcript notations are not included in computations of the grade point average and do not contribute to the number of quarter units completed.

Grade Points and Grade Point Average

Grade points are assigned on a four point basis: A, 4 points per unit; B, 3 points per unit; C, 2 points per unit; D, 1 point per unit; F and I, zero points. Plus or minus suffixes modify the above by plus or minus 0.3 grade point per unit.

Each undergraduate course counts one through eight units, and graduate courses range from one to 12 units each (see departmental course descriptions). Grade point average (GPA) is computed by dividing the total number of grade points earned by the total unit value of courses attempted. P, NP, S, U, NR, IP, and I grades are excluded in computing grade point average.

Repetition of Courses

Undergraduates may repeat courses only when grades of C-, D+, D, D-, F, or NP were received or when the course has been approved for repetition. (A C- earned before fall quarter, 1984, is *not* repeatable.) Degree credit for courses so repeated will be given only once, but the grade assigned at each enrollment shall be permanently recorded. In computing the grade point average of an undergraduate with repeated courses in which a C-, D+, D, D-, F, or NP was received, only the most recently received grades and grade points shall be used for the first 16 units repeated. In case of further repetitions, the grade point average shall be based on all additional grades assigned.

All courses which were originally taken for a letter grade must be repeated for a letter grade. Courses originally taken on a Pass/Not Pass basis may be repeated for a Pass/Not Pass or for a letter grade if the course is so offered.

A graduate student may repeat only once a course in which a grade below B or a grade of U was received. Only the most recently earned grade shall be used in computing the student's grade point average for the first eight units of repeated work; thereafter both the earlier and the later grades will be used.

If a student repeats a course for which a passing grade has already been received and the course is not approved as repeatable for credit, the student will receive a UR and no credit will be given.

Satisfaction of the Writing Requirement

Once a student matriculates to UCI, the student can take only UCI courses in satisfaction of the lower- and upper-division writing requirements.

The two courses taken to fulfill the lower-division Writing requirement must be completed with a grade of C or better. The following applies to students who fail to attain a grade of C or better in the lower-division courses:

1. Students who fail to attain a grade of C in one or both courses of the English and Comparative Literature WR39B-C sequence must repeat the course or courses in question.
2. Students who fail to attain a C in Humanities 15 normally should enroll in English and Comparative Literature WR39B; students who fail to attain a C in Humanities 16 should normally enroll in English and Comparative Literature WR39C. Alternatively, a student who fails to attain a C in either Humanities 15 or 16 may repeat these courses with the permission of a faculty advisor or academic counselor.
3. Students who fail to attain a C in at least two quarters of the writing component of the Humanities Core Course after satisfying the Subject A requirement should substitute English and Comparative Literature WR39C if they need one quarter of additional work to complete the requirement, or English and Comparative Literature WR39B-C if they need two quarters to complete the requirement.

The course taken to fulfill the upper-division requirement must be completed with a grade of C or better. The following applies to students who fail to attain a grade of C or better in the upper-division course:

Students who fail to attain a grade of C in English and Comparative Literature WR139W should repeat it. Students following any other approved upper-division option should

enroll in English and Comparative Literature WR139W if a C is not attained in the selected course.

See page 54 for further information on the Writing requirement portion of the breadth requirement.

Credit by Examination

An enrolled student may obtain credit for many courses by taking a special examination administered by a faculty member who normally teaches that course. Detailed procedures for obtaining credit by examination may be obtained from the office of the dean of the school which offers the course. Approval of any petition for credit by examination must be obtained from the dean of that school *before* the examination can be administered. After the dean has signed the petition, the student must have it validated by paying a \$5 Credit by Examination Fee at the Cashier's Office.

The instructor giving the examination retains the prerogative (1) to decide whether the course can be taken by examination, (2) to determine the form such an examination may take, and (3) to stipulate whether the grade will be reported as Pass/Not Pass or as a letter grade (e.g., A, B, C, etc.).

A student may take the examination for a particular course only one time. After receiving the grade, the student may accept it or reject it. If the student is not satisfied with the grade received on the examination, the student may choose not to receive credit or a grade. If the student does choose to accept the results of the examination, grades and grade points (if applicable) will be entered on the record in the same manner as those for regular courses of instruction.

Independent Study: Undergraduates Only

Another class option is available *primarily to upper-division students at UCI*. The independent-study option allows the student to plan with the instructor a course having a clear relationship to the student's academic program. The plan for the course will include a reading list, a group of assignments, examinations, papers, or similar evidence of intellectual achievement on which academic credit will be based. A description of the course and of its requirements must be approved by the instructor responsible for it and by the department chair or dean. Independent-study credit for undergraduates is limited to five units per quarter.

Final Examinations

Final examinations are obligatory in all undergraduate courses except laboratory and studio courses, or their equivalent, as individually determined by the Committee on Courses. Normally each such examination shall be conducted in writing and must be completed by all participants by the announced time shown in the Schedule of Classes for the quarter in question. These examinations may not exceed three hours duration. In laboratory and studio courses, the department concerned may at its option require a final examination subject to prior announcement in the Schedule of Classes for the term. Special arrangements may be made for disabled students.

Final grade reports from professors are due in the Registrar's Office within 72 hours after the final examination.

Student Copies of Quarterly Grades

After each quarter, a copy of the student's permanent record is available from the Registrar's Office. On the copy, the student will find grades for all the quarters taken at UCI, a computation of grade point average at the University of California, and a list of the University requirements completed (Subject A, American History, and American Institutions).

Undergraduate Scholarship Requirements

Requirements for a bachelor's degree include the accumulation of credit for 180 quarter units with an average of at least C (grade point average of at least 2.0).

Class Level

Undergraduate students are classified as freshman, sophomore, junior, or senior students, based on the total number of units acquired, as follows:

Freshman	0 — 40.4
Sophomore	40.5 — 83.9
Junior	84.0 — 134.9
Senior	135.0 — 180.0

Course Load Limits

An undergraduate may enroll in as few as 12 units or as many as 20 units. To enroll for more than 20 units or fewer than 12 units a student must obtain the signature of the student's dean on the Enrollment in Classes Petition. Any action to add or drop courses after submission of the Enrollment in Classes Petition which will cause a student to be enrolled in more than 20 units or fewer than 12 units requires approval by the student's dean. This approval is certified by the dean's signature on the Add, Drop, or Change of Grading Option Card, as appropriate.

Students in the part-time study program are referred to page 43.

Academic Standing

To remain in good academic standing a student must maintain a grade point average of at least 2.0 and make progress toward the degree at a satisfactory rate.

An undergraduate student normally is subject to academic probation if at the end of any quarter the grade point average for that quarter, or the cumulative grade point average, is less than 2.0.

A student whose grade point average falls below a 1.5 for any quarter, or who after two consecutive quarters on probation has not achieved a cumulative grade point average of 2.0 or a satisfactory rate of progress, is subject to disqualification.

Normal Progress Requirement

Regular undergraduate students will become subject to probation or subject to disqualification from further registration in the University if they fail to make normal progress toward the baccalaureate degree.

1. Normal progress for all regular undergraduate students is defined in the following table, in terms of quarter units completed at the end of quarters enrolled.

Quarter	Normal Progress	Subject to Probation	Subject to Disqualification
1	12-15	8-11	7
2	24-30	16-23	15
3	36-45	24-35	23
4	50-60	40-49	39
5	65-75	56-64	55
6	80-90	72-79	71
7	96-105	89-95	88
8	112-120	106-111	105
9	128-135	124-127	123
10	145-150	142-144	141
11	162-165	160-161	159
12	180	—	—

2. A student who at the end of a given quarter of enrollment has completed the number of units in the range specified in the "Normal Progress" category under (1) is making normal progress. A student who at the end of a given quarter of enrollment has completed a number of units in the range specified in the "Subject to Probation" category under (1) is subject to being placed on probation by the faculty of that student's school or program or its designated agent. A student who at the end of a given quarter of enrollment has completed no more than a number of units in the range specified in the "Subject to Disqualification" category under (1) is subject to disqualification by the faculty of that student's school or program or its designated agent.
3. Students who have completed two consecutive quarters on academic probation without having achieved at the end of that period at least the normal rate of progress specified under (1) are subject to disqualification.

A student will be allowed to continue on probation only if the record indicates likely achievement of the required scholastic standing within a reasonable time.

4. For purposes of calculating "Normal Progress," "Subject to Probation," and "Subject to Disqualification," students admitted to the University with advanced standing will be classified with respect to quarter of enrollment at entrance in accordance with the following table:

Quarter at Entrance	Advanced Standing Quarter Units at Entrance
1	0-14
2	15-29
3	30-44
4	45-59
5	60-74
6	75-89
7	90-104
8	105-119
9	120-134
10	135-149

5. Units earned under the following three circumstances are not to be counted toward determination of the quarter at entrance under (4) above: (a) Advanced Placement Examination; (b) College Level Examination Program; (c) concurrent enrollment in college courses while in high school.
6. The quarter of enrollment at entrance of students (including baccalaureate degree candidates who already hold a baccalaureate degree) seeking admission to the University with 150 or more advanced standing units will be determined by the faculty offering the curriculum in which such students seek to enroll. This determination will be made consistent with the program required for such students to obtain the desired degree and with University residence requirements.
7. The Normal Progress requirement described above is not to be confused with the Normal Academic Progress requirement for Financial Aid. The former has to do with academic standing, the latter with receipt of financial aid.

Probation is not a necessary step before disqualification. If a student becomes subject to disqualification, the complete record of grades and other accomplishments will be carefully reviewed by the responsible faculty authorities of the student's school. If the record indicates little probability that the student will be able to meet the academic standards of the University of California, the student will be disqualified from

further enrollment. Each school and program is obliged by Academic Senate regulations to maintain a procedure under which a student may appeal probation and disqualification actions.

In order to transfer from one campus to another in the University of California or from one UCI school to another, a student who has been disqualified or who is on academic probation must obtain the approval of the appropriate faculty, or its designated agent, into whose jurisdiction the student seeks to transfer.

Honors

Information about the Campuswide Honors Program and the major-specific honors programs available at UCI is found on page 51.

Quarterly Undergraduate Honors

Quarterly undergraduate honors are awarded in each school to students who achieve a quarterly grade point average of 3.5 or better in a minimum of 12 graded units.

Honors at Graduation

Students may graduate with honors, *summa cum laude*, *magna cum laude*, or *cum laude*. The criteria used by each school in selecting candidates for these honors are included in each school's section of the Catalogue. A general criterion is that students must have completed at least 72 units in residence at a University of California campus.

Graduate Scholarship Requirements

For a graduate student, only the grades A, A-, B+, B, and S represent satisfactory scholarship. Information concerning graduate student course load requirements and satisfactory academic progress is given in the Research and Graduate Studies section.

Enrollment in University Extension

If a UCI student wishes to enroll in a University Extension course concurrently with enrollment in regular courses, the entire program of study must be approved in advance by the dean of the student's school (in the case of graduate students, by the Dean of Graduate Studies).

Credits From Other Institutions or University Extension: Undergraduate Students

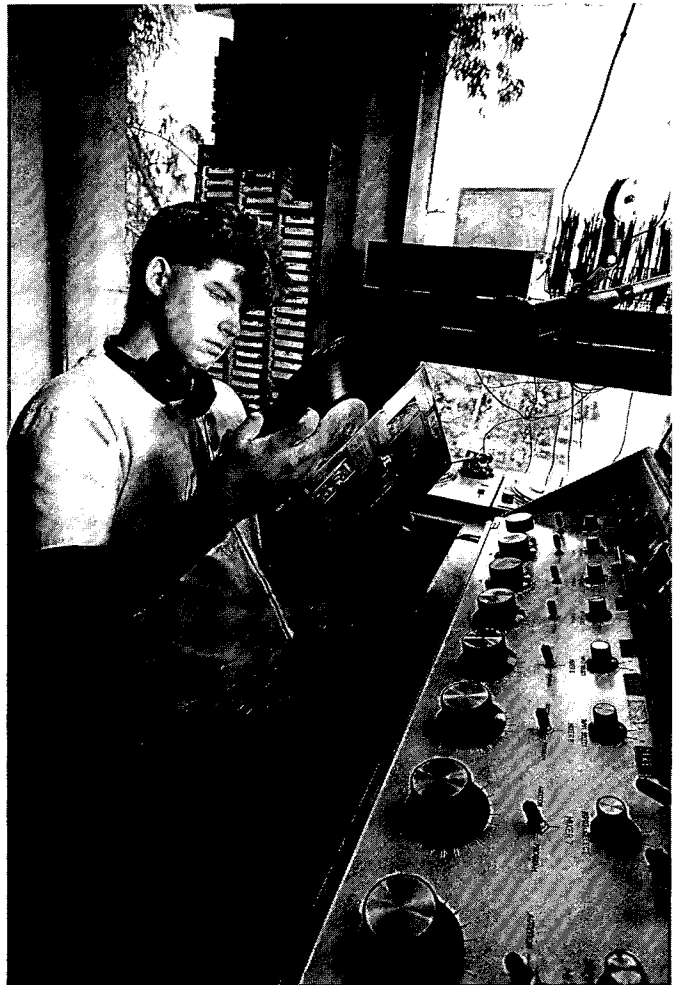
UCI undergraduate students who wish to enroll in courses at another institution in either a summer or regular session and to use such courses to satisfy any UCI requirements should secure prior approval from the Office of Admissions and their academic dean. The Office of Admissions is responsible for determining if these credits are transferable to UCI, and the academic dean or director of the academic unit which offers the student's major is responsible for determining if the credits are applicable to major and breadth requirements.

If such courses are determined by the Office of Admissions to be transferable, and if such courses do not duplicate other credit granted and do not exceed limitations of credit, then the units earned may be applied toward the total required for graduation.

Forms for securing such authorization are available in the Office of Admissions and in deans' offices.

Credits From Other Institutions or University Extension: Graduate Students

Graduate students may be granted unit credit (not grade credit) toward a master's degree for acceptable graduate-level



KUCI (88.9 FM), the student-operated campus radio station, provides a variety of entertainment for listeners, from classical to new age music, talk shows, and special programming.

courses completed at another institution or through University Extension prior to first enrollment in graduate study at UCI. To receive such credit, the student must initiate a formal petition after enrollment in graduate study. Approval of the student's graduate advisor and the Dean of Graduate Studies is required.

While enrolled at UCI or on a Leave of Absence a graduate student may receive unit credit for graduate-level courses completed at another institution or through University Extension only with the prior approval of the student's graduate advisor and the Dean of Graduate Studies.

See the Research and Graduate Studies section for further information about graduate transfer credit and the University's Intercampus Exchange Program.

Program of Academic Support Services

The Program of Academic Support Services (PASS) is a campuswide academic assistance program focused on helping students develop and improve their skills and knowledge in

academic courses. Although PASS programs are not offered for credit, they are developed in coordination with academic departments. Presented in a coherent, pedagogically sound, and enriching manner, these programs are intended to meet the individual needs of all UCI students. For example, programs are available to students who desire greater academic proficiency in courses ranging in level from introductory through honors and upper division. Students who desire assistance have the opportunity to find a PASS program that is suited to their needs and that will make their education at UCI more successful and rewarding. Some of the major PASS programs are described below.

The **Learning Skills Center** provides programs designed to help students strengthen and develop their reading, writing, mathematics, science, analytic thinking, and study skills in order to enrich and enhance their education at UCI. Some Learning Skills programs are neither discipline- nor course-specific, but stress the development of abilities that all students need regardless of field or major. Such programs include workshops and individual counseling in writing, time-management, overcoming procrastination, listening and note-taking, test-taking, and preparation for the graduate entrance examinations. Classes in critical reading are also offered.

The Center offers a program of course-related adjuncts in conjunction with designated introductory courses in writing, humanities, chemistry, mathematics, and the social sciences. These adjuncts, coordinated with regular course instruction, provide an opportunity for students to improve their academic skills in specific courses.

The objective of the **Tutorial Assistance Program (TAP)** is to aid undergraduate students in comprehending and retaining course-specific subject matter and in developing the understanding necessary for successful independent learning. Through small-group tutorials, TAP activities are designed to encourage student confidence and to cultivate, by maximizing a student's participation, his or her ability to work with and articulate aspects of the course. Tutoring is available in the following disciplines: the biological sciences, chemistry, computer science, engineering, the humanities, mathematics, physics, social ecology, and the social sciences.

The **PASS Writing Workshops** seek to provide in-depth writing assistance of a focused and methodical nature to students who may find English and Comparative Literature WR39A difficult because of insufficiencies in their University preparation. This assistance, furnished to newly admitted students, addresses specific compositional weaknesses and endeavors to provide students, at an early stage of their coursework, with necessary verbal skills. Assistance is given in the form of workshops attached to special sections of English and Comparative Literature WR39A. The Writing Workshops enable instructors to give intensive and individualized attention to students.

Placement examinations are given in English as a second language, reading, chemistry, precalculus, and college algebra. Test results provide students with information about their academic preparation before they enroll in classes. This information helps them formulate effective plans of study and enroll in classes for which they have the necessary preparation. Further information is available on page 25. See page 52 for further information on the Universitywide Subject A Examination.

Campus Life and Student Activities

Arts and Lectures

Each year the Arts, Lectures, and Student Affairs Communications Office brings guest performing artists and lecturers to the campus. Such cultural programs are designed to complement the classroom experience of students, provide programs of interest to the public, and stimulate community interaction through cultural, social, and political discussion. During the 1988-89 academic year, lecturers included authors William F. Buckley and Dr. Haing Ngor, anthropologist Richard Leakey, and humorist Mark Russell. Cultural programs featuring performing artists included performances by the Oakland Ballet, Harry James Big Band, and the Shanghai Acrobats and Magicians. Program information is available from the Office; telephone (714) 856-6379.

Other services of the Office include the Student Speakers Forum, the University Speakers Bureau, and the UCI Entertainment Registry. The Student Speakers Forum is composed of outstanding undergraduate and graduate student speakers who make presentations about their research, faculty-directed studies, creative activities, and student leadership experiences. Forum participants share these experiences with community and civic organizations, and with high school and community college classes. The University Speakers Bureau is composed of more than 200 faculty and staff who are available to speak about UCI's research and scholarly activities as part of the University's public service commitment to the community. Information about both groups is available from the Office; telephone (714) 856-7737. The UCI Entertainment Registry is comprised of talented students, staff, and faculty entertainers who perform on campus and in the community. Information about the Registry is available from the Office; telephone (714) 856-5588.

Bren Events Center

The Bren Events Center is the largest facility on campus, seating 6,000 for concerts, lectures, convocations, theatre, and musical productions, and 5,000 for spectator sports such as basketball and volleyball. The majority of the funding for the payment of the Center's construction costs comes from a student-approved quarterly student fee. Both the Center and its two meeting rooms are available to campus and off-campus users. Further information is available from the Bren Center Director; telephone (714) 856-5050. The Events Center ticket office, which handles ticket sales for most campus events, is open from 9 a.m. to 5 p.m. Monday through Friday; telephone (714) 856-5000.

Campus Recreation

The Campus Recreation Program provides students, faculty, and staff with the opportunity to participate in intramural activities, sport clubs, fitness, informal recreation, and non-credit instruction. Emphasis is on participation, and activities are offered at all ability levels from novice to advanced. Information regarding specific activities is available in the Department of Athletics and Physical Education section.

Cross-Cultural Center

The Cross-Cultural Center offers a friendly atmosphere and supportive environment for the ethnic minority community at UCI. It provides office space and serves as "home base" for nearly 30 registered ethnic organizations. Center facilities include a conference room for group meetings, a lounge for socializing, a study room, and a graphics production area. In addition, the Center has a job board that lists educational and

career opportunities and a resource library. The annual Rainbow Festival, a two-day program that recognizes and reinforces UCI's commitment to cultural diversity, is one of the major programs administered by the Center. The Center also supports a variety of annual special events such as Black History Month, Asian Week, Cinco de Mayo, and the Third World Holiday Feast. In addition, the Center sponsors a faculty-student mentorship program and other activities designed to support the educational, cultural, and leadership development of ethnic minority students. Additional information is available at the Center; telephone (714) 856-7215.

Speech and Debate Team

The Speech and Debate Team offers students opportunities to compete with students from other universities and colleges in intercollegiate speech and debate tournaments. Other activities include public speaking, oral interpretation, and Readers Theatre presentations to campus and community audiences. In addition, the School of Humanities offers two courses (Humanities 60 and 61) on the principles of communication and their application to speaking. Further information is available from the Director, Speech and Debate Team; telephone (714) 856-8780.

Student Activities Office

The Student Activities Office provides advisement and support services for nearly 200 registered campus organizations. These groups encompass a wide range of interests including academic, environmental, international, minority, political, recreational, religious, service, and social. Professional and student staff provide information on event planning, publicity, funding and fund-raising, alcohol and substance abuse, and campus regulations and policies.

Sorority and fraternity advising services are provided to UCI's 25 Greek organizations. Staff support is provided for Rush, Pledge Presents, Greek Week, Songfest, and other fraternity and sorority activities.

To aid students in becoming more effective leaders, the Student Activities Office offers a variety of programs and services. These include the All-University Leadership Conference, a weekend program for emerging and established student leaders; informal "how to" workshops addressing such topics as communication skills, time management, goal setting, and team building; University Affairs for Credit, a 1.3-unit course available to students who undertake a significant campus project intended to enrich their academic growth; and various publications and resources intended to challenge students to become more productive in their leadership roles.

The Student Activities Office also administers a host of other programs: Orientation Week Fair, Mardi Gras, Presidents' Dinner, College Bowl Tournament, Campus Organization Day, and Student Organization Recognition Night. Additional information about any of these programs is available from the Office; telephone (714) 856-5181.

The **Cooperative Outdoor Program (COP)** is another component of the Student Activities Office. The COP schedules approximately 150 outings and seminars annually. These cover a wide range of activities including backpacking, hiking, canoeing, kayaking, rock climbing, skiing, and bicycling. The **Wilderness Warehouse**, an adjunct to COP, provides the campus community a full line of outdoor rental equipment, retail accessories, and a complete bicycle maintenance service, including the sale of new bicycles. A wheelchair repair service also is available. For information regarding services and business hours, telephone the Wilderness Warehouse Office at (714) 856-6212. The Office also sponsors various credit and

noncredit opportunities for those interested in environmental education topics and issues. These range from actual courses and independent research projects to seminars, lectures, and films.

Registered Campus Organizations

Academic Groups

Alpha Epsilon Delta Premedical Honor Society
American Institute of Aeronautics and Astronautics (AIAA)
American Society of Mechanical Engineers, Student Chapter
Asian Medical Student Association
Asian Students for Health Sciences Club
Associated General Contractors
Associates for Computing Machinery
Black Students in Science Organization
Black Students in Social Sciences Organization
Chicanos for Creative Medicine
Chi Epsilon
Chinese Pre-Health Student Association
Delta Delta
Dental Club at UCI
Economics Students Association
Engineering Students' Council
English Club
Eta Kappa Nu
Eta Sigma Phi
German Club
Global Peace and Conflict Studies
Golden Key National Honor Society
Graduate School of Management Student Association
Institute of Electrical and Electronics Engineers (IEEE)
Institute of Transportation Engineers
Korean Health Association
Math Club
Medspur
Mexican-American Engineering Society
National Society of Black Engineers
Phi Alpha Delta Pre-Law Fraternity
Phi Delta Epsilon
Pre-Law Society
Psychological Students' Association
Russian Club
Society of Women Engineers
Student National Medical Association (SNMA)

Tau Beta Pi
Undergraduate Business Association
USEE-EYES

Environmental Groups

Environmental Coalition at UCI
Friends of the San Joaquin Freshwater Marsh
Labwatch at UCI

Greek Groups

Alpha Chi Omega (Sorority)
Alpha Epsilon Pi (Fraternity)*
Alpha Epsilon Pi Pledge Class*
Alpha Phi (Sorority)
Alpha Kappa Alpha (Sorority)
Alpha Phi Alpha (Fraternity)
Beta Theta Pi (Fraternity)
Beta Theta Pi Pledge Class
Chi Psi (Fraternity)
Chi Psi Pledges
Delta Delta Delta (Sorority)
Delta Gamma (Sorority)
Delta Sigma Theta (Sorority)
Gamma Phi Beta (Sorority)
Greek Presidents' Council
Interfraternity Council
Kappa Alpha Psi (Fraternity)
Kappa Alpha Theta (Sorority)
Kappa Kappa Gamma (Sorority)
Kappa Sigma (Fraternity)
Kappa Sigma Pledge Class
Lambda Chi Alpha (Fraternity)*
Lambda Theta Delta (Fraternity)
Panhellenic Association at UCI
Phi Delta Theta (Fraternity)
Phi Gamma Delta (Fraternity)
Phi Sigma Kappa (Fraternity)*
Phi Zeta Tau (Sorority)
Pi Beta Phi (Sorority)
Sigma Alpha Epsilon (Fraternity)
Sigma Alpha Epsilon Pledge Class
Sigma Chi (Fraternity)
Sigma Nu (Fraternity)
*Not recognized by Interfraternity Council

International Groups

Educational and Cultural Persian Organization
Indian Sub-Continental Club
International Students Network

Political Groups

Latin American Solidarity Network
The New Americans Club
Society for Individual Liberty
Students for High Frontier
Young Americans for Freedom
Young Republicans at UCI

Recreational Groups

Ski Club
Surf Club
Sailing Association at UCI
Wilbeest Horse-Owners Association (WHOA)
Windsurf Club

Religious Groups

ADAT Hamashiach
Asian American Christian Fellowship
Bahai Club
Brothers and Sisters in Christ
BSU Gospel Choir
Campus Christians
Campus Crusade for Christ
Canterbury Irvine
Chabad Jewish Students
Chinese Christian Fellowship
Christian Assembly in Irvine
Eckanar
Interfaith
Inter-Varsity Christian Fellowship
Jewish Student Union—Hillel
Koinonia
Korean Christian Fellowship at UCI
Latter Day Saints
Lutheran Campus Ministry
Metamorphosis
Muslim Students' Association
Navigators
St. Athanasius Campus Ministry
SEARCH
Shambala Training
Studies in the Old and New Testaments
UPREACH
Vineyard Christian Fellowship
Walk by Faith Ministries
Young Leadership Life

Service Groups

Amnesty International
Challenge for Charity
Circle K
Flying Samaritans International, Student Subchapter
Friends of KUCI
Gay and Lesbian Student Union
Nontraditional Students Association
Oxfam America
Pep Squad
Project Ngoc
Puerto Rican Student/Staff Association
University Ambassadors

Social Groups

Academic and Professional Women's Association
Arab Students' Association
Armenian Students Association

Banzai Adventure Club
Campus Village Community Club
Commuter Club
Film Association
French Club
The Gay and Lesbian Faculty Staff Network
Hui Hawaii O'Ivaina Hawaii Club
The Humanities Council
Nontraditional Transfer Students
Photography Club
The Prom Committee
Returning Students Support Group
Star Trek Association
Student Alumni Council
United Association of Scholars and Students from the Republic of China
World Travel Club

Sports Clubs

Bicycle Racing Club
Hwa Rang Do at UCI
Karate Club at UCI
Men's Lacrosse Club
Rugby Club
Ski Racing Team
Tai Chi and Kung Fu Club

Third World Groups

Asian Faculty and Staff Association
Asian Pacific Student and Staff Association
Ballet Folklorico at UCI
Black Student Union
Cambodian Students' Organization
Chinese Association at UCI
Delta Delta
Hong Kong Club
Iranian Cultural Club
Kababayan
Korean-American Students' Association
MEChA
Messianic Students' Association
Republic of China Student Organization
Tomo No Kai
Vietnamese Students Association at UCI (VSAUCI)

Other

AIDS Student and Staff Panel
Anti-Faith
BACCHUS
Bare Bones Dance Theatre
Comedy Club
The First Party
Friends of the New University P.U.H.D.
Students Against Cruelty to Animals
Sales, Marketing, and Management Club
Shaman Gardens
Society for Creative Anachronism
Vegetarian and Health Club

Student Government**Associated Students**

The Associated Students of the University of California, Irvine (ASUCI) is composed of all registered undergraduate students. Quarterly student fees allow this nonprofit organization to provide leadership, representation, entertainment, and social activities for students.

Services

ASUCI funds, manages, and operates numerous student services on campus. OutRoads-ASUCI Travel Service provides the campus community with travel information, airline tickets, tours, worldwide travel packages, charter flights, student discount flights, cruises, rail passes, passport photos, student travel identification, and travel seminars. The ASUCI Recycling Center, located at North Campus, is the only multimaterial, 24-hour, drop-off center in the Irvine/Newport Beach area. The Center recycles newspaper, ledger paper, aluminum cans, glass, cardboard, motor oil, and batteries. The ASUCI supports the College Legal Clinic which provides free legal assistance and attorney consultations for students.

ASUCI entertainment services offer all students varying diversions for their leisure hours. Major concerts occur at least twice a quarter and popular films are shown for free or at reduced rates. Speakers appear periodically under ASUCI's sponsorship, with topics ranging from politics to economics and humor. The Soundstage program allows students to see popular club acts perform on campus at a reduced admission charge. Oktoberfest is held in the fall, a St. Patrick's festival in the winter, and each spring Wayzgoose, a student festival with a Medieval theme, is held in Aldrich Park. The UCI Pep Band and Pep Squad, funded by ASUCI, support UCI athletic teams with rallies, dances, rooster sections, and other spirit-raising activities. These programs are operated by student commissions, which all students are encouraged to join.

Organization

The ASUCI government consists of a 25-member Council, including 20 representatives from the academic schools and programs and five executive officers, who are elected for one-year terms by the student body each spring. The executive officers help ASUCI achieve its primary goal, to be wholly responsive to student needs and desires. The President deals with Universitywide issues affecting undergraduates, administers the ASUCI budget, and is the primary spokesperson for the Associated Students in policy determinations with campus and systemwide administrations. In addition, the President coordinates student advocacy in both Sacramento and nearby Orange County communities. The Executive Vice President chairs Legislative Council meetings, serves on the Registration Fee Advisory Committee, and supervises the management of all ASUCI elections. The Vice President for Academic Services is the primary student liaison to the campus and Universitywide Academic Senate, directs the Student Recommended Faculty Program (through which students can nominate visiting lecturers), and coordinates publication of the annual Teacher Evaluation Handbook. The Vice President for Administrative Services appoints and monitors more than 60 student representatives to UCI administrative and Academic Senate committees. The Vice President for Student Services investigates new services, evaluates current programs, and coordinates all ASUCI entertainment programming. Each of the executive officers works with several appointed student commissioners to carry out these tasks.

ASUCI policy and final budgetary decisions are made by the Council. Each councilperson sits on at least one subcommittee of the Council. Council elections are held in fall and spring with 10 (or half) of the Council seats filled in each election.

Involvement

ASUCI's primary goal is to further students' involvement in matters pertaining to curricula, funds, administration, and student life. All students concerned about academics, services, representation, or entertainment are encouraged to contact their Council representative or the executive officers at ASUCI; telephone (714) 856-5547.

Associated Graduate Students

All graduate and medical students are members of the Associated Graduate Students (AGS). The purpose of AGS is to promote and provide for the distinct needs and priorities of graduate students. AGS representatives can be reached at (714) 856-6351.

Services

AGS provides graduate students with numerous student-operated services. AGS is the publisher of *AGS Advocate*, a news magazine for graduate students. AGS provides entertainment for graduate students, allocates funds for graduate student projects, contributes to the funding of the College Legal Clinic, and offers a summer loan program.

Organization

AGS is governed by a council of members elected from each academic unit conducting a graduate program, a president, who is elected in a campuswide election held during spring quarter, and four vice presidents selected by the AGS Council: the Vice President-Internal Affairs, Vice President-External Affairs, Vice President-Administrative Affairs, and Vice President-Financial Affairs. The AGS Council is an independent entity within UCI, with the exclusive responsibility for representing all graduate students to the UCI administration, Office of the President, and the community at large.

The AGS Council nominates graduate students for positions on UCI administrative committees, UCI Academic Senate committees, ad hoc committees, and committees established by the University's Office of the President. AGS representatives work with the Student Body Presidents' Council and the UC Student Lobby to implement legislation which is supportive of students and crucial to the social needs of the community at large.

Medical Students Organization

The Medical Students Organization (MSO) is governed by an elected student council composed of two officers from each class and a student body president, vice president, secretary, and treasurer. The MSO Council along with the AGS Council represents the medical student body in all matters relating to the UCI campus, the University's Office of the President, and the community.

Medical students, as members of AGS, have access to all services funded by the Associated Graduate Students. In addition to these services, the MSO Council utilizes a portion of the quarterly AGS fee to provide funding for medical student activities that benefit the medical school community.

Undergraduate Administrative Intern Program

The Undergraduate Administrative Intern Program provides participating students with administrative and leadership

experience designed to develop personal and professional skills as well as to increase their knowledge of complex organizational structures. Fifteen to 20 students are selected each year and assigned to campus administrative units where they develop programs and projects that benefit student life at UCI. Academic credit, through participation in a weekly seminar, and a stipend are earned by the intern. Additional information is available from the Office of Student Support Services; telephone (714) 856-7760.

University Center

The University Center, located next to the Administration Building, is scheduled to reopen in fall 1989 following a major expansion. The Center will house the University Bookstore, a conference center, offices, shops, and a variety of restaurants.

Campus and Student Services

Career Planning and Placement Center

The Career Planning and Placement Center is responsible for assisting UCI students in career planning and decision making through workshops, individual counseling, part-time and summer employment opportunities and internships; for assisting students and alumni seeking career employment opportunities; for teaching job-search skills and interviewing techniques; for providing career job listings and administering a full program of on-campus recruitment; and for providing graduate and professional school information. Vocational interest testing and a computerized guidance system are available on a fee-for-service basis.

The Center's Student Internship Program provides UCI students with a variety of opportunities to obtain career-related work experience. Students are placed in paid or volunteer internships in the business and professional communities of Orange County and Sacramento. The Center also sponsors the UCDC Internship Program, which selects UCI undergraduate and graduate students for internships in Washington, D.C. The program provides students with an opportunity to examine the behind-the-scenes activities that shape and implement the nation's future course.

In cooperation with the Office of Teacher Education, the Center provides educational placement services for those seeking teaching, administrative, and counseling positions in education. Placement files are maintained and kept active free of charge for six months from the date of graduation. The first 30 files mailed out to educational employers are free; a fee of \$3 per file is charged thereafter. A reactivation fee (which applies after the initial six-month period) is \$35 for 12 months of service. A fee of \$3 per file also is charged to forward placement files to potential educational employers.

In addition, the Center offers services and programs to meet specialized needs of specific student populations, including the disabled, women, minority and disadvantaged students, and returning students. Additional information is available from the Career Planning and Placement Center; telephone (714) 856-6881.

Central Campus Calendar

Central Campus Calendar schedules meeting and event space and provides services for many events and activities which take place on campus. The Office provides information and advice to program planners, interprets University policies and procedures, and advises those planning programs on the most economical, efficient way to use campus support services. Selection and reservations of facilities, orders for staff

and equipment support, and cost estimates are processed through the Office. The Calendar Office assigns academic, Extension, and Summer Session classrooms, provides centralized billing for special events, and serves the campus as a central information center by maintaining the master calendar of campus activities. The Office is located in 255 Administration Building; telephone (714) 856-5252.

Child Care Services

Child Care Services is organized into four Centers offering full-time programs and a fifth program, which is part time. The Infant/Toddler Center provides services for children from three months to two and one-half years of age. The Early Childhood Education Center and the Children's Center provide educational programs and care for children ages two and one-half to five; the Extended Day Care Center serves children ages five to 12; and the Verano Preschool provides care for children ages two and one-half to kindergarten. The programs are designed to meet the individual needs of each child. Toward that end, the Centers provide environments in which diverse cultural, ethnic, and personal teaching and parenting styles are encouraged. The programs are open to children of UCI students, faculty, and staff, with priority enrollment and tuition subsidy available to students. Information may be obtained by visiting the Centers or telephoning (714) 725-2100.

University Montessori School of Irvine is the sixth child care center serving UCI students, faculty, and staff. The School serves 180 children ages three months to kindergarten. Enrollment is on a first-come, first-served basis. Additional information is available from the School; telephone (714) 854-6030.

Commencement

UCI Commencement ceremonies are held each June for all students who graduate any quarter of that academic year. Commencement protocol information is mailed to all prospective graduates in late spring and also is available from each academic unit's academic counselor. Additional information is available from the Public Ceremonies Coordinator in the Arts, Lectures, and Student Affairs Communications Office; telephone (714) 856-6379.

Conference Services

Conference Services is a comprehensive service for conferences, workshops, and seminars held either at UCI or near the campus. Information, program and budget planning, dining services, and accommodations are arranged by the Conference Services Office. Recreational activities, including use of University facilities, and tours of the area also can be provided. Conference Services is located in 255 Administration Building; telephone (714) 856-6963.

Counseling Center

The Counseling Center offers a variety of programs through which students can learn cognitive, affective, and behavioral skills which will enable them to function more effectively in an educational environment. Individual, group, couple, and family psychotherapy is available to all students, as well as crisis intervention services when needed. Staff also provide students with a wide range of workshops and academic courses related to learning and interpersonal issues including procrastination, stress reduction, assertiveness, coping with depression, human sexuality, cross-cultural interaction, and intimacy and friendships. Staff psychologists train student group leaders, student interns, resident assistants, peer academic advisors, and administrative personnel on topics including stress management, communication, listening,

leadership, group dynamics, and crisis intervention skills. The Counseling Center is located on the second floor of Student Services I; telephone (714) 856-6457.

Dean of Students

The Office of the Dean of Students oversees programs and services which promote the building of campus community, the appreciation of cultural diversity, the testing and refining of personal values, the development of leadership potential, the understanding of community service, and the opportunity for critical thinking. The Office staff also handle matters of student conduct and administer student discipline. Additional information is available by telephoning (714) 856-5590. The Office is located on the second floor of Student Services I.

Housing

Off-Campus Housing

The Off-Campus Student Services Office provides services to help UCI students locate and obtain off-campus housing. Information provided includes lists of apartments and houses for rent, rooms for rent in private homes, roommates wanted, roommates available, and carpool possibilities.

In addition, the Office publishes *Living Around UCI*, a guide to apartment complexes located near the University which includes rental prices, local realtors, and utility companies. The publication also contains information on budgeting expenses, roommate selection, and tenant/landlord rights and obligations.

Monthly rental prices for apartments, condominiums, and houses in the Irvine area in fall 1988 were \$450-650 for a studio or bachelor, \$575-750 for a one-bedroom, \$700-1,095 for a two-bedroom, and \$950-1,400 for a three- or four-bedroom. A student's individual rent costs will be determined by the number of people sharing the unit.

The Office has a courtesy telephone which may be used to make local phone calls regarding housing. Advisors are available to answer questions and provide additional information related to off-campus living. The Off-Campus Student Services Office is located in 209 Administration Building and is open from 8:00 a.m. to 5:00 p.m. weekdays (until 6:00 p.m. from early August until classes begin). During the summer the Office is open on certain Saturdays from 11:00 a.m. to 3:00 p.m. Specific dates and additional information are available from the Office; telephone (714) 856-7247.

Housing Options Made Easier (HOME) is a program sponsored by Off-Campus Student Services. This three-day residential program provides information on locating housing, selecting a roommate, commuter-student survival tips, and more. Student staff is available to provide first-hand information on all aspects of living off campus. The HOME program's fee covers housing, meals, workshops, tours, and information packets. Enrollment is limited to approximately 170 participants on a first-come, first-served basis.

The Off-Campus Student Services Office provides additional programs for commuter students; see page 75.

Students who live off campus may wish to take advantage of a Nonresident Meal contract. This contract, good for any quarter, enables a student to eat 19 meals per week in the Mesa Court Dining Commons. For spring quarter 1989, the price of the contract was \$7.25 per day. Additional information is available from the Housing Cashier, Housing Administrative Services; telephone (714) 856-6811.

Also available for students who do not live in the residence halls are Meal Punch Cards. Each card, which costs \$45, holds 20 punches, and may be purchased from the Board Dining Director in Mesa Court, telephone (714) 856-6251. Breakfast (one punch), lunch (two punches), dinner (three punches), and Steak Night dinner (four punches) are available in the Mesa Court Commons. All meals except lunch also are available in the Commons in Middle Earth.

On-Campus Housing

The On-Campus Housing Office coordinates application procedures and contracts with campus residents. Approximately one-fourth of UCI's student body can be housed on campus.

UCI's residence hall program emphasizes small-group living. On-campus residences currently house 1,550 single undergraduate students in Mesa Court and Middle Earth, and construction is underway to add accommodations for 780 more. Each hall houses from 40 to 60 students and a student resident assistant or resident staff member. The small-scale buildings provide excellent opportunities for social interaction, student government, and leadership experience. Each hall tends to have distinctive characteristics and often focuses on a specific interest or life-style. Examples include halls devoted to the fine arts, the humanities, languages, the outdoors, or crafts. The residences are divided into suites of four or five double rooms, with living room and bath; each residence also contains a lounge and recreation and study rooms. A limited number of single rooms also is available in each residence hall. Every room has carpeting and draperies, and is furnished with a bed, desk, chair, chest of drawers, closet, and bookshelves for each student.

Both Mesa Court and Middle Earth have complete food service and dining commons for their residents. Students who live in the residence halls participate in a prepaid meal plan. Meals are served cafeteria-style, and the menu offers a wide selection of food, with fresh fruit and an array of salads daily. Meals are served three times daily on weekdays (brunch and dinner only on Saturday and Sunday) in the Mesa Court and Middle Earth Commons. The halls are closed during the Christmas and spring recesses, and although they remain open over the Thanksgiving holiday, no meals are served.

The Student Programs Offices at Mesa Court and Middle Earth have responsibility for providing student residents with an environment conducive to their intellectual, social, and personal growth. The housing staffs work closely with students to create opportunities for educational exploration and ways of developing interpersonal skills. The residence halls have distinctive personalities. In many cases, an academic interest characterizes a hall style. The Outdoor and Photography Halls are examples of special interest hall programs. Weekend field trips and retreats, designed to amplify on-campus experiences, are often part of the interest hall programs. The Student Programs Offices also supervise and train resident assistants and resident staff, advise the residential student government, and coordinate information and skill development workshops.

An unusual housing option at UCI is the 80-space recreational vehicle park, Irvine Meadows West, which provides housing for graduate and undergraduate students. The rate for 1989-90 is \$100 per month per space. Students must provide their own recreational vehicle or trailer which must contain a sink, hardware for running water, and a stove. An application for Irvine Meadows West may be obtained from Housing Administrative Services; there is a \$15 nonrefundable application fee. Currently, there is a waiting list.

An apartment complex for single undergraduates, Campus Village, offers 200 two-bedroom apartments housing 800 students. Most of the units are furnished; all include carpeting, draperies, a stove, and a refrigerator. Various programs are offered in the Village's Community Center, lounges, and recreation buildings. Costs, which include utilities, are \$2,337 per student for an unfurnished apartment and \$2,617 per student for a furnished apartment for the 1989-90 academic year (September-June). An increase in rates for 1990-91 is anticipated.

The University also has 862 one-, two-, and three-bedroom apartments in Verano Place for full-time registered students who are married, single parents, graduate students, or who are single and 25 years of age or older. The majority of the apartments are unfurnished, and all have carpeting, draperies, a stove, and a refrigerator. They are attractive and considerably lower in rent than comparable units in local communities. An assortment of social, cultural, and educational programs such as community dinners, courses, and workshops is offered in the community. Students may apply to live in Verano Place at any time by requesting an application from Housing Administrative Services. A nonrefundable application fee of \$15 must accompany the application. Application should be made well in advance of the date the student wishes to move in.

Accommodations for an additional 60 graduate students are currently under construction at Middle Earth.

Undergraduate applicants wanting to live in the undergraduate residence halls or apartments must indicate their interest in on-campus housing by marking the appropriate item on the UC Undergraduate Application for Admission in order to receive an application for housing. Due to the large demand for housing, newly admitted students wishing to live on campus will participate in a lottery for housing space. To be eligible for the lottery, prospective students must return their housing application by March 1, accompanied by a \$15 nonrefundable application fee. (Housing applications received after March 1 will not be placed in the lottery.) The lottery will be held on March 13. Names of applicants will be drawn in random order. Letters will be sent to applicants regarding their lottery status by late March. To maintain lottery status, the student must have been accepted for admission to UCI and their Statement of Intention to Register (SIR) must have been received by the Admissions Office on or before May 1. Only those prospective students who have returned both their housing application and their SIR will be eligible to receive a housing contract. Applicants for housing who are admitted to UCI but who do not return their SIR by May 1 will lose their lottery status, and their names will be removed from the housing list. Those students who do not receive notification of their admission status prior to May 1 will retain their lottery position but must return their SIR by the date indicated on it. In addition, priority is given to those students who live outside a specified radius from campus who apply for the undergraduate residence halls or undergraduate apartments between November 1 and March 1. Continuing undergraduates must participate in a lottery for space in the residence halls or undergraduate apartments for the following academic year.

Students who become eligible for residence hall contracts will be obliged to pay \$250 as a reservation fee at the time the contract is returned to the University; any cancellation, regardless of the circumstances or time of year, will result in a liquidation damages fee. Charges for the 1989-90 academic year are \$4,993-5,227 for a single room and \$4,519-4,756 for a double room; rates include a \$21 annual association fee. An

increase in cost is anticipated for the 1990-91 academic year. The cost of room and board in the residence halls is paid in quarterly payments.

Media Services

The Media Services Department provides recharge services for television, media productions, and audiovisual aids to all UCI departments, ASUCI, AGS, recognized campus organizations, and special programs. These services include equipment rental, film ordering, equipment repair, lecture hall media support, and multimedia and television production.

Media Services' main office is located in A-100-G Science Lecture Hall. Hours are 8 a.m. to 6 p.m., Monday through Friday. For general information, equipment rental, or lecture hall services, telephone (714) 856-5128. For film ordering or repair, telephone (714) 856-6233. For equipment repair or production services, telephone (714) 856-4210.

Student Health Service

All fully registered students and students approved for participation in the part-time study program are eligible for Student Health Service benefits. Student health facilities are housed in the Student Health Center, located at the corner of Berkeley Road and Pereira Drive. Facilities include a complete outpatient clinic, staffed by physicians and nurses, and supported by an X-ray and clinical laboratory. General medical clinics are held 8 a.m. to 5 p.m. every day during the week. Urgent, after-hours care is available until 8 p.m. on week-nights, and from 10 a.m. until 1 p.m. on Saturdays. Specialty clinics are held at variously scheduled times by appointment and include Dermatology, Gynecology, Orthopedics, Mental Health, Women's Health, Minor Surgery, and Ear, Nose, and Throat. Emergency service is provided 24 hours per day when classes are in session. An infirmary provides inpatient care for students who need bed care. The main telephone number for the Student Health Center is (714) 856-5301.

A risk-pool insurance program also is available which provides limited coverage for emergency care and hospitalization when such care is required but not available at the Student Health Center. To be qualified to receive the benefits of this insurance, each fully registered student must have complied with the medical history and physical examination requirement of UCI. *Students are not eligible for insurance benefits until these records are on file in the medical records department of the Student Health Center.* Medical history and physical examination forms are mailed to new undergraduate and graduate students and to readmitted students as their names become available to the Student Health Service. Medical students receive the packets from Medical Student Admissions. International students' packets are mailed by the Office of International Services with their initial registration packet. Students should check with the Student Health Service for information on the benefits and limitations under the insurance plan.

Student health coverage extends from the first day of the quarter to, but not including, the first day of the following quarter, but begins only after the student has paid the full Registration Fee and has been issued the Class Verification and Identification Card. There is an exception for spring quarter coverage which extends only to the last day of that quarter.

An optional insurance plan covering major medical occurrences for students, spouses, and children and coverage for the summer or one unregistered quarter each year is available. Enrollment in this plan is limited to a short time at the beginning of each quarter. To ensure coverage, students

should visit the Student Health Center during the first week of each quarter for information and application forms.

All international students are required to carry adequate health insurance. Those students who have private insurance which is equal or superior to the policy provided through the University may be eligible to have the International Student Health Insurance Fee waived. As of spring 1989 the fee was \$99 per quarter. Additional information is available from the Student Health Service Insurance Coordinator; telephone (714) 856-7093.

Physical Examinations and Health Clearances. All new students and students returning to UCI after an absence of two or more quarters are required to have a complete physical examination within 90 days prior to the first day of the quarter. The examination should be performed by the student's own physician. If this is impractical, the examination can be obtained at the Student Health Center for a fee. For an appointment telephone (714) 856-5304. Students transferring from another University of California campus where their medical records are on file should have the records transferred to the UCI Student Health Center. Failure to comply with the physical examination requirement results in loss of insurance eligibility, and a fee for services provided by the Student Health Service.

Student Health coverage provides as many services as possible without additional charge; however, some services are available only on a fee-for-service basis. Some of the services available for a charge are immunizations; allergy desensitization injections; prescriptions from the Student Health Pharmacy; dental services including minor surgery; elective laboratory tests; and, time permitting, physical examinations for employment, insurance, or a marriage license. Professional counseling and help for emotional problems are available through the Mental Health Division of the Student Health Service. Psychiatric and psychological services, as well as headache and biofeedback relaxation training, are available. Eye care is available on a fee-for-service basis to students and their spouses at the Eye Clinic located in the Student Health Center. Appointments with the optometrist can be made by telephoning (714) 856-5304.

The Student Health Service encourages preventive medicine. It supplements but does not supplant the family physician. Full and mutual cooperation between the Student Health Service and the family physician is encouraged.

Health education courses are offered for academic credit through the UCI Office of Teacher Education. Health Science Experience, training in Peer Health Advising, and field work opportunities are available. Health education programs offered through Student Health include CPR, First Aid, Blood Drive, UCI Student Health Center Work Experience, Plaque Control, and Student Health Advisory Committee. For information regarding these courses and programs contact the Student Health Center; telephone (714) 856-5806.

Student Support Services

The Office of Student Support Services emphasizes orientation, outreach, service, and leadership development programs. Orientation programs include the Student-Parent Orientation Program (SPOP), a weekend live-in experience on campus for new students and their parents; Uni-Prep, a week-long, intensive program in September to help new students develop increased social and intellectual skills; a spring information program for UCI applicants; and Academic Advising and Orientation Week ("O Week"), held in the fall.

The Student Support Services Office coordinates the programs for disabled and international students, students who

reside off campus, gay and lesbian students, veterans and nontraditional students, and undergraduate administrative interns, and for the Women's Resource Center. In addition, the Office provides services and programs for new students through New Student Programs, the Peer Mentor Program, and the Freshman/Transfer Challenge. The Office and its various programs provide hundreds of student leadership and student employment opportunities. The Office is located in 201 and 209 Administration Building; telephone (714) 856-7244.

The **Office of Disabled Student Services** offers disabled students opportunities to ensure their effective participation in the academic community at UCI. Students with varying disabilities including those who use wheelchairs, semi-ambulatory, blind or visually impaired, deaf or hearing-impaired, learning-disabled, or who have chronic health problems are eligible to receive support services through this program. Staff assist students from the point of their admission to UCI through graduation. Specialized services include reader services, test-taking assistance, priority registration, provision of notetakers and interpreters, liaison with faculty and campus departments, and on-campus transportation. In addition, a van is available (by reservation, certain restrictions apply) for off-campus transportation for medically and academically related purposes. All buildings on the Irvine campus are accessible to wheelchairs.

Disabled students who require accommodations for the classroom (such as the service of an interpreter or notetaker) are strongly urged to contact the Disabled Student Services Office as soon as possible after admission in order to acquaint themselves with the policies and services of the campus. The Office is located next to the Humanities Trailer Complex; telephone (714) 856-7494 (voice), 856-6272 (TDD).

The Office of **International Services** provides services to international students, permanent residents, refugees, and international faculty members and scholars and their families. Services include assistance with visa and immigration forms and the interpretation of government regulations. In addition, the staff provides information about all the necessary services for effective participation in the University community including housing, tutoring, orientation, registration, financial aid, and student activities. The staff refers students to other campus support services as necessary. The Office is located in 201 Administration Building; telephone (714) 856-7249.

The **Nontraditional Students Program** offers services to students returning to school after an interruption in their education. The staff assists with programming, counseling, orientation, and other student activities. This Office is located in 201 Administration Building; telephone (714) 856-7249.

The **Veterans Program** emphasizes support services for veteran students and eligible dependents of veterans. Assistance includes benefit certification, tutorial services, work-study, orientation, and outreach programs. Veterans and eligible dependents are reminded that in order to receive VA educational benefits they must adhere to the standards of satisfactory progress and attendance which are described in the *UCI General Catalogue* on pages 47-49 and 63-65. Veterans and eligible dependents should check with the Office for additional information regarding educational requirements. The Office is located in 209 Administration Building; telephone (714) 856-6477.

New Student Programs staff provides assistance and information to students who are in the process of being admitted to UCI. It also coordinates parent and mentor programs. The

Peer Mentor Program provides a forum for new students to interact with continuing UCI students, who serve as mentors. Information about the Peer Mentor Program is available; telephone (714) 856-7760. The **UCI Parents' Program** provides a link to the campus for parents of current UCI students. A quarterly newsletter is mailed to participants, and periodic conferences are held to enable parents to share ideas and become informed about UCI. Additional information is available from the Program Office; telephone (714) 856-7759. In addition, New Student Programs operates the **Information Center** located in the Administration Building lobby; telephone (714) 856-6345. Professional staff and student volunteers are available to provide a variety of information about UCI and to assist campus visitors and new students.

Off-Campus Student Services provides a variety of services for prospective students as well as for enrolled UCI students who live off campus. Among the programs are assistance in locating housing, roommates, and carpools; advice and personal tips on living off campus, and a Commuter Club.

The Office also coordinates **The Freshman/Transfer Challenge**, a fall-quarter orientation class for new students who commute to campus. Further information also is available from 209 Administration Building or by telephoning (714) 856-7247.

The **Women's Resource Center (WRC)** is located on the first floor of Gateway Commons. The WRC offers a supportive environment for all women through programs and services that adapt to the changing needs of the UCI community. Services include workshops, support groups, peer and professional counseling, rape prevention, a library, topic files, and a referral service. Additional information is available from the Center; telephone (714) 856-6000.

University Bookstore

The University Bookstore, located across Campus Drive from campus on the ground floor of University Tower, is scheduled to move in the University Center in fall 1989. The Bookstore stocks all required and recommended coursebooks for classes taught at UCI. It also carries an extensive selection of general, technical, and medical books, periodicals, school supplies, assorted sundries, gifts, and UCI sportswear.

Regular bookstore hours are Monday, 8 a.m. to 7 p.m.; Tuesday through Thursday, 8 a.m. to 6 p.m.; Friday, 8 a.m. to 5 p.m.; Saturday, 10 a.m. to 4 p.m.; closed Sunday. During the first week of instruction each quarter, hours are extended as follows: Monday 7:45 a.m. to 9 p.m.; Tuesday through Thursday, 7:45 a.m. to 8 p.m.; Friday, 7:45 a.m. to 5 p.m.; Saturday, 10 a.m. to 4 p.m.; closed Sunday. Bookstore phone numbers are (714) 856-7411 for book information and (714) 856-7336 for general information.

The **Medical Bookstore**, located at the College of Medicine adjacent to the Beckman Laser Facility, stocks medical coursebooks, medical exam review books, medical instruments, and supplies. Hours of operation are Monday through Friday, 8 a.m. to 6 p.m.

Computrends is a retail computer store which stocks microcomputers, personal computers, calculators, books and periodicals on computing, and computer software. It also stocks a wide selection of peripheral computing equipment including printers, plotters, modems, and computing supplies. Hours of operation are Monday through Friday, 9 a.m. to 6 p.m. Computrends, located in Gateway Commons on the second level behind Gateway Gardens, is scheduled to move into the University Center in fall 1989. Additional information is available from Computrends; telephone (714) 856-4266.

Paul S. Sypherd Vice Chancellor for Research and Dean of Graduate Studies

Research and graduate education, two major areas of responsibility of the Office of Research and Graduate Studies, are vital and integral parts of academic life at UCI. Programs leading to doctoral or master's degrees are offered in more than 85 academic and professional areas. Many of UCI's graduate programs and research activities have achieved national reputations for excellence, and several are internationally recognized as leaders in their respective fields. UCI graduate programs continue to grow and to evolve in directions that are consistent with the University's teaching, research, and public service missions. Graduate study at UCI provides the excitement and satisfaction that spring from the discovery and dissemination of new knowledge, as well as from meeting new challenges.

The Vice Chancellor for Research and Dean of Graduate Studies has general administrative responsibility for research and graduate education. In the area of research, the Vice Chancellor has responsibility for the administration of extramurally funded training grants, general research administration, and research policy development and implementation. Graduate education responsibilities include admissions, enrolled-student actions and advising, degree awards, fellowship and assistantship administration, Teaching Assistant training, and the Graduate and Professional Opportunity Program, which facilitates the involvement of minority students and women in graduate education.

The Office of Research and Graduate Studies also is administratively responsible for Organized Research Units, Irvine Research Units, Focused Research Programs, contract and grant administration, and other campus research activities. The following sections describe areas of research and graduate education, and include information about academic regulations and policies important to applicants and graduate students.

Research

The University of California is the State's primary research institution. Most scholarly research and creative activities are supported by University funds or by grants and contracts from federal and state agencies, foundations, corporations, and individual sponsors. Faculty at UCI participate in activities in many traditional fields of endeavor as well as in "new" interdisciplinary pursuits. For example, in the humanities, UCI has become a world center for the study of critical theory. In physics, UCI scientists are involved in ongoing studies on the nature of subatomic particles. Members of the Chemistry faculty are leaders in the study of atmospheric phenomena such as ozone depletion. Faculty research in biomedical sciences covers a wide range of areas including neuroscience, molecular biology, genetics, and cancer-related studies.

The Vice Chancellor for Research has responsibility for research administration, including research policy, research development, organized research activities, UCI-industry relations involving research, animal research administration, and research committee support. In addition, the Vice Chancellor is responsible for contract and grant administration which includes the submission of proposals, acceptance of grant and contract awards, and negotiation of all awards for extramurally funded research, training, fellowship, and public service programs. The Office of Research and Graduate Studies also maintains a Resource Center containing the most current information about extramural funding sources for student and faculty research.

While most research takes place at the academic unit level, the academic quality of many of UCI's educational programs is enhanced by Organized Research Units, Irvine Research Units, and Focused Research Programs that extend beyond unit boundaries.

University of California Humanities Research Institute

The University of California Humanities Research Institute was established on the Irvine campus in September 1987 to provide a Universitywide locus for collaborative and individual research in the humanities among University of California scholars and their national and international colleagues.

The Institute sponsors conferences, seminars, and workshops addressing themes at the forefront of current dialogue in the humanities, providing forums for the emergence and enhancement of new research interests and scholarly collaboration. In addition, the Institute produces a series of publications, including conference proceedings, monographs, and books developed through these various forums.

Research themes are developed from four major areas of humanistic concern: (1) Area studies—western, eastern, Third World, dominant, and minority cultures, examined individually or comparatively; (2) Historical studies—the retrieval of texts and contexts in the major literary periods, examined individually or comparatively; (3) Discourse studies—the languages of the arts, the humanities, and the sciences; and (4) Humanities beyond its boundaries—humanistic concerns in medicine, law, business, science, technology, public policy, and public institutions.

Organized Research Units

Organized Research Units (ORUs) normally consist of an interdepartmental group of faculty, students, and other researchers engaged in a continuing program of research, supported by both University and extramural funding. The work of some ORUs is directed toward the solution of complex contemporary problems, while others conduct basic research essential to the understanding of natural or social phenomena or of humanistic ideas and expressions. Organized Research Units established on the Irvine campus by The Regents of the University are the Cancer Research Institute, the Center for the Neurobiology of Learning and Memory, the Critical Theory Institute, the Developmental Biology Center, the Institute of Transportation Studies (ITS), the Institute for Surface and Interface Science (ISIS), and the Public Policy Research Organization (PPRO).

Cancer Research Institute

The Cancer Research Institute provides leadership and support for researchers working toward understanding and controlling cancer. The Institute serves as a means of focusing, coordinating, and directing efforts of scholars in basic and clinical sciences from several departments of the School of Biological Sciences and the College of Medicine. It provides a central source of information concerning cancer-related research, as well as a forum in which basic researchers and clinicians can assess advances that may be of immediate value in the diagnosis and treatment of cancer, and in the detection of chemicals or conditions that cause cancer. Ongoing and projected research activities involve the regulation of cell function, viral carcinogenesis, immunology, and basic molecular processes relevant to cancer.

Center for the Neurobiology of Learning and Memory

The Center for the Neurobiology of Learning and Memory fosters multidisciplinary research concerning the neurobiological processes underlying learning and memory. Research efforts are stimulated and coordinated through research seminars, colloquia, quarterly meetings, and international conferences, as well as collaborative research projects involving faculty members of the Center, visiting fellows, postdoctoral fellows, graduate students, and undergraduate students. Research programs include investigations at several levels of analysis, including cell chemistry, cell physiology, brain systems, cognitive processes, neural modeling, and artificial intelligence. Members include faculty from the Department of Psychobiology in the School of Biological Sciences, the Department of Pharmacology in the College of Medicine, the Department of Information and Computer Science, the Department of Physics in the School of Physical Sciences, and the School of Social Sciences, as well as three faculty members from other UC campuses.

Critical Theory Institute

The Critical Theory Institute provides a locus for the conduct and support of collaborative, interdisciplinary research focused on the theoretical underpinnings of such fields as history, literature, philosophy, art, and politics. The Institute's principal function is to provide a forum for debate among competing movements in contemporary critical theory so that existing theoretical models can be challenged and refined. The Institute's research consists not only of the application of theory to data but also of self-reflexive investigation of theoretical presuppositions in order to produce alternative theoretical constructs and strategies.

A recently completed research project of the Institute concerns the increasingly complex nature of the problem of representation in contemporary theories of literature, art, history, and the social sciences. A current project focuses on recent transformations in the concepts and use of language and discourse in the various fields and disciplines of the human sciences (humanities and social sciences). It studies the impact of the displacement of traditional, "natural" models for language by institutional or communicational models.

The Institute organizes colloquia, lectures, seminars, and workshops in which leading theorists from the United States and abroad participate in its research projects. It also sponsors the annual Wellek Library Lectures in which a leading theorist gives a series of lectures on a topic of importance in critical theory.

Developmental Biology Center

The Developmental Biology Center provides focus and support in several related areas of developmental biology and genetics. The major goal of the Center is to understand the mechanisms responsible for the control of growth and the generation of spatial patterns of differentiation during development. Experimental techniques and concepts from the fields of cell biology, embryology, genetics, neurobiology, molecular biology, immunology, and endocrinology are applied to developing insects, hydra, fish, amphibians, birds, and mammals. Undergraduate and graduate students and postdoctoral fellows all participate actively with faculty from the School of Biological Sciences and the College of Medicine in these research programs. The Center also sponsors and organizes a variety of local, national, and international conferences and hosts visiting scientists for collaborative research work. The work carried out in the Center has

potential implications in such areas as the control of growth, the regeneration of lost body parts, and the cause and prevention of cancer, nervous system anomalies, and birth defects in humans.

Institute for Surface and Interface Science

The Institute for Surface and Interface Science provides an interdisciplinary environment for the study of phenomena which occur at the boundaries between phases of matter. The properties of surfaces and interfaces control a wide variety of technologically important problems, including corrosion and lubrication phenomena, the behavior of semiconductor devices, the fabrication of integrated circuits, and catalysts used in automobile exhaust systems. Research into the properties of surfaces and interfaces is conducted by faculty from the Departments of Chemistry and Physics in the School of Physical Sciences and from the Department of Electrical Engineering in the School of Engineering. The Institute supports a number of programs to enhance the environment for collaborative research, including a Distinguished Lecturer Program which brings senior scholars from around the world to UCI, visiting fellows programs, postdoctoral fellowships, seminars, and conferences.

Institute of Transportation Studies

The Institute of Transportation Studies (ITS) is a multi-campus research unit of the University of California (UC), with branches on the Berkeley and Irvine campuses. Faculty affiliates from other UC campuses also participate in Institute-sponsored research. ITS offers an interdisciplinary environment in which faculty and specialists throughout the University join forces to address contemporary transportation problems.

The Irvine branch was established in 1974. Emphasis at Irvine has been on the development of a strong interdisciplinary research capability. ITS research involves faculty and students from the Department of Civil Engineering in the School of Engineering, the Graduate School of Management, the Program in Social Ecology, the Program in Comparative Culture in the School of Social Sciences, and the Department of Information and Computer Science. The Institute also hosts visiting scholars from the U.S. and abroad to facilitate broader academic and professional community.

Research at ITS focuses on planning and analysis of transportation systems, transportation safety, transportation engineering and operations, expert systems, transportation economics, fiscal and administrative issues in public transit, and energy and environmental issues. Recent projects have dealt with the monitoring and control of urban freeway traffic, truck accidents on urban freeways, safety impacts of high-occupancy vehicle lanes, statistical analysis of transit performance, transit service contracting, computer simulation of household travel and activity patterns, land use/transportation interactions, analysis of commuting behavior, alternative fuels, and application of expert systems and image processing to pavement rehabilitation.

The transportation research program at Irvine is supported by the Transportation Systems Center and the ITS Information Center. The Transportation Systems Center offers a variety of computer services in support of research and training. The ITS Information Center contains books, journals, technical reports, and dissertations in the field of transportation, and offers a variety of manual and computer-based information retrieval services.

In conjunction with University Extension, ITS-Irvine sponsors short courses and certificate programs for the nation's transportation professionals. Specialty conferences, such as the First National Conference on Commuter Lanes and Transitways, attract an international audience.

The Institute works closely with UCI's academic units to enhance graduate education in the areas of transportation planning, engineering, management, and policy. Courses of study have been identified for students interested in transportation studies, leading to graduate degrees in the School of Engineering, the School of Social Sciences, and the Graduate School of Management. The Institute extends its support to a large number of graduate students from these various disciplines, enabling students to enrich their studies by participating in ongoing research.

Public Policy Research Organization

The Public Policy Research Organization (PPRO) fosters basic social science research for theory development and testing and serves as a source of information for those involved with policy development. In pursuing its broad policies studies mission, PPRO has focused its efforts on four programmatic research areas: organizational impacts of technology; community and environmental issues; organizational management; and issues of interest to Orange County including an annual survey of Orange County residents.

PPRO draws its research expertise from the full faculty and student resources of UCI. The Graduate School of Management, the Program in Social Ecology, the Department of Information and Computer Science, the College of Medicine, and the Schools of Social Sciences and Humanities are represented in the 135 faculty and students currently conducting research in PPRO. Their areas of expertise include law, public administration, economics, information and computer science, public finance, political science, sociology, psychology, planning, and public health.

Like the research staff, PPRO research projects reflect a multidisciplinary nature. Current studies include the future and use of information systems in local governments; the use of mathematical evidence in court; levels of indoor air pollution in private residences; the effects of seat-belt restraint on the incidence of injuries to children in automobiles; the effects of parents' commitments to work and child-rearing on family life; the respiratory effects of acid fog; and the use and impact of white-collar worker utilization of office automation.

All PPRO projects are based in the social sciences, and many have requirements for original data collection. In support of the data collection activities, PPRO has recently developed the Center for Survey Research which includes state-of-the-art Computer Assisted Telephone Interviewing (CATI) capability. In addition, PPRO provides professional support in data management and data analysis.

A limited number of graduate assistantships and work-study positions are available to qualified UCI students who wish to participate in PPRO research projects, including data collection in the Center for Survey Research, or the preparation of research proposals.

Irvine Research Units

Irvine Research Units (IRU) are established on the Irvine campus for the purpose of providing an organizational structure for the conduct of research that is difficult or infeasible to be carried out within the normal school or departmental structure. Irvine Research Units normally are established for a period of five years, and may provide the basis for estab-

lishment of extramurally supported research centers or Organized Research Units. Currently established Irvine Research Units are in Mathematical Behavioral Sciences and in Combustion and Propulsion Science and Technology.

Mathematical Behavioral Sciences

The goals of the Mathematical Behavioral Sciences research unit are to foster research in the application of mathematical methods to model and to better understand human behavior, both individual and social. The unit sponsors specialized seminars and colloquia, a visiting scholars program, summer workshops, and focused research subteams of faculty, students, and visitors. Participants include faculty from the Departments of Cognitive Science, Economics, Politics and Society, Anthropology, and Sociology in the School of Social Sciences; the School's Mathematical Social Science group; the Department of Mathematics in the School of Physical Sciences; the Department of Philosophy in the School of Humanities; and the Graduate School of Management.

Institute for Combustion and Propulsion Science and Technology

Participants in the Institute for Combustion and Propulsion Science and Technology include faculty, students, and staff in the Department of Mechanical Engineering, School of Engineering; the Department of Chemistry, School of Physical Sciences; and the Department of Community and Environmental Medicine, College of Medicine. The goals of the Institute are to (1) develop a more complete understanding of the physiochemical processes of combustion and propulsion with particular emphasis on turbulent transport, liquid sprays, two-phase particle flows, high-speed and supersonic mixing, laser diagnostics, chemistry-turbulence interaction, and advanced computational methods; (2) establish relationships between these processes and potential health and environmental impacts associated with soot particulate and gaseous pollutant emissions; and (3) apply this understanding to applications of technological importance.

The Institute promotes interaction, provides a broader portfolio of research experiences and opportunities to graduate and undergraduate students, sponsors a seminar series and workshops, and supports a visitors program to enhance interaction with distinguished scientists from both industry and academia.

Focused Research Programs

Focused Research Programs are established for the purpose of developing and, for a limited period of time, sustaining interdisciplinary research that could not be carried out through individual effort or within a single academic unit. Because of the developmental nature of these programs, they ordinarily are approved for no more than three years and are supported partly by University funds. If a research program develops successfully, it may continue with extramural and/or University support. Five groups of faculty, students, and other researchers currently are recognized as Focused Research Programs.

Computational Chemistry

Faculty in the Department of Chemistry in the School of Physical Sciences have established a program to further the development of computational technologies and to encourage and explore the use of these technologies for the chemical sciences. Using recent advances in digital computer technology, the participants are attempting to establish at Irvine a model for the manner in which chemical studies will be conducted in the future.

Molecular Biology of Eucaryotic Viruses

Faculty participants in this program are from the Department of Molecular Biology and Biochemistry in the School of Biological Sciences and the Departments of Microbiology and Molecular Genetics and of Pathology in the College of Medicine. The goal of the program is to provide a core facility for the collaborative interaction among faculty researchers working in several related areas of virology. A major activity is the development of communication between virologists in the UCI community and their colleagues at other institutions.

Neurobiology of Alcohol and Substance Use/Misuse

This program involves faculty researchers from the Departments of Biological Chemistry, Neurology, Surgery, Radiology, and Psychiatry and Human Behavior in the College of Medicine and from the Department of Molecular Biology and Biochemistry in the School of Biological Sciences. They are engaged in research, education, and community interaction related to several drug and alcohol studies, beginning with the neurobiological effects of PCP usage.

Southern History

Faculty from the Department of History in the School of Humanities and faculty from the School of Social Sciences are working in collaboration with faculty from the Department of History at the University's San Diego campus. The objective of the FRP is to provide a forum for defining and investigating the sources, uses, and consequences of power and authority in the southern United States from the seventeenth through the twentieth century. Individual research projects consider various facets of the larger problem of power and authority. The program sponsors colloquia during the academic year and hosts a research seminar during the summer.

Work Environments

Faculty researchers from the Program in Social Ecology, the Graduate School of Management, the Department of Information and Computer Science, the School of Social Sciences, and the University's Southern Occupational Health Center are collaborating on studies on the physical and social features of work environments and their impact on employee health, productivity, and morale.

Graduate Education

With the exception of programs conducted by the College of Medicine for the training of medical professionals, the Dean of Graduate Studies administers graduate education in accordance with academic policies established by the Academic Senate and by the Graduate Council, a standing committee of the Irvine Division of the Academic Senate. There is no separate graduate faculty at UCI; graduate work is supervised by academic units and faculties which have concurrent responsibility for undergraduate studies.

A great deal of information about graduate education at UCI is published in the *UCI General Catalogue* and individual graduate program publications. The staff of the Office of Research and Graduate Studies is ready to help answer questions about admission, academic policies and procedures, graduate programs and degrees, financial assistance, student services, and other matters of concern to applicants or graduate students. The Office is located in 145 Administration Building; telephone (714) 856-6761.

Through the Graduate and Professional Opportunity Program (GPOP), positive steps are being taken to increase the

participation of minorities, and women in certain fields, in the graduate academic and professional programs of the University. Appropriate assistance is offered during the admission process, and every effort is made through GPOP advising and support to ensure that all students will have a reasonable chance to attain their academic objectives. UCI does not discriminate against any applicant on the basis of race, religion, color, national origin, sex, age, handicap, sexual orientation, or marital status.

Admission to Graduate Standing

Applicants for admission to graduate study at UCI must apply for acceptance into a specific graduate program to work toward an advanced degree. A general requirement for admission is that the applicant hold the degree of Bachelor of Arts, Letters, Philosophy, or Science (or an acceptable equivalent) from a recognized academic institution. A grade point average of at least B (3.0 on a 4.0 scale) is required.

Each applicant's file is evaluated by the admissions committee of the specific graduate program and by the Dean of Graduate Studies on the basis of such factors as academic subject preparation, scholarship, letters of recommendation, test scores, and examples of previous work. A critical question is whether the applicant's academic objectives can reasonably be satisfied by the graduate programs on this campus. The University of California does not have the capacity to accommodate all applicants who meet the minimum admission requirements.

Prospective graduate students are encouraged to assess the professional placement opportunities that are anticipated in the field of interest. It is generally recognized that the number of traditional academic appointments in certain disciplines is limited. There are, however, other attractive career options, many of them as yet unrecognized, for highly motivated men and women who demonstrate intellectual strength, integrity, and discipline in earning an advanced degree from a respected university. UCI is committed to helping graduate students develop, in addition to their academic training, the communication and problem-solving skills that also may be critical to future careers.

Application Procedures

How to Apply

Applicants must complete the Application for Admission which may be obtained by contacting individual graduate programs or the Office of Research and Graduate Studies. The application must be submitted on the forms supplied by UCI and accompanied by a check, draft, or money order payable to Regents-UC in the exact amount of the \$35 Application Fee. This fee is not refundable. Detailed instructions on how to complete the application are contained in the application packet.

When to Apply

For all graduate programs, applications should be completed by January 1 to receive full consideration for fellowship and assistantship awards. Some academic units will accept applications for winter or spring quarter admission for which deadlines are October 15 and January 15 respectively. In order to process applications in time for the applicant to receive full consideration, letters of recommendation, official transcripts, and test scores must be received before the published deadlines. Applications for admission received after the published deadline for the quarter requested will be deferred automatically to the next open quarter.

Required Supporting Documents

Letters of Recommendation

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective major department or program. Recommendation forms are enclosed in the application packet. Only one set of recommendation letters needs to be submitted in support of an application for admission and fellowship or assistantship consideration. It is important that letters of recommendation be completed by professors or instructors in disciplines related to the proposed course of study who are in a position to analyze an applicant's abilities and academic promise.

Graduate Record Examination (GRE) Scores

All applicants are required to take the Graduate Record Examination (GRE) General Test, with the following exceptions: (1) the Graduate School of Management prefers that applicants take the Graduate Management Admission Test (GMAT), and (2) no tests are required of those who seek the Master of Fine Arts degree, the Master of Arts in Teaching, or California education credentials. There is no minimum GRE score. Several programs also require, or strongly recommend, that an applicant report the score of a GRE Subject Test. Applicants should register for either the October or December test dates to ensure the timely receipt of their score results for admission consideration. The GRE is administered five times a year in the United States and in 96 other countries. In addition, several administrative service tests are given each year in major U.S. cities (dates vary). Applications for the GRE may be obtained from the Educational Testing Service, P.O. Box 955, Princeton, New Jersey 08541.

Academic Records

Domestic applicants should request that official transcripts be forwarded directly to their prospective major department or program. Two complete sets of official records covering all postsecondary academic work attempted, regardless of length of attendance, are required. University of California transcripts must also be requested by applicants, including those who are UCI undergraduates. Applicants with academic work in progress must expect to complete their undergraduate degree programs before the intended date of enrollment at UCI and must submit evidence of degree conferral before officially enrolling.

Foreign Academic Records

Official records from overseas institutions should be sent *directly* to the Office of Research and Graduate Studies at UCI. The Office will then forward the documents to the student's major department. Records of academic study from foreign institutions must be official, bearing the signature of the registrar and the seal of the issuing institution. Applicants should not send the original of an academic record which cannot be replaced; they should obtain instead properly certified copies. Unless academic records and diplomas are issued in English by the institution, the official records in their original language must be submitted with an authorized, complete, and exact English translation. Foreign academic records must be in duplicate and include all subjects or courses taken on a yearly basis, together with the units of credit or time allotted to each subject each term or year and the marks or ratings in each subject or examination passed. In all cases, the institutional grading scale or other standard of evaluation, including maximal passing and failing marks and definition of grades between them, should appear on official records or as an official attachment. Official evidence

of degree conferral must also be supplied, together with evidence of rank in class if available.

Test of English as a Foreign Language (TOEFL)

All applicants whose primary language is not English are required to submit the test results of the TOEFL examination. The TOEFL examination should be taken at the earliest available date to allow for scores to be reported in time to meet the application deadlines. A score of 550 or better is required for admission consideration. Arrangements for taking the TOEFL may be made through the nearest United States Embassy or by writing to the Educational Testing Service, P.O. Box 2896, Princeton, New Jersey 08541.

Test of Spoken English (TSE)

All applicants whose primary language is not English and who wish to be considered for a Teaching Assistantship appointment must undergo and submit results for the Test of Spoken English (TSE). A minimum score of 220 is required in order for a TA offer to be made. (The Department of English and Comparative Literature requires a minimum score of 250.) The Test of Spoken English is given six times during the year at TOEFL test centers around the world. Information on taking the TSE may be obtained by writing to the Test of Spoken English, P.O. Box 2918, Princeton, New Jersey 08541.

Special Note to Foreign Applicants

Foreign applicants are required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses for the first year of their studies at UCI. A Foreign Applicant Questionnaire for the purpose of verifying the amount and source of funds available for graduate study will be forwarded to foreign applicants upon receipt of the completed Application for Admission. The required financial verification must be provided before visa forms can be issued.

Admission and Registration

A formal notice of the admission decision is sent to each applicant by the Dean of Graduate Studies as soon as possible after the application and complete records are received, and after the department has made a recommendation. Only the official Notification of Admission from the Dean of Graduate Studies constitutes formal admission to a graduate program at UCI. The official notification will be mailed well in advance of the beginning of the quarter for which application has been made.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter. Information on registration dates and procedures will be mailed to new applicants prior to the registration cycle.

If any applicant wishes to defer admission to a later academic quarter, the Office of Research and Graduate Studies must be notified in writing. After formal admission has been offered, the academic unit must approve a request for deferral.

Limited Status

University of California academic regulations provide for the admission of students to Limited Status for two purposes: (1) to prepare for admission to a graduate or professional program by enrolling for a prescribed set of courses; or (2) to

pursue a specific academic program which does not lead to a graduate degree. While Limited Status is intended to serve a broad range of educational objectives, the most common objective for which the Dean of Graduate Studies offers Limited Status admission is study leading to California education credentials. The general requirements for admission to Limited Status are the same as those for graduate admission, with the exception that Graduate Record Examination scores are not required. Admission to Limited Status is ordinarily for a period of three quarters (one academic year) and does not imply admission to a UCI graduate degree program at some later date.

Although Limited Status does not represent graduate standing, admission is offered by the Dean of Graduate Studies upon the recommendation of an academic unit which has agreed to oversee the student's program. Graduate courses taken while in Limited Status ordinarily qualify for transfer credit toward advanced degree requirements, but will not satisfy minimum degree or residency requirements for any UC graduate program to which the student eventually might be admitted.

Academic Advising

In each academic unit with an advanced degree program, there is at least one formally appointed Graduate Advisor or Director of Graduate Studies. The Graduate Advisor is a regular faculty member responsible for supervising graduate study in that unit, for monitoring the academic progress of graduate students, and for seeing that each graduate student is assigned a faculty advisor. The Graduate Advisor plays a key role in the academic lives of graduate students, advising students and other faculty members about program requirements and the academic policies of the Office of Research and Graduate Studies, approving study lists, and evaluating academic petitions. In many academic units the Graduate Advisor is instrumental in the nomination of students for fellowship support, the selection of students for assistantship and fellowship appointments, and in the supervision of graduate student teachers. In most schools there also is an Associate Dean for Graduate Studies who coordinates many of the functions which affect graduate students within that school. Both Graduate Advisors and Deans are important links between the student and the Dean of Graduate Studies.

Most graduate students also will have an individual faculty advisor or advising committee, especially after the first year of advanced study. When a student is advanced to candidacy for the Ph.D., the doctoral committee becomes the primary source of academic guidance; however, student academic petitions still must be approved by the Graduate Advisor.

Academic Policies

The academic policies described in this section of the Catalogue apply to students enrolled in study leading to graduate degrees and California education credentials. Other regulations and procedures of importance to graduate students are covered in the Academic Regulations and Enrollment and Other Procedures sections and in the description of each graduate program.

Scholastic Requirements

A graduate student is expected to make satisfactory progress toward an approved academic objective, as defined by the faculty of the program in accordance with policies of the Graduate Council, and to maintain a satisfactory grade point average for all work undertaken while enrolled in graduate study. Satisfactory progress is determined on the basis of both the recent academic record and overall performance. A

graduate student normally is expected to complete satisfactorily at least eight units of academic credit applicable to the graduate program in each regular academic session (unless on an approved Leave of Absence), and satisfy all requirements of the academic program according to an approved schedule. For a graduate student, only the grades A, A-, B+, B, and S represent satisfactory scholarship and may be applied toward advanced degree requirements. However, upon petition, a UCI course in which a grade of B- is earned may be accepted in partial satisfaction of the degree requirements if the student has a grade point average of at least 3.0 in all courses applicable to the degree. *Graduate students may not apply courses graded Pass or Not Pass toward any degree or satisfactory progress requirements. A grade point average below the B level (3.0 on a 4.0 scale) is not satisfactory, and a student whose grade point average is below that level is subject to academic disqualification.*

A student's academic progress ordinarily is evaluated on the basis of the academic record. A few weeks after the end of a quarter, an updated copy of each enrolled student's permanent academic record is available from the Registrar. This record lists all UCI courses for which a graduate student was enrolled (including courses taken through the Intercampus Exchange Program, see page 83), the grades assigned, and the cumulative grade point average. Formal candidacy for an advanced degree, degrees conferred, certain examinations passed, unit credit accepted from other institutions, and other important academic information is recorded also.

A graduate student who has not demonstrated satisfactory progress is not eligible for any academic appointment, such as Reader, Research Assistant, or Teaching Assistant, and may not hold a fellowship or other award which is based upon academic merit.

Grading

With the consent of the academic units involved, individual study and research courses at the graduate level may be graded Satisfactory or Unsatisfactory (S/U). Certain graduate courses are graded S/U only, with the approval of the Graduate Council. A grade of S is equivalent to a grade of B (3.0) or better. No credit is given for a course in which a grade of U was assigned.

Graduate students may take one course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program; may not be applied to the requirements for an advanced degree; and do not count toward the minimum number of units for which a graduate student must enroll.

The grade of Incomplete (I) may be assigned by an instructor when the student's work is of passing quality, but is incomplete because of circumstances beyond the student's control. Although Incomplete grades do not affect a graduate student's grade point average, they are an important factor in evaluating academic progress. The *maximum* amount of time that an instructor may allow for making up incomplete work is three quarters of enrollment, but stricter limits may be applied. When work is completed within the time allowed, the student should ask the instructor to submit a change of grade notice to the Registrar, ordinarily through the dean of the school in which the course was offered. If not made up within the time allowed, an I grade is recorded permanently.

IP (In Progress) is a transcript notation restricted to sequential courses extending over two or more quarters, for which use of the IP notation has been approved. When the last quarter of the sequence is completed, the grade for the final quarter is assigned for all quarters of the sequence. No credit is given until the student has completed the entire sequence.

A student who received an NR (No Report) transcript notation must immediately contact the instructor and arrange for the removal or replacement of the NR. After one quarter, an NR becomes an F which will remain permanently upon the student's record.

A graduate student may repeat once a course in which a grade below B (3.0) or a grade of U was received. Only the most recently earned grade is used in computing the student's grade point average for the first eight units of repeated work; thereafter both the earlier and the later grades are used.

Additional information about grading may be found in the Academic Regulations section.

Academic Disqualification

After consultation with the student's academic unit, the Dean of Graduate Studies may disqualify a student who has a grade point average in graduate and upper-division courses below 3.0 for two or more successive quarters; *or* fails to pass (or does not take) a required examination within the time specified for that graduate program; *or* does not maintain satisfactory academic progress toward completion of an approved program of study.

Unsatisfactory academic progress may be determined on the basis of explicit requirements, but the professional judgment of the faculty upon review of all graduate work undertaken by the student is paramount. Ordinarily, a student whose work does not meet academic standards will be given written notice and a reasonable period of time in which to make up all deficiencies.

Prior to taking final action to disqualify, the Dean of Graduate Studies ordinarily will notify a student who is subject to academic disqualification and will provide reasonable opportunity for the student to correct erroneous or outdated academic records, to submit other information or comments in writing, or to request a second review of his or her academic performance.

Upon written notice of academic disqualification by the Dean of Graduate Studies, disqualification will be noted on the formal academic record of that student. Following the formal notice of disqualification, the student may appeal to the Dean of Graduate Studies *only on the basis of procedural error*.

Academic Residence

A graduate student is considered to be in residence during an academic quarter if at least four units of academic credit are earned in regular upper-division or graduate courses. Credit for one academic quarter of residence may be earned by completing at least two units of credit in approved courses in each of two Summer Sessions. In the case of Ph.D. students, these must be consecutive sessions.

Enrollment Policy

Full-time academic enrollment ordinarily is expected of graduate students at the University of California. Full-time study is defined as enrollment in at least 12 units of upper-division or graduate academic credit per quarter, including credit for supervised research or teaching. Graduate students may enroll in lower-division courses with the approval of their

academic advisors, but such courses are not considered to be part of any graduate program.

Graduate students ordinarily may not receive credit for more than 12 units per quarter in graduate courses, or 16 units in upper-division courses, or a proportionate number in combination. Course loads in excess of 16 units must be approved in advance by both the student's Graduate Advisor and the Dean of Graduate Studies.

Although in most instances completion of an advanced degree at UCI requires full-time study, the University recognizes the legitimate need for part-time study opportunities and is committed to providing those opportunities wherever possible. Graduate degree programs may be opened to part-time students wherever good educational reasons exist for so doing. Under this policy, part-time enrollment at the graduate level is defined as enrollment for eight units or less, including enrollment in Physical Education classes. Within the guidelines and limitations on the application form available in the Office of Research and Graduate Studies, graduate students may petition for part-time status and, if the petition is approved, shall pay the full University Registration Fee and student activities fees, one-half the Educational Fee, and one-half the Nonresident Tuition Fee (if applicable).

Continuous Registration

A graduate student is expected to enroll for each regular academic session (fall, winter, and spring quarters) until all requirements for an advanced degree or credential have been completed, including final examinations and the submission of an approved thesis or dissertation. Enrollment is not official until all required fees have been paid and the student's Enrollment in Classes Petition is completed correctly, signed where necessary, and submitted to the Registrar. Students are responsible for ensuring that their course enrollment is correct. For more information, see the Enrollment and Other Procedures section.

A student engaged in study or research outside the State of California for an entire quarter ordinarily will register *in absentia*. Unless an official Leave of Absence has been granted, or a petition to pay the Filing Fee in lieu of registration has been approved by the Dean of Graduate Studies, a student who does not register by the final deadlines for any regular quarter will lose graduate standing, and candidacy for any advanced degree will lapse. Prior to resuming graduate study in the University, a former student must successfully apply for readmission. A readmitted student must register and then be advanced or reinstated to candidacy at least one quarter before receiving an advanced degree. A degree cannot be conferred earlier than the second quarter following readmission.

A graduate student who decides to leave the University after enrolling and paying fees for a quarter must file an official Notice of Withdrawal or Cancellation with the Dean of Graduate Studies. A graduate student in good academic standing who withdraws from graduate study and intends to return within one year may submit an application for a Leave of Absence. If the leave is approved, the student remains in good standing and need not apply for readmission in order to enroll at the expiration of the leave period.

Leave of Absence

A graduate student who withdraws from the University with the intention of returning within one year and wishes to avoid a lapse of student status should request a Leave of Absence. A Leave of Absence of up to one year's duration may be granted by the Dean of Graduate Studies upon the recommendation of the student's academic unit, subject to the following guidelines:

1. The student must have completed satisfactorily at least one quarter in residence and be in good academic standing. The leave must be consistent with the student's academic objectives.
2. Leave ordinarily is approved in cases of serious illness or other temporary disability, or temporary interruption of the student's academic program for other appropriate reasons.
3. A student on leave is not eligible for assistance from a University fellowship, research grant, or financial aid program, and may not hold an academic appointment or comparable University employment. During a period of leave, a student may not take comprehensive or qualifying examinations or earn academic credit (except by a transfer of credit from another institution approved in advance by the Dean of Graduate Studies). Leave may not be granted to students who intend to make use of most University resources or facilities (including housing), and it may be revoked if they do so.
4. A student failing to register for the next regular academic session following the expiration of leave will lose graduate standing and will be subject to the following readmission policy.

Readmission

A student who previously withdrew from the University, or whose student status has lapsed, may request readmission to graduate study by submitting an Application for Readmission with a \$35 fee, which is nonrefundable. The Dean of Graduate Studies may grant readmission when recommended by the academic unit. If readmitted, a student's previous academic work will be applied toward the requirements for an advanced degree only with the approval of the Graduate Advisor and the Dean of Graduate Studies. A readmitted student must satisfy the academic requirements in effect at the time of readmission and may be required to satisfy certain requirements a second time, including those for formal advancement to candidacy. A readmitted student must register and then be advanced or reinstated to candidacy at least one quarter before receiving an advanced degree, which will be conferred no earlier than the second quarter following readmission.

Intercampus Exchange Program

A graduate student in good standing who wishes to take advantage of educational opportunities available only at another campus of the University of California may do so through the Intercampus Exchange Program. Ordinarily, an exchange student will have demonstrated a high level of scholarship during at least one year of graduate study at the home campus and will have well-defined academic objectives. Approval of the faculty advisor, the host department(s), and the respective Deans of Graduate Studies is required. Direct arrangements between faculty members on the two campuses are encouraged so as to ensure that courses, seminars,

or facilities will be available to meet the participating student's needs. Students may take courses on more than one campus of the University in the same academic session.

The exchange student enrolls and pays fees on the home campus and then enrolls at the host campus, following the procedures of that Registrar's Office. A report of academic work completed will be transferred to the student's academic record on the home campus. Although eligible for all normal student services, the exchange student is a visitor and is not formally admitted to graduate study at the host campus. Application forms for the Intercampus Exchange Program may be obtained from the Office of Research and Graduate Studies and should be filed with the Office at least four weeks before the beginning of the quarter in order to avoid penalties for late filing of the study list.

Transfers of Credit

At least one-half of the course requirement for a master's degree must be completed while in residence as a graduate student at UCI. Credit for up to one-fifth of the minimum number of units required for a master's degree may be allowed for graduate-level work completed at another institution or through University Extension prior to first graduate enrollment at UCI. Such courses do not count toward the required number of units in 200-series courses. Up to one-half the units required may be accepted from another Graduate Division of the University of California. After enrollment, the student must initiate a formal petition for such credit. The acceptance of unit credit earned in another program must be recommended by the academic unit to which the student has been admitted and be approved by the Dean of Graduate Studies. No units of transfer credit will be given for any course in which a grade below B (3.0) or equivalent was assigned. Under no circumstances will grade credit be transferred.

A student currently enrolled in a master's degree program or on a Leave of Absence may receive unit credit (not grade credit) for graduate-level work completed at another institution or through University Extension only with the prior approval of the departmental Graduate Advisor and the Dean of Graduate Studies. No transfer credit will be given for any course in which a grade below B or equivalent was assigned.

A student who begins graduate study at UCI in the fall quarter will receive appropriate credit for courses taken in preceding UCI Summer Sessions, provided that the formal date of admission precedes Summer Session enrollment. Continuing graduate students will receive credit for courses taken in intervening UCI Summer Sessions.

Graduate Degrees

Master's Degrees

The master's degree is conferred at the end of the academic quarter in which all requirements have been satisfied, subject to the final approval of the Graduate Council. The student must be advanced to candidacy for the degree prior to the beginning of the final quarter of enrollment. Therefore, an application for advancement to candidacy, initiated by the student and approved by the academic unit, should be submitted to the Dean of Graduate Studies at least 30 days before the opening of the quarter in which the degree is expected.

The Master of Arts (M.A.) or Master of Science (M.S.) degree normally is attained by one of two routes: Plan I, a thesis; or Plan II, a comprehensive examination. Both require

a minimum of one year in residence, satisfactory completion of prescribed course work, and an appropriate demonstration of achievement. Plan I includes a minimum of seven courses (28 units), 20 units or more of which must be at the graduate level; a thesis; and a general examination. Plan II requires at least nine courses (36 units), including 24 units or more at the graduate level, and a comprehensive examination covering a broad range of subject matter in the discipline. Only approved 200-series courses completed while in residence at the University satisfy the minimum graduate course requirement. Some programs will have course requirements exceeding the minimums cited above and may have additional or alternative degree requirements. Please refer to the description of the specific program for more information.

Master of Fine Arts (M.F.A.) degrees are awarded by the School of Fine Arts (M.F.A. in Fine Arts, Dance, or Drama) and by the Program in Writing (M.F.A. in English) upon successful completion of the equivalent of two years or more of full-time study with an emphasis upon creative expression and professional development. Special thesis or comprehensive examination requirements are established for these programs.

Master of Arts in Teaching (M.A.T.) degrees are awarded upon successful completion of programs designed for the professional development of secondary school teachers and college instructors. A minimum of one year in residence is required, usually including Summer Session course work. A thesis project or other comparable evidence of professional attainment is part of each M.A.T. program.

Master of Business Administration (M.B.A.) degrees are awarded by the Graduate School of Management upon successful completion of the equivalent of two years of full-time study in the development of professional managerial skills.

Doctor of Philosophy Degree

The Doctor of Philosophy (Ph.D.) degree is awarded on the basis of evidence that the recipient possesses knowledge of a broad field of learning and expert mastery of a particular area of concentration within it. The research dissertation is expected to demonstrate critical judgment, intellectual synthesis, creativity, and skill in written communication.

The candidate for the Ph.D. is expected to be in full-time residence for at least six regular academic quarters. Four to six years of full-time academic work beyond the bachelor's degree typically is required to complete the degree. At the end of the first year or so of full-time study, many programs administer a preliminary examination on the student's mastery of fundamental knowledge in the discipline. Upon successfully demonstrating a high level of scholarship on this examination and after further study, the student will continue to a series of qualifying examinations which lead to formal advancement to candidacy for the Ph.D.

Graduate students ordinarily attain candidacy status for the Ph.D. degree when all preparatory work has been completed, when qualifying examinations have been passed, and when they are ready for the dissertation phase. Students are recommended for advancement to candidacy by unanimous vote of the candidacy committee appointed by the Dean of Graduate Studies on behalf of the Graduate Council. The proposed candidacy committee list must be submitted to the Office of Research and Graduate Studies (on the Ph.D. Form I) at least two weeks before the final qualifying examination is to be given, so that formal appointment can be made before the examination date. The Report on Qualifying Examination for the Degree of Doctor of Philosophy (Form II) must be signed by the committee at the time the candidacy

examination is concluded and submitted to the Dean of Graduate Studies. Following a unanimous favorable vote of the committee, the student will be advanced to candidacy upon payment of the \$25 Candidacy Fee. Candidacy for the Ph.D. will lapse automatically if the student loses graduate standing by academic disqualification or failure to comply with the University policy on continuous registration. A readmitted student who was a candidate for the Ph.D. must again advance to candidacy and thereafter enroll as a candidate for at least one academic quarter before the Ph.D. may be conferred.

Following advancement to candidacy for the Ph.D., a doctoral committee appointed by the Dean of Graduate Studies (on behalf of the Graduate Council) supervises the student's program, approves the dissertation, and conducts the final oral examination if required. The chair of the doctoral committee is the member of the faculty responsible for providing primary guidance of the student's dissertation. Ordinarily, the final examination will be given just prior to completion of the dissertation and while the student is in residence during a regular academic session, and will be open to all members of the academic community. Ph.D. degrees are conferred, subject to the final approval of the Graduate Council, as of the last day of the regular academic quarter in which all requirements have been satisfied.

The In-Candidacy Fee Offset Grant

By action of each academic unit, the Graduate Council, and the Academic Senate Coordinating Committee on Graduate Affairs, a Normative Time has been established for each Ph.D. program. This is the expected number of 12-month years from first enrollment to completion of the Ph.D. for students entering with normal preparation who are able to study without serious interruptions. The Normative Time established for UCI Ph.D. programs is five years in all fields except (years in parentheses): Administration (six), Anatomy and Neurobiology (four), Classics (six), Comparative Culture (six), Comparative Literature (six), English (six), French (six), German (six), History (six), Information and Computer Science (six), Philosophy (six), Physics (six), Social Ecology (six), Spanish (six).

A Ph.D. student in good standing will be eligible for a quarterly grant equal to the Educational Fee if:

1. the student is a formal candidate for the Ph.D., as of the first day of the quarter;
2. the student's accrued time since first enrollment is less than the Normative Time for completion of the Ph.D. established for that graduate program (accrued time is equal to elapsed time from first enrollment as a UCI graduate student less (a) up to three quarters of approved leave, and (b) any time between completion of a graduate program or formal withdrawal and readmission in a different field of study);
3. the student is not entitled to payment of the Educational Fee from an extramural fellowship, grant, or traineeship; and
4. satisfactory academic progress has been certified by the Graduate Advisor.

Additional information about the In-Candidacy Fee Offset Grant program and application forms are available from the Office of Research and Graduate Studies.

Theses and Dissertations

Candidates for the Ph.D. and certain master's degrees must conduct an extensive research project and submit a thesis or dissertation in order to fulfill degree requirements. Research expenses are not supported by the University, and the cost of preparing the thesis or dissertation ordinarily ranges from \$200 to \$1,000, but may be considerably more.

Soon after advancement to candidacy, those Ph.D. or master's candidates who are writing a thesis or dissertation should consult with the Manuscript Advisor in the Office of Research and Graduate Studies. The Manuscript Advisor has the responsibility of ensuring that the established procedures and standards of UCI are upheld in the preparation of theses and dissertations. After approval by the doctoral or thesis committee appointed for each candidate by the Graduate Council, a copy of the dissertation (two copies of a master's thesis) must be filed with the Manuscript Advisor for placement in the UCI Library. The final copy must meet the University's requirements for style, format, and appearance before the degree can be conferred. Dissertations and theses must be filed no later than the end of the eighth week of instruction in order for them to be reviewed and accepted in time for the degree to be conferred in that quarter.

The Filing Fee

Under certain circumstances, a student may be eligible to pay a Filing Fee equal to half of the Registration Fee in lieu of registration, subject to the approval of the Dean of Graduate Studies. In general, all requirements for a degree must have been satisfied prior to the start of the quarter, except for the submission of the final version of the dissertation or thesis, or the completion of a final oral or comprehensive examination. The student who intends to make use of any University resource, to hold any academic appointment or comparable University employment, or to receive any student service for which official registration and payment of regular fees is a requirement is not eligible to pay the Filing Fee in lieu of registration. A Filing Fee will not be accepted immediately following readmission and will be accepted immediately following a Leave of Absence only under exceptional circumstances. The date for payment of the Filing Fee without a late service fee is the same as that for the payment of other student fees. If all degree requirements are not completed during the quarter in which the Filing Fee is paid, the student must subsequently register and pay all applicable fees.

Conferral of Graduate Degrees

Prior to the beginning of the quarter in which an advanced degree is to be conferred, the student must have advanced to candidacy for that degree and should have received formal notice confirming candidacy from the Dean of Graduate Studies. The student should consult the departmental Graduate Advisor to determine which degree requirements, if any, have not yet been satisfied.

No later than the beginning of the final quarter, the student should file a Diploma Information form with the Office of Research and Graduate Studies. If a master's thesis or doctoral dissertation is to be submitted, the Manuscript Advisor should be consulted well in advance about the final format and the deadline for submission of the approved manuscript.

Students are advised by mail when their diplomas are available, which is approximately six months after the quarter in which the degrees are awarded.

Financial Assistance for Graduate Students

Several types of financial assistance are available to graduate students at UCI. These include fellowships, teaching and research assistantships, tuition fellowships for nonresident students, grants-in-aid, student loans, and Work-Study. Applicants interested in assistantships or fellowships should so indicate on their application when applying for admission.

For all graduate programs, applications should be completed by January 1 to receive full consideration for fellowship and assistantship awards. Continuing students interested in an assistantship or fellowship should contact the Graduate Advisor for their program. The awarding of fellowships for the following academic year will be made during the month of April.

UCI subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards of financial support are given until April 15 to accept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student to not accepting another appointment without first obtaining formal release for that purpose from the awarding institution.

Regents' and UCI Chancellor's Fellowships are awarded to a number of promising students entering graduate study at UCI leading to the Doctor of Philosophy or Master of Fine Arts degree. Awards include a stipend, all required student fees, and, if applicable, Nonresident Tuition. Other fellowships are offered, including tuition awards for outstanding applicants who are not residents of California. In many cases, fellowship stipends may be supplemented by partial assistantship appointments.

Entering or continuing graduate students may be awarded research or teaching assistantships for all or part of the academic year. The types of assistantships, number available, and required duties vary according to the activities of the academic unit. Neither assistantship includes remission of fees or tuition, but a graduate assistant who is not a California resident also may receive a tuition fellowship.

Through the Graduate and Professional Opportunity Program, a number of fellowships and assistantships are awarded to entering and continuing graduate students from groups including minorities and women in certain fields who traditionally have been underrepresented in higher education in the United States. All fellowship awards and assistantships appointments are made in accordance with the affirmative action policies of the University.

A limited number of dissertation fellowships are awarded each year; additional information is available from the Office of Research and Graduate Studies; telephone (714) 856-6761. The Office also provides information and assistance to students who wish to apply for fellowships from federal agencies, foundations, and other non-University sources.

The Expenses and Fees and Financial Aid sections contain information about assistance based upon financial need that is administered by the Financial Aid Office, including grants, loans, and Work-Study awards. A Financial Aid Handbook is available from the Financial Aid Office.

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Kenneth H. Ibsen, Ph.D. University of California, Los Angeles, *Associate Professor of Biological Chemistry and Biological Sciences*

Paul J. Isackson, Ph.D. University of Kansas, *Assistant Adjunct Professor of Anatomy and Neurobiology and of Biological Chemistry*

Russell E. Jacobs, Ph.D. Stanford University, *Assistant Professor of Physiology and Biophysics and of Biological Sciences in Residence*

Edward G. Jones, M.D., Ph.D. Oxford University, *Chair of the Department of Anatomy and Neurobiology and Professor of Anatomy and Neurobiology and Biological Sciences*

Robert K. Josephson, Ph.D. University of California, Los Angeles, *Professor of Biological Sciences*

Mary-Louise Kean, Ph.D. Massachusetts Institute of Technology, *Associate Vice Chancellor Academic Plans and Programs and Professor of Biological Sciences and Cognitive Science*

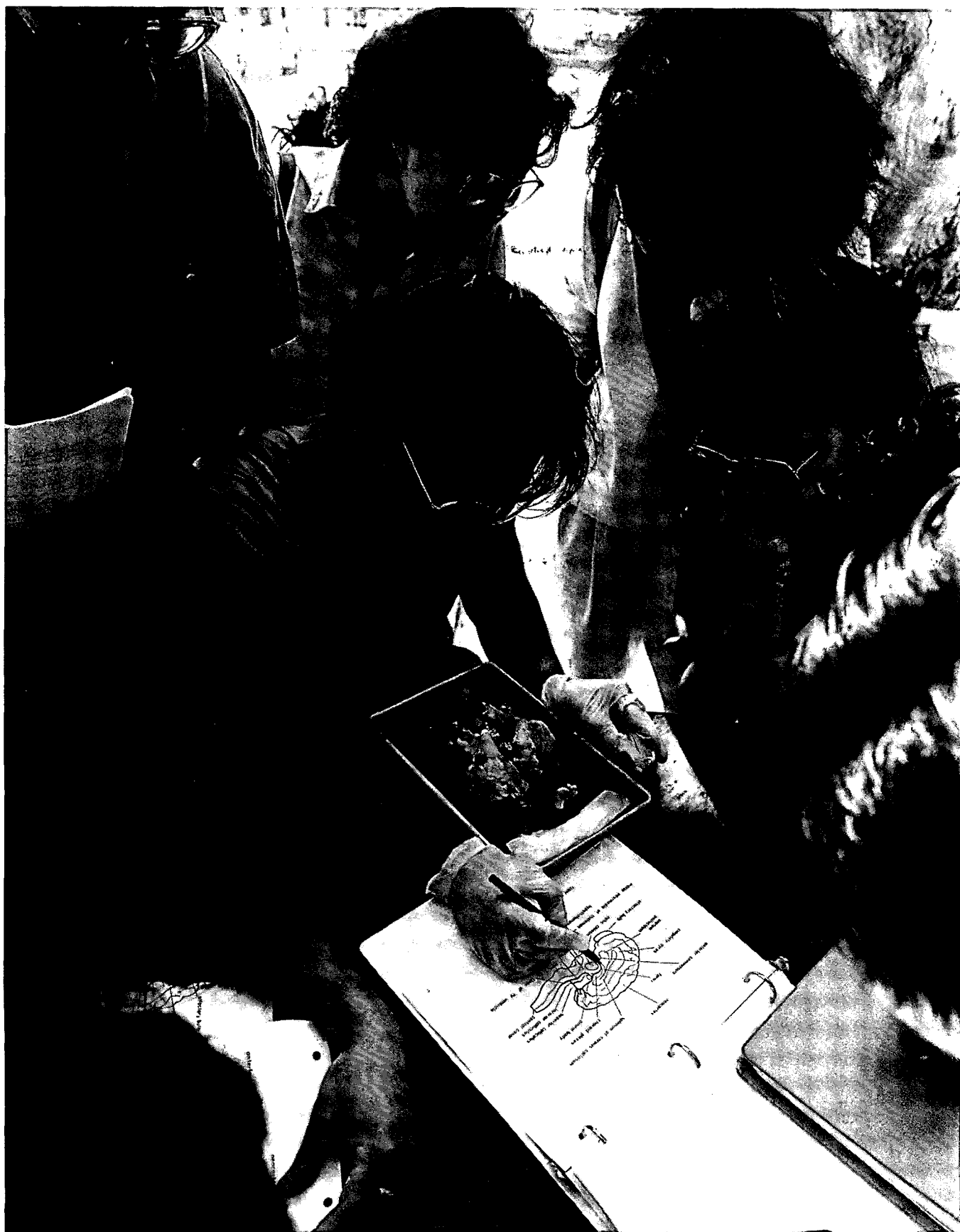
Herbert P. Killackey, Ph.D. Duke University, *Professor of Biological Sciences and of Anatomy and Neurobiology*

Leonard M. Kitzes, Ph.D. University of California, Irvine, *Associate Professor of Anatomy and Neurobiology and Biological Sciences*

Daniel J. Knauer, Ph.D. University of Nebraska, *Assistant Professor of Biological Sciences*

Harold Koopowitz, Ph.D. University of California, Los Angeles, *Director, UCI Arboretum and Professor of Biological Sciences*

Stuart M. Krassner, Sc.D. The Johns Hopkins University, *Professor of Biological Sciences*



Psychobiology is one of the major concepts in modern biology presented through the Biological Sciences Core, an eight-quarter sequence of undergraduate lectures and laboratories.

- Janos K. Lanyi, Ph.D. Harvard University, *Professor of Physiology and Biophysics, Microbiology and Molecular Genetics, and Biological Sciences*
- George V. Lauder, Ph.D. Harvard University, *Associate Dean of the School of Biological Sciences and Associate Professor of Biological Sciences*
- Howard M. Lenhoff, Ph.D. The Johns Hopkins University, *Professor of Biological Sciences*
- Richard E. Lenski, Ph.D. University of North Carolina, Chapel Hill, *Associate Professor of Biological Sciences*
- Michael Leon, Ph.D. University of Chicago, *Professor of Biological Sciences*
- Kenneth J. Longmuir, Ph.D. University of Oregon, *Assistant Professor of Physiology and Biophysics and Biological Sciences*
- Gary S. Lynch, Ph.D. Princeton University, *Professor of Biological Sciences and Social Sciences*
- Richard E. MacMillen, Ph.D. University of California, Los Angeles, *Chair of the Department of Ecology and Evolutionary Biology and Professor of Biological Sciences*
- Jerry E. Manning, Ph.D. University of Utah, *Professor of Biological Sciences*
- J. Lawrence Marsh, Ph.D. University of Washington, *Associate Professor of Biological Sciences*
- John F. Marshall, Ph.D. University of Pennsylvania, *Professor of Biological Sciences*
- Lee McAlister-Henn, Ph.D. University of Texas Health Science Center, Dallas, *Assistant Professor of Biochemistry and Biological Sciences*
- James L. McCaugh, Ph.D. University of California, Berkeley, *Director, Center for the Neurobiology of Learning and Memory, Professor of Biological Sciences and Social Sciences*
- Calvin S. McLaughlin, Ph.D. Massachusetts Institute of Technology, *Professor of Biochemistry and Biological Sciences*
- Ronald L. Meyer, Ph.D. California Institute of Technology, *Associate Professor of Biological Sciences*
- Ricardo Miledi, M.D. Universidad Nacional Autónoma de Mexico, *UCI Distinguished Professor and Professor of Psychobiology*
- Harris S. Moyed, Ph.D. University of Pennsylvania, *Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Laurence D. Mueller, Ph.D. University of California, Davis, *Associate Professor of Biological Sciences*
- R. Michael Mulligan, Ph.D. Michigan State University, *Assistant Professor of Biological Sciences*
- Ben A. Murray, Ph.D. Case Western Reserve University, *Assistant Professor of Biological Sciences*
- Masayasu Nomura, Ph.D. University of Tokyo, *Professor of Biological Chemistry, Microbiology and Molecular Genetics, and Biological Sciences and Grace Bell Chair in Biochemistry*
- Michael B. O'Connor, Ph.D. Tufts University, *Assistant Professor of Biological Sciences*
- Diane K. O'Dowd, Ph.D. University of California, San Diego, *Assistant Professor in Residence of Anatomy and Neurobiology*
- Ian Parker, Ph.D. University College, London, *Assistant Professor of Psychobiology*
- Charles E. Ribak, Ph.D. Boston University, *Associate Professor of Anatomy and Neurobiology and Biological Sciences*
- Richard T. Robertson, Ph.D. University of California, Irvine, *Vice Chair of the Department of Anatomy and Neurobiology and Associate Professor of Anatomy and Neurobiology and Biological Sciences*
- Eloy Rodriguez, Ph.D. University of Texas, Austin, *Faculty Assistant for International Affairs to the Executive Vice Chancellor and Professor of Biological Sciences*
- Michael R. Rose, Ph.D. University of Sussex, *Associate Professor of Biological Sciences*
- Suzanne B. Sandmeyer, Ph.D. University of Washington, *Assistant Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Rozanne Sandri-Goldin, Ph.D. The Johns Hopkins University, *Assistant Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Howard A. Schneiderman, Ph.D. Harvard University, *Professor of Biological Sciences (on leave)*
- John D. Scott, Ph.D. University of Aberdeen, *Assistant Professor of Physiology and Biophysics and of Biological Sciences*
- Bert L. Semler, Ph.D. University of California, San Diego, *Associate Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Malcom N. Semple, Ph.D. Monash University, *Assistant Adjunct Professor of Anatomy and Neurobiology*
- Donald Seneor, Ph.D. University of Washington, *Assistant Professor of Biological Sciences*
- Stephen J. Sharp, Ph.D. University of New South Wales, *Assistant Professor of Microbiology and Molecular Genetics and Biological Sciences*
- L. Dennis Smith, Ph.D. Indiana University, *Dean of the School of Biological Sciences and Professor of Biological Sciences*
- Martin A. Smith, Ph.D. University of Newcastle Upon Tyne, *Assistant Professor of Anatomy and Neurobiology*
- Eric J. Stanbridge, Ph.D. Stanford University, *Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Wendell M. Stanley, Jr., Ph.D. University of Wisconsin, *Associate Dean for Undergraduate Affairs of the School of Biological Sciences and Associate Professor of Biochemistry*
- Arnold Starr, M.D. New York University, *Professor of Neurology, Psychobiology, and Social Sciences*
- Robert Steele, Ph.D. Yale University, *Assistant Professor of Biological Chemistry and Biological Sciences*
- Grover C. Stephens, Ph.D. Northwestern University, *Professor of Biological Sciences*
- Katumi Sumikawa, Ph.D. Imperial College, London (England), *Assistant Professor of Biological Sciences*
- John E. Swett, Ph.D. University of California, Los Angeles, *Professor of Anatomy and Neurobiology and Biological Sciences*
- Paul S. Sypherd, Ph.D. Yale University, *Vice Chancellor for Research and Dean of Graduate Studies, and Professor of Microbiology and Molecular Genetics and Biological Sciences*
- Krishna K. Tewari, Ph.D. Lucknow University, *Chair of the Department of Molecular Biology and Biochemistry and Professor of Biological Sciences*
- Sujata Tewari, Ph.D. McGill University, *Associate Professor of Psychiatry and Human Behavior and Biological Sciences*
- Yasuhiro Torigoe, Ph.D. State University of New York, *Assistant Adjunct Professor of Anatomy and Neurobiology*
- Marcel Verzeano, M.D. University of Pisa Medical School (Italy), *Professor Emeritus of Psychobiology*
- Larry E. Vickery, Ph.D. University of California, Santa Barbara, *Associate Professor of Physiology and Biophysics and Biological Chemistry*
- Luis P. Villarreal, Ph.D. University of California, San Diego, *Associate Professor of Biological Sciences*
- Edward K. Wagner, Ph.D. Massachusetts Institute of Technology, *Professor of Biological Sciences*
- Harry Walter, Ph.D. Indiana University, *Professor of Physiology and Biophysics and Biological Sciences in Residence*
- Robert C. Warner, Ph.D. New York University, *Professor Emeritus of Biochemistry*
- John J. Wasmuth, Ph.D. Purdue University, *Professor of Biological Chemistry and Biological Sciences*
- Norman M. Weinberger, Ph.D. Western Reserve University, *Professor of Biological Sciences*
- Arthur E. Weis, Ph.D. University of Illinois, *Assistant Professor of Biological Sciences*
- Stephen G. Weller, Ph.D. University of California, Berkeley, *Associate Professor of Biological Sciences*
- Stephen H. White, Ph.D. University of Washington, *Professor of Physiology and Biophysics and Biological Sciences*
- Clifford A. Woolfolk, Ph.D. University of Washington, *Associate Professor of Biological Sciences*
- Pauline I. Yahr, Ph.D. University of Texas, *Professor of Biological Sciences*

No one can predict the future, but this much is known: the next quarter century is the time of the biologist, who will be in the midst of many of the activities that govern major aspects of life. These include some of the most challenging intellectual problems, such as the mechanisms of memory and of learning, the molecular basis of embryonic development, and the rules that help predict the behavior of the environment. Biology also lies at the heart of major social

problems that face mankind in the coming decade, such as sensible management of the environment and the effective control of human populations. It is vital that educated men and women understand the contributions that biological sciences have made and will continue to make for the future welfare of human beings.

The School of Biological Sciences reflects new concepts of biology in both its curriculum and its research programs. The faculty is dedicated to providing students with the opportunity to avail themselves of the principles and ever-increasing knowledge of biology. The curriculum is designed to meet present and future educational needs of majors and non-majors. In keeping with the responsibilities of the University, the School encourages vigorous faculty and student research programs. It strongly believes that excellence in research is essential for effective, enthusiastic, and up-to-date teaching. The School provides an excellent opportunity for undergraduates to participate in research, through the Biological Sciences 199 program. Each quarter more than 450 undergraduate students and 200 graduate and postdoctoral students participate in independent research programs.

In addition to the regular University requirements for admission, students interested in the biological sciences should include in their high school curriculum, in addition to a course in biology, four years of mathematics, as well as courses in chemistry and physics, which are now an integral part of most contemporary biological work.

The biological sciences are presented as an integrated area of study through the eight-quarter Biological Sciences Core, with lectures and laboratories developing the major concepts of modern biology. Satellite courses expand upon and intensify areas covered in the Core and provide students with the opportunity to specialize in a particular area of the biological sciences. In addition to the regular major in Biological Sciences, a concentration in Ecology and Environmental Biology, also leading to a B.S. degree in Biological Sciences, is available at the undergraduate level. The degree requirements of these two programs are similar, with the concentration in Ecology and Environmental Biology placing a greater emphasis on ecology and the natural sciences and a lesser emphasis on chemistry and molecular biology. Introductory courses for nonmajors are designed to make the biological sciences meaningful and interesting and to inform intelligent citizens of biological phenomena that affect their daily lives. Graduate courses are offered in all the departments.

Students with an interest in the application of ecology to human needs may choose the Applied Ecology major, leading to a B.A. degree in Applied Ecology, which is offered jointly by the School of Biological Sciences and the Program in Social Ecology. See page 259.

Degrees

Biological Sciences B.S., M.S., Ph.D.

A concentration in Ecology and Environmental Biology is available at the undergraduate level. Opportunities are available at the graduate level to specialize in developmental and cell biology, ecology and evolutionary biology, molecular biology and biochemistry, psychobiology, anatomy and neurobiology, microbiology and molecular genetics, and physiology and biophysics.

Applied Ecology (offered jointly with the Program in Social Ecology) B.A.

Honors

Graduation with Honors. Of the graduating seniors, approximately 12 percent may receive honors: 1 percent *summa cum*

laude, 3 percent *magna cum laude*, and 8 percent *cum laude*.

The selection for these awards is based on winter quarter rank-ordered grade point averages. A general criterion is that students must have completed at least 72 units in residence at a University of California campus.

Biological Sciences Scholastic Honor Society. The Biological Sciences Scholastic Honor Society is composed of students who graduate with an overall grade point average of 3.5 or better and have carried 12 or more graded units with a grade point average of 3.5 per quarter for a minimum of six quarters. Their names will be inscribed on a permanent plaque in the Biological Sciences Student Affairs Office.

Dean's Honor List. The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

Dean's Academic Achievement and Service Awards. Four Biological Sciences majors will be the recipients of the Dean's Academic Achievement and Service Awards. These awards are based on academic excellence and exceptional service to the School of Biological Sciences.

Excellence in Research Award. Undergraduates who have successfully completed the requirements for this program (detailed on p. 92) are presented with Excellence in Research certificates.

Robert H. Avnet Memorial Scholarship. The Robert H. Avnet Memorial Scholarship has been established to assist a student interested in becoming a physician. The student must be a Biological Sciences major and demonstrate financial need.

Lisa E. George Memorial Scholarship. The Lisa E. George Memorial Scholarship has been established by Delta Sigma Theta, Inc., and the School of Biological Sciences to assist women Biological Science majors who are from a recognized underrepresented minority group. The recipient must demonstrate academic excellence, leadership, service to the community, financial need, and a commitment to the pursuit of higher education.

Ralph W. Gerard Award. Three students receiving the highest ratings for their papers and oral presentations at the Excellence in Research Program will receive the Ralph W. Gerard Award.

Dr. William F. Holcomb Scholarship. The intent of the Dr. William F. Holcomb Scholarship is to support biomedical or marine biological studies. The Scholarship is to be used to support continuing academic work over a specific period.

Laurence J. Mehlman Prize. The Laurence J. Mehlman Prize is awarded to an undergraduate student in the School of Biological Sciences who has demonstrated outstanding achievement in both scholarship and service to the School.

Jayne Unzelman Scholarship. The Jayne Unzelman Scholarship is presented to an undergraduate student who has shown academic excellence and been of service to the School of Biological Sciences and/or the University, and to the community.

Robert Ernst Prize for Excellence in Student Research in Plant Biology. This prize is awarded to a student for meritorious research conducted in plant biology.

Robert Ernst Prize for Excellence in Research in the Biological Sciences. This prize is awarded to a student for meritorious research conducted in the field of biology.

Edward A. Steinhaus Memorial Award. The Edward A. Steinhaus Memorial Award is given to an outstanding graduate Teaching Assistant. Three second-place awards also are given.

Special Service Awards. These awards are given to students who have demonstrated great service to the School, the University, and/or community.

The preceding Honors, Scholarships, Prizes, and Awards are presented at the annual Biological Sciences Honors Convocation held the first week of June.

Requirements for the B.S. Degree in Biological Sciences

University Requirements: See pages 52-55.

School Requirements

Biological Sciences Core Curriculum (90, 101, 102, 103, 103L, 104, 104L, 105, 105L, 106, 106L, 107); minimum of three satellite courses; Chemistry 1A-B-C, 51A-B-C, and 1LB-LC, 51LA-LB; Mathematics 2A-B-C or 2A-B and one quarter statistics; Physics 3A-B-C, 3LA-LB or 5A-B-C, 5LB-LC; and Humanities 1A-B-C, or another option of the lower-division writing requirement of the breadth requirement (Category I) and a three-quarter sequence in either Humanities or Literature (Category IV, Humanistic Inquiry).

Students must have a 2.0 cumulative grade point average in the Biological Sciences Core Curriculum and three satellite courses.

In addition to the listed Biological Sciences satellite courses, Chemistry 130A-B-C or 131A-B-C can be used to satisfy the satellite requirement. Students with a double major in Psychology and Biological Sciences can also use Psychology 151A-B-C to satisfy the satellite requirement.

No student may enter as a double major, but students interested in other areas may possibly become double majors after

the first quarter, if the second school or program approves. A strong academic performance in the second area is requisite for acceptance as a double major.

For information on requirements for the B.S. degree in Biological Sciences with a concentration in Ecology and Environmental Biology, see page 91.

UCI Breadth Requirement

Those students majoring in Biological Sciences who have completed the School requirements and who have passed any two quarters of the writing component of the Humanities Core or its alternative with a grade of C or better will have satisfied the UCI breadth requirement, with two exceptions: the upper-division writing requirement and Category III, Social and Behavioral Sciences.

Specifically, the Humanities Core or its alternative satisfies Category IV, Humanistic Inquiry; it also satisfies the lower-division writing requirement when two quarters of the writing component are passed with a grade of C or better. Chemistry and physics satisfy Category II, Natural Sciences. Category V, Foreign Language, Linguistics, Logic, Mathematics, and Computer Science, is satisfied by completion of the School mathematics requirement.

Planning a Program of Study

Since biological sciences courses are built upon a base of the physical sciences, it is important for students to take their required physical sciences early. The academic program shown below is only a suggested program. Students should consult the Biological Sciences Student Affairs Office for individual academic planning.

Freshmen will normally take eight units of the humanities requirement, Chemistry 1A, and a freshman seminar (Biological Sciences 2) during the fall quarter. Students with a score of 650 or higher on the mathematics part of the Scholastic Aptitude Test (SAT) may enroll in mathematics during the

Sample Program — Biological Sciences

	Freshman	Sophomore	Junior	Senior
Fall	Chem. 1A Human. 1A ^a Bio. 2 (Fr. Sem.) Math 2A ^b	Bio. Core Chem. 51A, LA Math 2A or Physics 3A, LA ^c	Bio. Core Physics 3A, LA or Elective ^d Bio. Satellite ^e Elective/Research	Bio. Core Bio. Satellite Research Elective
Winter	Bio. Sci. 90 Chem. 1B, LB Human. 1B Math 2B	Bio. Core Chem. 51B, LB Math 2B or Physics 3B, LB	Bio. Core Physics 3B, LB or Elective Bio. Satellite Elective/Research	Research Electives
Spring	Chem. 1C, LC Human. 1C Math 2C or 7	Bio. Core Chem. 51C Math 2C or 7, or Physics 3C	Bio. Core Physics 3C or Elective Bio. Satellite Elective/Research	Research Electives

^aStudents may replace Humanities 1A-B-C with another option of the lower-division writing requirement of the breadth requirement (Category I) and a three-quarter breadth sequence in either Humanities or Literature (Category IV, Humanistic Inquiry). Students must satisfy the Subject A requirement prior to fulfilling the lower-division writing requirement. Students taking Humanities 1A must also enroll in Writing Workshop (2 units) if they have not satisfied the Subject A requirement.

^bStudents with a score of 650 or higher on the mathematics portion of the Scholastic Aptitude Test (SAT) may begin mathematics as freshmen. Students with a score below 650 on the mathematics portion of the SAT should defer mathematics to their sophomore year. Please note the prerequisites for Mathematics 2A.

^cStudents who have completed mathematics in their freshman year may take Physics 3A-B-C and 3LA-LB in their sophomore year. Students who take the mathematics requirement in their sophomore year should defer physics to their junior year. Physics 3A-B-C is the course for nonmajors and is fully acceptable for a degree in the Biological Sciences. Physics 5A-B-C, which begins in the winter quarter, better prepares a student for Physical Chemistry 130A-B-C or 131A-B-C and for some graduate schools.

^dElectives should be chosen with the following purposes in mind: UCI breadth requirements; students' own breadth; preprofessional training.

^eIn addition to the listed biological sciences satellite courses, Chemistry 130A-B-C or 131A-B-C, and Psychology 151A-B-C (for Biological Sciences/Psychology double majors) are counted as satellites.

fall quarter and should note the prerequisites for Mathematics 2A. During their freshman year, students will begin the Biological Sciences Core with Biological Sciences 90.

Sophomores begin organic chemistry (Chemistry 51A), continue the Biological Sciences Core, and complete the Humanities requirement if they have not taken it during their freshman year. Sophomores often begin taking courses in other schools to meet the UCI breadth requirement and fulfill their mathematics requirement if they have not done so as freshmen. Sophomores who have completed the mathematics requirement as freshmen may enroll in physics. Students who intend to double major in Chemistry may be required to take Physics 5A-B-C in place of Physics 3A-B-C.

During their junior year, most majors continue the Biological Sciences Core and take physics if they have not yet done so. Juniors complete their breadth requirements and often become involved in the satellite course requirements and research. Since research and the content of most satellite courses are based upon material contained in the Core, it is usually preferable for students to have completed most of the Core before taking satellite courses or beginning their research.

Finally, during their senior year, students complete the Core, continue their research, and become involved in an area of specialization within the School.

Individualized accelerated programs of study are designed for students entering the School with strong backgrounds in biology. Please see page 92 for details regarding the Freshman Honors Curriculum.

A special program of study should be considered by students who enter the biological sciences with a weak background in the sciences and in writing skills. A weak background might consist of not completing high school chemistry or mathematics through trigonometry, and not satisfying the Subject A requirement before entering the University. This program allows a student to gain the necessary background skills and may require five years of study at the undergraduate level. Before beginning this program of study, students must see an academic counselor in the Biological Sciences Student Affairs Office.

Freshmen should complete English and Comparative Literature WR39A, Mathematics 1, Biological Sciences 2, and an additional humanities course (to satisfy the alternative to the Humanities Core) during the fall quarter. The winter quarter should include Chemistry 10 and continuation of humanities and mathematics. Continuation of humanities and mathematics, and an elective, are taken during the spring quarter.

During the second year, students should begin general chemistry (Chemistry 1A-B-C), continue working on the breadth requirement and any remaining humanities requirements, and complete mathematics. During winter quarter, students will begin the Biological Sciences Core with Biological Sciences 90.

The Biological Sciences Core, organic chemistry (Chemistry 51A-B-C), and elective courses should be taken during the third year.

The fourth year should include Physics 3A-B-C, continuation of the Biological Sciences Core, biological sciences satellites, and possibly research or other electives.

The fifth year should be relatively free to explore additional satellites and research and to complete any remaining Biological Sciences Core Courses.

Requirements for the B.S. Degree in Biological Sciences with a Concentration in Ecology and Environmental Biology

The School of Biological Sciences offers a concentration in Ecology and Environmental Biology which provides a second pathway to a B.S. degree in Biological Sciences. The concentration in Ecology and Environmental Biology differs from the regular undergraduate program in having a greater emphasis on ecology and the natural sciences and a lesser emphasis on chemistry and molecular biology. Its principal objective is to afford the student an integrated, interdisciplinary program in environmental studies within the framework of a broad and rigorous physical and biological sciences background. A vital goal is to allow the student completing the course of study to be broadly trained as a biologist, with

Sample Program — Ecology and Environmental Biology Concentration

	Freshman	Sophomore	Junior	Senior
Fall	Bio. Sci. 2 (Seminar) Chem. 1A Human. 1A ^a Math 2A ^b	Bio. Sci. 101 Chem. 51A, LA Math 2A or Physics 3A, LA ^c Elective ^d	Bio. Sci. 104, 104L Bio. Sci. 166 Physics 3A, LA or Elective	Required Elective ^e Required Elective Elective Elective
Winter	Bio. Sci. 90 Chem. 1B, LB Human. 1B Math 2B	Bio. Sci. 102 Chem. 51B, LB Math 2B or Physics 3B, LB	Bio. Sci. 105 Bio. Sci. 120 Physics 3B, LB or Elective Breadth	Required Elective Elective Elective Elective
Spring	Chem. 1C, LC Human. 1C Statistics	Bio. Sci. 103, 103L ICS 1A or 21 Statistics or Physics 3C	Bio. Sci. 106, 106L Physics 3C or Elective Breadth	Required Elective Elective Elective Elective

^aStudents may replace Humanities 1A-B-C with another option of the lower-division writing requirement of the breadth requirement (Category I) and a three-quarter breadth sequence in either Humanities or Literature (Category IV, Humanistic Inquiry). (See School requirements for regular Biological Sciences majors and footnote "a" from the Sample Program for regular Biological Sciences majors.)

^bStudents with a score of 650 or higher on the mathematics section of the Scholastic Aptitude Test (SAT) may begin mathematics as freshmen. Students with a score below 650 on the mathematics section of the SAT should defer mathematics to their sophomore year.

^cStudents who have completed mathematics in their freshman year may take Physics 3A-B-C and 3LA-LB in their sophomore year. Students who take the mathematics requirements in their sophomore year should defer physics to their junior year.

^dElectives should be chosen with the following purposes in mind: UCI breadth requirements; students' own breadth; preprofessional training.

^eRequired electives are two courses selected from among various Biological Sciences courses and two courses selected from among various Social Ecology and Engineering courses. See School requirements for the Concentration in Ecology and Environmental Biology.

the breadth of educational experience to view environmental problems from an informed ecologist's perspective. In addition to completing basic required courses in the humanities and the physical and biological sciences, the student must complete a core of environmentally based courses from the Department of Ecology and Evolutionary Biology, the Program in Social Ecology, and the School of Engineering. Exposure to current thought in several subareas of ecology is emphasized, and the acquisition of elementary statistical and computer skills is stressed. Opportunities to specialize in several general study areas are furnished. Students will study theoretical concepts and experimental relationships in terrestrial or aquatic systems through Ecology and Evolutionary Biology satellite courses, but may also choose to specialize in the demographic and planning aspects of environmental management through classes in Social Ecology.

Students should also investigate the Applied Ecology major (p. 259), offered jointly by the School of Biological Sciences and the Program in Social Ecology. The Applied Ecology major emphasizes ecology as it pertains to human needs, whereas the concentration in Ecology and Environmental Biology emphasizes ecology as a basic science.

University Requirements: See pages 52-55.

School Requirements

Biological Sciences 90, 101, 102, 103, 103L, 104, 104L, 105, 106, 106L, 120, 166. Two required electives from: Biological Sciences 150, 168, 169, 173, 174, 179, 186; and two required electives from Social Ecology E120, E125, E158, E162, E171, E173, Engineering CE173, ME164. Chemistry 1A-B-C, 51A-B and 1LB-LC, 51LA-LB; Information and Computer Science 1A or 21; Mathematics 2A-B and one quarter statistics; Physics 3A-B-C, 3LA-LB; and Humanities 1A-B-C, or another option of the lower-division writing requirement of the breadth requirement (Category I) and a three-quarter sequence in either Humanities or Literature (Category IV, Humanistic Inquiry).

Students must attain a 2.0 grade point average in required Biological Sciences courses.

Planning a Program of Study

A normal program of study for the concentration in Ecology and Environmental Biology is similar to that for the regular Biological Sciences major. A program of study in Ecology and Environmental Biology requires Biological Sciences 166 and 120. In addition, required electives in biological sciences, engineering, and social ecology replace the requirement for three satellite courses.

The UCI breadth requirement may be satisfied in the concentration in Ecology and Environmental Biology in the same manner as the regular Biological Sciences major.

Further clarification on the concentration in Ecology and Environmental Biology may be obtained from the Biological Sciences Student Affairs Office.

Special Programs and Courses

Freshman Honors Curriculum

Individually accelerated programs of study can be designed for freshman students who enter the School of Biological Sciences with strong backgrounds in biology and who have achieved scores of 4 or 5 in the biology section of the Advanced Placement Examination. Such freshmen are exempt from the first course in the Biological Sciences Core (Biological Sciences 90, Diversity of Life) and begin the second Core course (Biological Sciences 101, Evolutionary Biology and Genetics) during the fall quarter of their first

year. This program enables participants to complete the fourth Core course by the end of their first year. Any student with such Advanced Placement credit should contact the Biological Sciences Student Affairs Office for more information regarding this program.

Biological Sciences 199

Every undergraduate student in the School of Biological Sciences has the opportunity to pursue independent experimental laboratory or field research under the direct supervision of a professor in the School of Biological Sciences or in the College of Medicine as an apprentice scientist. Under the guidance of a senior scientist, the student is able to experience the challenge and excitement of the world of science and to develop new scientific skills. This activity may commence as early as the sophomore year or, in the case of exceptional students, earlier.

Interested students should investigate the possibilities for research early in order to obtain a great deal of research experience, if they so desire, before they graduate. Although the School of Biological Sciences does not require training in a foreign language, some areas of research demand that students possess foreign language skills. Students are, therefore, encouraged to discuss foreign language needs with their advisors to see if such training is important for their own careers. Advising for research careers in the biological sciences is best accomplished by students working together with a faculty advisor.

Excellence in Research Program

The School of Biological Sciences believes that successful participation in creative research is one of the highest academic goals its undergraduates can attain and accordingly rewards such students with Excellence in Biological Sciences Research certificates. Through undergraduate research and the Excellence in Research Program in Biological Sciences, students have the opportunity of presenting the results of their research endeavors to peers and faculty, and possibly of seeing their research papers published. Selected papers are published in the School's *Journal of Undergraduate Research in the Biological Sciences*.

All Biological Sciences majors doing experimental research under Biological Sciences 199 who have completed a minimum of three quarters on the same project (with at least one quarter taken during the academic year of the symposium) are eligible to participate. They must be in good academic standing, have a grade point average of 2.7 or better, and be making normal progress in Biological Sciences.

Ecology Super Course

During one quarter of alternate academic years (and usually in the spring quarter), several courses are combined into a Super Course. These courses, together with a Biological Sciences 199 (Independent Study in Biological Sciences Research), constitute the student's entire curriculum for that particular quarter. (During any quarter in which the Super Course is taught, students may not enroll in part of the Super Course requirements individually.) Extensive fieldwork is involved. Enrollment is limited to 20 students, with selection based upon application and an interview at the end of the preceding quarter. Prerequisites are completion of Biological Sciences 102 and consent of instructor.

Undergraduate Focal Areas

Undergraduate students have the opportunity to focus in one or more specific areas of biology by taking a series of related courses within the School's curriculum. The areas and courses for 1989-90 are listed below. (Graduate status or consent of instructor is required of all students taking graduate-level courses.)

Anatomy: Biological Sciences 148, 156, 157, 164

Animal Physiology: Biological Sciences 133, 138, 138L, 156, 160, 161, 162, 163, 170, 173, 188; Developmental and Cell Biology 210

Applied Ecology: Biological Sciences 20, 118, 118L, 119, 141, 143, 150

Aquatic Ecology: Biological Sciences 20, 118, 118L, 135, 169, 179

Biophysics: Chemistry 130A-B-C or 131A-B-C; Molecular Biology and Biochemistry 262

Cell Biology: Biological Sciences 129, 141, 144A, 144B, 151, 161, 192; Developmental and Cell Biology 205

Developmental Biology: Biological Sciences 136, 137B, 147, 148, 148L

Ecological Energetics: Biological Sciences 138, 138L, 173

Evolutionary Biology: Biological Sciences 91, 135, 168, 170, 174, 186; Ecology and Evolutionary Biology 220, 250

Genetics: Biological Sciences 128, 137A, 137B, 137C, 151, 168; Developmental and Cell Biology 230; Ecology and Evolutionary Biology 250; Molecular Biology and Biochemistry 207

Invertebrate Biology: Biological Sciences 135, 143, 169, 179, 188

Microbiology: Biological Sciences 121, 122, 122L, 124 (an organized one-year sequence in the basic microbiological sciences designed to meet the requirements of professional schools in the topic areas, e.g., medical technology); Molecular Biology and Biochemistry 221

Molecular Biology and Biochemistry: Biological Sciences 1B, 1F, 91, 121, 124, 125, 126, 128, 137A, 141, 153; Chemistry 130A-B-C or 131A-B-C; Ecology and Evolutionary Biology 250; Molecular Biology and Biochemistry 203, 204, 205, 206, 207, 209, 211, 214, 215, 217, 221, 226, 231, 262, 264

Molecular Genetics: Biological Sciences 124, 125, 128, 137A, 137B, 151; Ecology and Evolutionary Biology 250; Molecular Biology and Biochemistry 203, 204, 205, 206, 207, 209

Neurobiology and Behavior: Biological Sciences 108, 133, 152, 153, 154, 155, 156, 157, 158, 159, 161, 162, 163, 164, 165, 174

Organismic Biology: Biological Sciences 1G, 135, 143, 150, 168, 170, 173, 174, 187; Ecology and Evolutionary Biology 224

Plant Biology: Biological Sciences 129, 129L, 134A, 141, 147, 150; Ecology and Evolutionary Biology 230

Theoretical Ecology: Biological Sciences 120, 146, 150, 174, 186; Ecology and Evolutionary Biology 227, 229

Undergraduate Teaching Opportunities

Through the Tutoring Program, students can immediately put to practice skills they have learned in their biology training. This program provides opportunities for students to develop teaching abilities and to perform a worthwhile and necessary service. In the Tutoring Program, UCI students tutor other UCI students in biology, chemistry, mathematics, and physics.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61 and 62.

3-2 Program with the Graduate School of Management

Outstanding Biological Sciences majors who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students

normally apply for this program early in their junior year. See the Graduate School of Management section for further information.

Special Research Resources

Special research resources include the Beckman Laser Facility and Medical Clinic, a research, training, and service facility in the area of laser microbeam technology; the School of Biological Sciences Biohazard (P-3) Facility, which provides laboratory facilities for working with biological agents or biological molecules such as recombinant DNA which would be hazardous when used in open laboratories; the Museum of Systematic Biology, a teaching and research facility which currently contains material on local populations of plants, invertebrates, and vertebrates; the Developmental Biology Center, devoted to analyzing the cellular and genetic mechanisms underlying growth, development, and regeneration; the Center for the Neurobiology of Learning and Memory, a research center for studies of the brain mechanisms underlying learning and memory; the UCI Arboretum, a botanical garden facility; the San Joaquin Freshwater Marsh Reserve, which supports controlled marsh biota; the Burns Piñon Ridge Reserve, a high-desert habitat in San Bernardino County; the Theoretical Neurobiology Facility, which provides computational resources for physiologically realistic simulation of neuronal systems; and the UCI Ecological Preserve, which includes coastal hills on the campus, once under heavy grazing, but now returning to a more natural state. It is important to note that the School has access to the College of Medicine, thereby providing an opportunity for the sharing of both teaching and research activities.

Advising: Academic, Career, Health Sciences

Academic Advising

The Biological Sciences Student Affairs Office coordinates the advising program and provides academic counseling as well as special services particularly in the area of preprofessional career counseling. Undergraduate Biological Sciences students should consult the Biological Sciences Student Affairs Office for information on academic requirements for the degree, career opportunities, the Biological Sciences 199 Research Program, available tutoring for Biological Sciences courses, Biological Sciences student organizations, and scholarship information. Students can also come to the Biological Sciences Student Affairs Office to change a grade, change their major, apply for graduation, or for any other help they might need related to their academic career at UCI.

All freshmen will enroll in small-group freshman seminars (Biological Sciences 2) and all other new students will enroll in special sections of Biological Sciences 190. Upper-division peer advisors are actively involved in these seminars.

Peer Academic Advisors. The Peer Academic Advisors are upper-division Biological Sciences majors who bring with them valuable academic and social experiences. Their functions include counseling students in matters of major selection, program planning, petitioning, tutoring, learning skills problems, and participation in cocurricular and extracurricular activities.

The Peer Advisors are located in the Biological Sciences Student Affairs Office. Office hours are posted at the beginning of each quarter.

Career Advising

Information on graduate and professional schools in the health sciences can be obtained from the Biological Sciences Student Affairs Office. The UCI Career Planning and Placement Center (CPPC) provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71. The Student Affairs Office has developed a complete career library and a close relationship with the CPPC in an effort to provide current, relevant career information for biology students. Special events designed to provide career information are the annual Biological Sciences Career Fair and monthly career workshops, many of which are cosponsored by the Student Affairs Office and the CPPC.

Areas of opportunity open to those with a Bachelor of Science degree include laboratory technology, publishing, technical editing, pharmaceutical sales, and training programs in county, state, and federal agencies. The bachelor's degree is necessary to pursue studies leading to the M.S. and Ph.D. degrees.

A B.S. degree, plus short training periods, may prepare students for employment in education, medical technology (usually one year), physical therapy, and various other areas.

Education (community colleges, state colleges, or private schools), medical illustration, and public health (which includes hospital administration, biostatistics, epidemiology, environmental health sciences, social work, public health education, maternal and child health, and infectious and tropical diseases) are fields in which opportunities are available upon completion of a Master's program.

The Ph.D. degree may lead to research in many areas, among them biochemistry, biometeorology, botany, cytology, ecology, fishery biology, genetics, home economics, microbiology, molecular biology, pathology, physiology, psychobiology, public health, range management, soil conservation, and zoology.

Other areas where advanced degrees are necessary include medicine, dentistry, law, optometry, podiatry, osteopathy, and veterinary medicine.

Health Sciences Advising

Advising for careers in the health sciences is a specialty of the Biological Sciences Student Affairs Office. Students desiring to enter the health sciences should have their programs checked in the Office. They also should check deadlines for taking the New Medical College Admission Test (MCAT) or other required tests and application deadlines. The New MCAT and the Dental Admission Test, required by most medical and dental schools, are administered in spring and fall each year at UCI. These tests should be taken in the spring, a year and one-half before the student plans to enter medical or dental school.

Many Biological Sciences students desire a career related to their education in the biological sciences. Students can go into medicine, dentistry, optometry, osteopathy, podiatry, veterinary medicine, and related medical fields; into teaching; and into research in the biological sciences. In properly preparing for such careers, planning is essential early in a student's education.

Leaders in dental, medical, and veterinary education recommend that students preparing to seek admission to their schools plan to obtain a bachelor's degree. Students who plan to enter a school of dentistry, medicine, or other areas of the health sciences may receive the required preprofessional

training at UCI. This preprofessional training may be accomplished by (1) completing the major in Biological Sciences or (2) majoring in any school or department *and* fulfilling concurrently the specific course requirements of the dental, medical, or other professional school the student expects to attend.

Students interested in the health sciences should choose electives in the social sciences, possibly a foreign language, physical chemistry, or other specific courses required or recommended by graduate schools.

Health Sciences Advisory Committee

The Health Sciences Advisory Committee consists of faculty and academic counselors in the School of Biological Sciences. The Committee offers specialized services, for a fee, to all students applying to postgraduate professional schools in the health sciences, including (1) a Committee interview and letter of recommendation for most professional school applications, (2) a personal file containing the student's letters of recommendation, and (3) a service of sending all recommendations for a student to professional and graduate schools.

Student Participation

AED. Alpha Epsilon Delta (AED) is an international honor society for students preparing for careers in the health professions. AED strives to stimulate an appreciation of health careers through interaction among prehealth students, health educators, and practitioners in a variety of health care fields. AED annually sponsors workshops on interview techniques and a series of talks on selecting, applying to, and financing medical school. Blood drives, sponsored by AED and offered in conjunction with the UCI Medical Center and the Student Health Center, take place twice per quarter, while guest speakers from every aspect of the health care field highlight weekly meetings. AED recruits new members early in the fall and spring quarters. Because AED is an honor society, membership is contingent upon class ranking (the top 35 percent), completion of five quarters of academic work, and a brief pledge period, during which commitment to the society is assessed.

Asian Students for Health Sciences. Asian Students for the Health Sciences assists Asian pre-health students in attaining their career goals through providing opportunities to learn more about health careers via guest speakers and workshops. The organization also provides information about health professional schools and the application process to these schools, and sponsors tours to various campuses. Social interaction and friendships are promoted between students via counseling and social activities.

BSSO. The Black Students Science Organization (BSSO) was established to maintain a unified and supportive community of successful Black science and prehealth professional students at UCI. The group holds bimonthly meetings; sponsors guest speakers; provides academic support in the form of study sessions, examinations, and study aids from previous courses; organizes trips to medical schools, hospitals, and conferences; arranges gatherings with physicians and medical students; hosts fund-raising events; and compiles and disseminates information on careers, conferences, hospital and laboratory positions, and issues affecting the Black community in particular. BSSO also works in close association with the College of Medicine chapter of the Student National Medical Association. Major achievements have included "BSSO Week" and the cosponsoring of the annual UCI College of Medicine Third World Pre-Medical Awareness Conference.

CCM. Chicanos for Creative Medicine has been established to promote interaction among Biological Sciences and pre-health professional Chicano-Latino students at UCI. The aims of CCM are (1) to help members attain their career goals, (2) to provide resource information pertinent to the success of Chicano-Latino students at UCI, and (3) to create and maintain a sense of awareness and attitude of being a Chicano-Latino student at UCI. Activities include guest lecturers speaking on their research; Latino professionals, including physicians, dentists, and other health professionals, speaking on their careers; and quarterly fund-raising activities. The group works closely with the Chicano Medical Student Association of the College of Medicine and with the La Raza Medical Association, a Statewide organization.

CPSA. The Chinese Pre-health Student Association (CPSA) is dedicated to providing both academic and moral support to Asian Pacific students who are interested in pursuing careers in the health sciences. The organization's main goal is to introduce the students to a friendly and cooperative environment in which they may receive academic counseling and interact with other students with similar interests. Every year CPSA invites guest speakers from various health fields to talk about their professions. Faculty and counselors also are invited to give students a detailed overview of medical school admissions preparation and career developments in medicine. In addition, CPSA sponsors a variety of academic and social events such as picnics, dinners, exam reviews, athletic events, field trips, and workshops.

Dental Club. The Dental Club is designed to promote exposure to dentistry for students interested in a career in the dental profession. The Club provides an opportunity for students to learn about dentistry through listening to guest speakers and attending workshops featuring visiting dentists. The Dental Club helps students with their applications to dental school and offers information on dental schools, field trips to local schools, and counseling. The Club also offers mock Dental Admission Test examinations.

Medspur. Medspur is dedicated to serving the academic and social needs of pre-health students at UCI by assisting its members in the pursuit of their career goals. The UCI Chapter of Medspur was established ten years ago and is now one of the largest pre-health organizations on campus. Each year Medspur brings together approximately 100 students interested in medical and other health-related fields. Activities include guest speakers on current health issues and trends, health professional school tours, study sessions, and social events.

Flying Samaritans. The Flying Samaritans of UCI is comprised of student volunteers involved in health care at the Orange County Clinic in Santa Ana, California, and at the El Testerao Clinic in Baja California. One weekend per month, members staff the clinic in Mexico and help administer, translate, and otherwise assist health professionals in such duties as taking vital signs. Activities include an annual Christmas party at the El Testerao Clinic, and collection of clothing, food, and toys for distribution to people in need.

KHA. The Korean Health Association (KHA) was organized for Korean prehealth students to enhance their awareness of the diversity of health education opportunities. Although KHA concentrates on participants' academic concerns, it also provides opportunities for them to develop and strengthen friendships. The goals of KHA are (1) to assist students in achieving successful academic endeavors in undergraduate studies, (2) to offer assistance and consultation to students regarding their future health-related career goals, (3) to enable students to meet one another, and (4) to encourage peer

counseling and tutoring among students. The KHA also provides academic and career counseling and sponsors workshops which are presented by professionals who represent health-related careers.

U See Eyes. U See Eyes is dedicated to helping students interested in optometry learn more about the profession. Members have the opportunity to observe optometrists in different practice settings and tour the Southern California College of Optometry. Workshops on the application process and preparation for the optometry school entrance exam also are available.

Graduate Program

The School of Biological Sciences offers graduate study in a wide variety of fields ranging across the spectrum of the biological sciences. The four Departments of the School of Biological Sciences (Developmental and Cell Biology, Ecology and Evolutionary Biology, Molecular Biology and Biochemistry, and Psychobiology) and four Departments of the College of Medicine (Anatomy and Neurobiology, Biological Chemistry, Microbiology and Molecular Genetics, and Physiology and Biophysics) cooperate in the conduct of a unified graduate program, administered by the School of Biological Sciences. The organization of the Departments encourages an interdisciplinary approach to scientific problems, especially at the graduate level.

All programs of study, regardless of emphasis, lead to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in the Biological Sciences. Each Department has a graduate advisor whom students may consult in regard to the technical details of their individual programs.

Applications for admission to graduate study are evaluated both by the Office of Research and Graduate Studies and by the program or the Department to which the student has applied on the basis of letters of recommendation, Graduate Record Examination scores, grades, and other qualifications of the applicant. Candidates for graduate admission are urged to consult the department(s) whose faculty and expertise best fit their interests.

Some faculty are members of an interdisciplinary biophysics and biophysical chemistry group. These faculty are from the Department of Chemistry in the School of Physical Sciences; the Departments of Developmental and Cell Biology and Molecular Biology and Biochemistry in the School of Biological Sciences; and the Department of Physiology and Biophysics in the College of Medicine. This program provides an opportunity for interaction among graduate students and faculty who share common interests in biophysics and biophysical chemistry. Participating graduate students pursue a degree in the department best suited to their own background and research interests. A program of seminars brings the group together monthly to discuss research problems of mutual interest, and a regular series of interdisciplinary courses is offered by the participating faculty to provide formal instruction in areas encompassed by biophysics and biophysical chemistry.

Master of Science and Doctor of Philosophy in the Biological Sciences

While both the Master of Science and Doctor of Philosophy programs are offered, emphasis at the graduate level is on the Ph.D. programs. Most training takes place within one of the departments, although full facilities and curricular offerings are available to all graduate students in all departments of the biological sciences. Interdisciplinary study and research are encouraged.

Students are expected to maintain a B average at all times, attain the Master's degree in two years, and attain the Ph.D. in four or five years, depending on departmental affiliation. A Master's degree, however, is not a prerequisite for the Ph.D. degree.

During the first part of the initial year of graduate work, the student plans an academic program in consultation with the graduate advisor or a small committee. Faculty advisors are changed if the specific interests of the student change. In addition, it is possible for students to transfer to another program in the School, subject to the approval of the Dean of Graduate Studies, provided that they are acceptable into that program. Students are encouraged to consult with other faculty members with regard to their research and academic interests.

During their graduate training all students will serve some time as teacher apprentices under the direction of advanced teaching assistants and faculty. Advanced graduate students may work closely with faculty in the planning and execution of the teaching program. The amount and exact nature of the teaching experience varies with the department.

Master of Science

Depending upon the program, there are two plans by which a Master of Science degree may be obtained.

Plan I: Thesis Plan The student completes seven upper-division and graduate courses including a minimum of five nonresearch courses. The student then presents a thesis based upon research done while in the School.

Plan II: Comprehensive Examination Plan The student completes a minimum of nine upper-division and graduate courses. At least six must be graduate courses (numbered 200-299) in the student's field specialization. This program is terminated with a comprehensive final examination.

Doctor of Philosophy

First Level of Competence The student attains this level by completing oral or written examinations at the discretion of the department.

Second Level of Competence This level is attained by passing an examination dealing with the student's particular interests. A committee for the purpose of administering this examination is appointed by the Dean of Graduate Studies and Research.

Once this examination is completed, the student is advanced to candidacy for the degree and is considered to have formally begun dissertation research. The student submits a dissertation on this research and defends it at an oral examination during the final year of graduate study.

Courses for Nonmajors

Nonmajors may also take other courses for which they have the prerequisites.

1 Fundamentals of Modern Biology. Courses which, along with Biological Sciences 79, 80, and 81, provide the nonmajor with a fundamental knowledge of biology. Each course is an independent unit

with no prerequisites. Students may take any combination of courses within the collection.

1A Physiology (4) F, W. Lecture, three hours. How animal cells and animals work, with attention to the structure and function of the human body. (II)

1B Molecular Biology (4) W. Lecture, three hours. Molecules of life, with emphasis on medical applications. (II)

1C Introduction to Ecology (4) S, Summer. Lecture, three hours. Principles of ecology with application to populations, communities, ecosystems, and humans. Same as Social Ecology E6. (II)

1D Human Development: Conception to Birth (4) F, S. Lecture, three hours. Processes leading to the birth of a healthy child and the avoidance of birth defects. Male and female reproductive systems; hormonal control of egg-sperm formation; sexual intercourse; contraception and venereal diseases; fertilization; cell division; embryonic development; fetal physiology; pregnancy; birth, lactation; chromosomal aberrations; birth defects; human genetics; genetic disease; counseling. (II)

1E Botany (4) F, Summer. Lecture, three hours. Structure and function of flowering plants related to their roles in ecology and human needs. (II)

1F Molecular Basis of Human Disease (4) W. Lecture, three hours. Basic molecular biology and biochemistry of the human organism. Basic processes of disease in human populations are covered. Emphasis is on the molecular and biochemical basis of disease. (II)

1G California Natural History (4) S. Lecture, three hours. Introduction to ecological relationships within a variety of California habitats. Explores aspects of the physical environments and the adaptations of organisms to their physical and biological surroundings in habitats such as the coastal zone, mountains, and deserts. (II)

79-80-81 Biological Bases of Behavior. Lecture, three hours. Three introductory courses, each an independent unit with no prerequisites. Students may take any combination of courses within the collection.

79 How the Brain Works (4) F. The biology of the nervous system. The neuron, its structure and function. Role of glial cells. The physiology of nerve cell membranes and transmitter action. Emphasis on evolution and development of the nervous system. (II)

80 The Brain and Behavior (4) W. Brain mechanisms underlying psychological processes, including consciousness and sleep, sex, food and water intake, perception, learning, memory, and language. (II)

81 The Biology of Behavior Disorders (4) S. Current facts and theories regarding mental illness, genetic disorders, brain damage, sexual deviance, drug abuse, and intellectual functioning. (II)

Courses for Both Majors and Nonmajors

1E Botany (4) F, Summer. Lecture, three hours. Structure and function of flowering plants related to their roles in ecology and human needs. (II)

1G California Natural History (4) S. Lecture, three hours. Introduction to ecological relationships within a variety of California habitats. Explores aspects of the physical environments and the adaptations of organisms to their physical and biological surroundings in habitats such as the coastal zone, mountains, and deserts. (II)

20 Western Water Problems (4) W of odd years. Seminar, four hours. Minimum streamflow, anadromous fisheries, riparian habitats, and characteristics of western river systems. Ecological effects of dams and impoundments, western water law, and mitigation strategies. California and the Northwest are emphasized.

25 Biology of Cancer (4) W. Lecture, four hours. Biological, clinical, and psychosocial nature of cancer through the perspectives of medical researchers, biologists, physicians, and health educators. For students of all majors, designed so that each can increase personal awareness of the biology of cancer.

30 Biomedical Ethics (2) S. Seminar, three hours. Ethical issues inherent in modern biological and medical advances. Behavior modification, food and resources distribution, malpractice, and other current ethical issues are covered by scientists and community members. Discussion with the guest speaker. Pass/Not Pass only.

40 Biological Sciences Summer Science Program (4) Summer. Lecture, five hours; laboratory, three hours. Developmental approach to the study of a scientific subject. The cell, plants and animals, diversity of life, and subdivisions in biology using indexes, journals, biological dictionaries, and personal public relations.

45 AIDS Fundamentals (4) F. Lecture, three hours. Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond. Same as Social Ecology S45.

50 The Biology of Heart Disease (4) S. Lecture, four hours. Guest lecturers from the field of cardiovascular medicine discuss current concepts regarding cause, diagnosis, and treatment of heart disease. Topics include surgery, rehabilitation, and congenital defects, with emphasis on prevention.

78 Health (2) F, S. Lecture, three hours. A practical health education course comprised of lectures by practicing professionals. Health topics covered include stress, physical fitness, cardiovascular disease, cancer, communicable diseases, nutrition, eating disorders, rape prevention, common illness, and trauma and emergency medical care. Pass/Not Pass only.

91 Origin of Life and Biological Evolution (4) S. Lecture, three hours. Origin of life starting with the primordial atmosphere of the earth about four billion years ago. Biological evolution of organisms traced in increasing steps of chemical complexity beginning with the formation of primitive biological molecules. Evolution of immune system, nervous system, and behavior.

Seminars, Special Courses, and Independent Study

Seminars

2 Freshman Seminars (1) F. Lecture, one hour. Weekly seminars conducted under the direction of New Student Peer Academic Advisors. Speakers, including faculty, will provide information about the School of Biological Sciences, campus resources, and special programs. Prerequisite: freshman Biological Sciences majors. Pass/Not Pass only.

190 Transfer Student Seminars (1) F. Lecture, one hour. Weekly seminars conducted under the direction of New Student Peer Academic Advisors. Speakers, including faculty, will provide information about the School of Biological Sciences, campus resources, and special programs. Open only to new transfer students. Pass/Not Pass only.

Special Courses

98 Special Group Activities F, W, S.

Sec. 1A Health Sciences Experience, Medicine, and Allied Health (0). Opportunities to observe or participate in various health fields. Specific number of hours per quarter of volunteer work with approved health professionals required. Passing contingent on completion of minimum specified hours with satisfactory evaluation. Some agencies require a two-quarter commitment. Fields include optometry, veterinary and human medicine, and allied health. Pass/Not Pass only.

Sec. 1B Health Sciences Experience, Dentistry (0). Description same as Sec. 1A. Pass/Not Pass only.

Sec. 2 Tutoring in Biological Sciences (2 to 4). Students act as peer tutors and provide tutorial assistance in Biological Sciences Core classes. Prerequisite: consent of instructor. May be repeated for a total of eight units. Pass/Not Pass only.

Sec. 3 Reading, Writing, and Reasoning for Health Science Majors (0). Strategies and practice to strengthen critical reading, writing, and reasoning skills in preparation for the new Medical College Admission Test (MCAT), the Dental Admissions Test (DAT), the Optometry Aptitude Test (OAT) as well as graduate-level course work. Pass/Not Pass only. Prerequisite: consent of instructor.

Sec. 5 Curriculum (2). Initiation, planning, and coordination of student-run courses. Prerequisite: consent of instructor. May be repeated for a total of eight units. Pass/Not Pass only.

Independent Study

Information on independent-study credit limitations is available on page 65.

197A-B-C Special Study in Biological Sciences (1 to 4 per quarter) F, W, S. Tutorial, one to four hours. Library research, tutorial, and other independent projects under individual professors. Individualized instruction dealing with conceptual or theoretical problems in the biological sciences, rather than technical problems. Regularly scheduled meetings between student and faculty member and successful completion of a written report. Prerequisite: consent of instructor. An abstract form must be filed in the Biological Sciences Student Affairs Office. May be graded "IP." May be repeated for credit.

199A-B-C Independent Study in Biological Sciences Research (1 to 5 per quarter) F, W, S. Individual experimental laboratory or field research under a professor's direction. Required for participation in the Excellence in Research Program. Further information and a booklet describing many prospective projects are available in the Biological Sciences Student Affairs Office. Prerequisite: consent of instructor. An abstract form must be filed in the Biological Sciences Student Affairs Office. May be graded "IP." May be repeated for credit.

Core Curriculum

Biological Sciences courses numbered 90, 101, 102, 103, 103L, 104, 104L, 105, 105L, 106, 106L, and 107 are required of all Biological Sciences majors. (See Concentration in Ecology and Environmental Biology for exceptions.) Lecture, three hours; laboratory, three hours unless otherwise noted. (Transfer students who have successfully completed one or more years of college biology should consult with the Biological Sciences Student Affairs Office for possible exemption from portions of the Core.)

90 Diversity of Life (5) F, W, S. Lecture, three hours; laboratory, four hours. Types of living organisms with an introduction to systematics and classification. Evolutionary aspects are stressed.

101 General and Evolutionary Genetics (4) F. Lecture. Introduction to genetics and the genetics of populations. Basic features of the replication and expression of DNA; cell division; and gene transmission. Recombination and mutation in diploid organisms. Concepts of genetic variability and natural selection in populations. Prerequisites: Biological Sciences 90 and concurrent enrollment in or completion of Chemistry 1A-B-C. Formerly Biological Sciences 101A.

102 Ecology (4) W. Lecture. Ecological principles and their relevance at several levels of organization. Individuals, populations, communities, and ecosystems and interactions of these levels with physical and biotic environments. Prerequisites: Biological Sciences 90 and 101. Formerly Biological Sciences 101E.

103 Developmental and Cell Biology (4) S. Lecture. Basic concepts of cell and developmental biology. Emphasis on structure of the cell and its components, and development of structure during embryology of plants and animals. Prerequisite: Biological Sciences 101. Formerly Biological Sciences 101B. Corequisite: Biological Sciences 103L.

103L Developmental and Cell Biology Laboratory (2) S. Corequisite: Biological Sciences 103. Formerly Biological Sciences 101LB.

104 Physiology (5) F, W. Lecture, four hours. Major functional features of plants and animals relevant to their survival. Focus on the whole organism and its constituent organs and organ systems; functional attributes of cells introduced as required. Discussion of neurophysiology and behavior deferred to Biological Sciences 105. Prerequisite: Biological Sciences 103. Formerly Biological Sciences 101C. Corequisite: Biological Sciences 104L.

104L Physiology Laboratory (2) F, W. Corequisite: Biological Sciences 104. Formerly Biological Sciences 101LC.

105 Psychobiology (4) F, S. Lecture. Evolution of behavior, including ethological and psychological aspects and analysis of neuroanatomical, neurochemical, neurophysiological, and neuroendocrine systems underlying basic behavioral processes. Prerequisite: Biological Sciences 104. Formerly Biological Sciences 101D.

105L Psychobiology Laboratory (3) F, S. Prerequisite: Completion of or concurrent enrollment in Biological Sciences 105. Formerly Biological Sciences 101LD.

NOTE: 106 Biochemistry and 107 Molecular Biology form a continuous sequence covering modern biochemistry and molecular biology.

106 Biochemistry (4) F, S. Lecture. Structure and properties of proteins; major biochemical pathways and mechanisms for their control. Prerequisite: completion of or concurrent enrollment in Chemistry 51B. Formerly Biological Sciences 101F.

106L Biochemistry Laboratory (3) W, S. Properties of enzymes and the culture and isolation of mutants of microorganisms. Prerequisite: concurrent enrollment in or completion of Biological Sciences 106. Formerly Biological Sciences 101LF.

107 Molecular Biology (4) W, S. Lecture. Biochemistry and replication of nucleic acids; molecular genetics; protein biosynthesis; genetic code; regulation of expression of genetic information; biochemical evolution. Prerequisite: Biological Sciences 106. Formerly Biological Sciences 101G.

Satellite Courses

108 Behavioral Neuroscience Theory and Methods (4) W. Lecture, three hours. Study of the nervous system and how behavior is mediated. Investigation of the neural mechanisms underlying both simple and complex aspects of behavior.

118 Microbial Ecology of Natural and Polluted Waters (4) S. Lecture, three hours. Microorganisms and their functions in the aquatic environment, specifically their role in biogeochemical cycles of nitrogen, sulfur, and mercury, and how man's activities affect these cycles. How and why indicator organisms are used in the determination of water quality for public health. Prerequisite: a general course in biology or Social Ecology E5. Same as Social Ecology E125.

118L Microbial Ecology of Natural and Polluted Waters Laboratory (4) S. Laboratory, six hours. Enumeration and identification of microorganisms from various aquatic environments. Microbial mediation of sulfur, nitrogen, and mercury cycles. Public health aspects of water quality. Corequisite: Biological Sciences 118. Same as Social Ecology E125L.

119 The Chemical Components of Water Quality (4) F. Lecture, three hours; laboratory, three hours. Chemical properties of water used for drinking, agriculture, and industry. Basic chemical analyses of water and significance of these tests in determining water quality. Prerequisites: Chemistry 1A and Social Ecology E5. Same as Social Ecology E140.

120 Quantitative Ecology (4) W. Lecture, three hours; discussion, one hour. Analysis and survey of quantitative ecological models: population growth and regulation, predation, competition, community composition, sociobiology, optimality theory, and similar topics. Interactive computer tutorials with graphics. Prerequisites: Biological Sciences 102 and Mathematics 2A-B.

121 Immunology with Hematology (4) W. Lecture, three hours; discussion, two hours. Antibodies, antigens, antigen-antibody reactions, cells and tissues of lymphoreticular and hematopoietic systems, and individual and collective components of cell-mediated and humoral immune response. Prerequisite: Biological Sciences 106 or consent of instructor.

122 General Microbiology (4) F, Summer. Lecture, three hours; discussion, one hour. Comparative metabolism of small molecules and cell structure and relationship to microbial classification. Macromolecule synthesis and regulation, sporulation, cell division, growth, and effect of antibiotics. Prerequisite: Biological Sciences 106.

122L General Microbiology Laboratory (4) F, Summer. Laboratory, nine hours. Selective isolation of wide variety of microbial types. Characterization and identification by morphological and comparative nutritional and biochemical approaches. Industrial, medical, and biological research applications. Prerequisites: concurrent enrollment in Biological Sciences 122 and consent of instructor.

123 Computer Applications in Molecular Biology (3) S. Laboratory, three hours. The use of computer programs in molecular biology. Beginning from DNA sequence data, students will enter and construct a data base, analyze the sequence data, and predict some of the structural features of proteins. A familiarity with personal computers is desirable but not required. Prerequisite: Biological Sciences 107 and consent of instructor.

124 Virology (4) F. Lecture, three hours. Infective cycle, growth, reproduction, and host interrelationships of animal viruses. Molecular effects of virus infection in cells and animals and the relation between virus infection and cancer. Prerequisite: Biological Sciences 106.

125 Molecular Biology of Transformed Animal Cells (4) S. Lecture, three hours. Molecular mechanisms of carcinogenesis. Consideration of transformation by DNA tumor viruses, RNA tumor viruses, and chemical carcinogens. Prerequisite: concurrent enrollment in Biological Sciences 107 or consent of instructor.

126 Bacterial Physiology (4) S. Lecture, three hours. Includes basic concepts of bacterial physiology with emphasis on the biochemical mechanisms of carbon, nitrogen, sulfur, and energy metabolism and how bacteria function as geochemical agents. Prerequisite: Biological Sciences 106.

127 Pathogenic Microbiology (4) W. Lecture, three hours. Disease-causing microorganisms including bacteria, fungi, and viruses explored in light of their ability to cause disease. Nature of host-parasite relationship and role of immunity in the pathogenesis of infectious diseases. Prerequisite: Biological Sciences 122 or consent of instructor.

128 Genetic Engineering (4) S. Lecture, three hours. Basic biochemical and molecular biology of restriction endonucleases. Vectors for recombinant DNA. Cloning of genes. Sequence analysis of genes. Prerequisite: Biological Sciences 106; Biological Sciences 107 recommended.

129 Biotechnology and Plant Breeding (4) F, Summer. Lecture, three hours. Synopsis of conventional plant breeding techniques, their limitations, and supplementations through modern biotechnology. These new biotechnological methods include steps such as cloning, cell transformation (genetic engineering), and cell fusion. Focuses on crop improvement, the state of the art in animal and human systems, and the impact of gene technology on society. Prerequisites: Biological Sciences 90, 91, or consent of instructor.

129L Plant Cell Culture Laboratory (4) W. Laboratory, 60 hours per quarter, run on two, full three-day weekend sessions which normally will not conflict with other classes. Isolation and culture of plant cells and tissues, i.e., protoplasts, pollen, meristem. Genetics and structural manipulation of cultured cells, i.e., fusion, laser microsurgery, mutation. Regeneration of plants from cultured cells and tissues. Greenhouse experience (propagation, fertilization, grafting). Prerequisite: Biological Sciences 129 or consent of instructor.

133 Sensory Physiology (4) S of even years. Lecture, three hours. Physiology and function of sense organs. Emphasis on transduction at the cellular level. Prerequisite: consent of instructor.

134 Plant Physiology (4) S. Lecture, three hours. Plant hormones, growth and development, metabolism, mineral nutrition, and photosynthesis. Prerequisite: Biological Sciences 1E or consent of instructor.

135 Biology of an Organism: Hydra (4-4) S of even years. Lecture, three hours. Some basic concepts of biology through study of the life history of the simple freshwater hydra. Reading material consists mostly of research and review articles. Prerequisites: Biological Sciences 103 and consent of instructor.

136 Developmental Biology (4) W. Lecture, three hours. Development of animal and plant cells, tissues, and organisms. Reproduction, growth, aging, differentiation, and pattern formation. Prerequisite: Biological Sciences 103 or consent of instructor.

137 Genetics

137A Genetics of Bacteria and Viruses (4) F. Lecture, four hours. Prerequisite: Biological Sciences 104.

137B Eucaryotic Genetics (4) W. Lecture, four hours. Basic genetics of animals, plants, and humans. Transmission genetics, chromosome behavior, and molecular genetics unique to higher organisms. Prerequisite: Biological Sciences 104. Recommended: concurrent enrollment in Biological Sciences 137LB.

137LB Eucaryotic Genetics Laboratory (4) W. Laboratory, four hours. Experiments include generation and analysis of chemical- and x-ray-induced mutation, gynadromorphmapping, clonal analysis of mitotic crossing-over, chromosome analysis, and restriction mapping of recombinant DNA clones. Recommended: concurrent enrollment in Biological Sciences 137B.

137C Human Genetics (4) S. Lecture, three hours. The structure, function, transmission, and evolution of human genes and chromosomes and the biological basis of normal and abnormal variation in the human population. Prerequisite: Biological Sciences 101.

138 Comparative Animal Physiology (4) W of even years. Lecture, three hours. Maintenance aspects of physiology: water balance; feeding and digestion; metabolism; respiration and circulation. Prerequisite: Biological Sciences 104.

138L Comparative Animal Physiology Laboratory (2) W of even years. Laboratory, three hours. Prerequisite: concurrent enrollment in or completion of Biological Sciences 138.

141 Biology of Plant and Natural Environmental Toxins (4) W of even years. Lecture, three hours. Introduction to natural toxins produced by fungi, plants, and bacteria that poison food, water and air; the biological effects of toxins on organelles and whole organs and their mode of entry and action; current environmental toxicological issues. Prerequisite: Biological Sciences 103 and Chemistry 51A.

143 Human Parasitology (4) S. Lecture, three hours. Introduction to human-animal parasitic diseases including worm and protozoan infections. Prerequisite: Biological Sciences 104 or consent of instructor.

144 Cell Biology. Taught jointly by faculty from the Departments of Developmental and Cell Biology and Molecular Biology and Biochemistry. Designed to present fundamental as well as advanced concepts in modern molecular cell biology.

144A Cell Organelles and Membranes (4) F. Lecture, three hours. Structure, function, and biogenesis of biological membranes and membrane-bound organelles; protein trafficking and transmembrane signalling. Prerequisite: Biological Sciences 103.

144B Cell Biology (4) W. Lecture, four hours. Plasma membrane and cytoskeletal-mediated events. Topics include: endocytosis, receptor-ligand interactions, the biochemical basis of growth control, cell structure and motility, and cell-cell, cell matrix interactions. The biochemistry and molecular aspects of these topics are emphasized. Prerequisite: Biological Sciences 103.

146 Mathematical Models of Biological Systems (4) S. Lecture, three hours. An introduction to the use of mathematical and computational models of biological systems. Examples drawn from enzyme and receptor kinetics, population dynamics, cellular neurobiology, and epidemiology. Laboratory exercises provide familiarity with mathematical structures and the effects of parameter variation. Prerequisites: Biology core, math through calculus, and consent of instructor.

147 Growth and Development of Plants (4) W. Lecture, three hours. Plant growth and development at the organismic, cellular, and molecular levels. Subjects include plant reproduction and embryology; morphogenesis of plant meristems; cell differentiation; and differentiation gene expression, genetic transformation, and somatic cell genetics. Prerequisite: Biological Sciences 103.

148 Vertebrate Embryology (4) S. Lecture, three hours. Introduction to animal development through organogenesis with emphasis on vertebrates. Prerequisite: Biological Sciences 103.

148L Vertebrate Embryology Laboratory (3) S. Laboratory, four hours. Introduction to the principles of descriptive and experimental embryology. Students develop a spatial and temporal appreciation of

cellular morphogenesis by reconstructing serially sectioned embryonic materials (frog, chick, and pig). Prerequisite: Biological Sciences 148.

149 Development of the Nervous System (4) W. Lecture, three hours. Neurogenesis, cell migration, and environmental interactions from embryogenesis to late maturation with emphasis on vertebrates. Prerequisite: Biological Sciences 105.

150 Conservation Biology (3) S of even years. Lecture, three hours. Considers conservation of animal and plant endangered species. Examines current trends in deforestation, environmental degradation, natural and induced extinctions, principles of preserve design and management, legislation, conservation genetics and *ex situ* methods of conservation. Prerequisites: Biological Sciences 90 and 101.

151 Structure and Function of Eucaryotic Chromosomes (4) S. Lecture, three hours. Molecular organization of chromosomes, comparisons of active vs. inactive chromatin structure, current research in chromosome function and its regulation, with emphasis on techniques utilized to probe these problems. Prerequisite: Biological Sciences 107.

152 Neural Mechanisms of Learning (4). Lecture, three hours. Neural mechanisms and processes underlying learning, ranging from habituation in simple neuronal systems through neural processes of learning in the intact mammalian brain to brain substrates of human information processing and language. Prerequisite: Biological Sciences 80 or 105.

153 Chemistry and Pharmacology of Synaptic Transmission (4) S of even years. Lecture and discussion, three hours. Introduction to chemistry and pharmacology of neural tissue with emphasis on the regulation of neurotransmitter synthesis. Prerequisite: Biological Sciences 105 or consent of instructor.

154 Molecular Biology of the Neurotransmitter Receptor (4) S of even years. Seminar, three hours. Introduction to current research development in molecular biology of the receptor, including receptor biosynthesis, gene cloning, and neural control of gene expression. Prerequisite: Biological Sciences 107 and consent of instructor.

155 Seminar in Psychobiology (4) F. Seminar, three hours. Selected current research problems concerning neurobiology and behavior. Students prepare and present papers. Prerequisites: Biological Sciences 80-81 or 105 and consent of instructor.

156 Neural Systems (4) W of even years. Lecture, three hours. How modern neuroscience integrates several types of disciplines such as anatomy, physiology, developmental biology, and behavioral biology to develop hypotheses about the operation of particular brain regions. Most useful to students who have had satellite courses or research experience in neurophysiology or neurochemistry. Prerequisite: Biological Sciences 105.

157 Comparative Vertebrate Anatomy (6) W of even years. Lecture, three hours; laboratory, six hours. Structure and evolution of the major organ systems in vertebrates, from fish to mammals. Laboratory work includes detailed dissection of a shark and cat. Prerequisite: Biological Sciences 103 or 104.

158 Learning and Memory (4). Lecture and discussion, three hours. Basic issues concerning the nature of behavioral plasticity and information storage and their neural substrates. Prerequisite: Biological Sciences 105 or consent of instructor. Same as Social Sciences 153D.

159 Animal Behavior (4) S. Lecture, three hours. A survey of the proximate and ultimate causations of species-typic behavior. The role of neural and endocrine control of behaviors is stressed. Prerequisite: Biological Sciences 105 or consent of instructor.

160 Language and the Brain (4). Lecture, three hours. Analysis of current research on the biological bases of human linguistic capacity. Topics include development, focusing on hemispheric specialization and plasticity; the localization of specific linguistic functions in adults, with an emphasis on the study of aphasia; the relation of linguistic capacity to general cognitive capacity, considering especially research on retardation. Prerequisite: Biological Sciences 80 and 81 or Biological Sciences 105 or consent of instructor. Same as Social Sciences 142D and Linguistics 144.

161 Cellular Neurobiology (4) S of even years. Lecture and discussion, three hours. Introduction to biophysics and biochemistry of nerve cells emphasizing membrane potentials, conduction and transmission, synaptic chemistry, and information processing. Prerequisite: Biological Sciences 105.

162 Synaptic Mechanisms (4) S of odd years. Lecture and discussion, three hours. New concepts and current literature in developing areas of synapse function. Prerequisite: Biological Sciences 105 or consent of instructor.

163 Psychoneuroendocrinology (4) F of even years. Lecture and discussion, three hours. Introduction to materials showing that hormones are involved in neural development and mature function and behavior and that behavior is involved in the control of hormonal secretions. Prerequisite: Biological Sciences 105.

164 Neuroanatomy (4) S of odd years. Lecture and discussion, three hours. Introduction to comparative neuroanatomy, emphasizing mammalian central nervous system. Prerequisite: Biological Sciences 105.

165 Theoretical Psychobiology (4) S of even years. Lecture, three hours. The origin, development, and current status of major ideas and theories concerning the neurobiological bases of behavioral adaptation. Prerequisite: Biological Sciences 105 or Biological Sciences 80.

166 Field Methods in Ecology (4) F. Lecture, one hour; laboratory, six hours; field trip. Introduction to materials and methods techniques and statistical treatment. Emphasis on field studies with effort equally divided between plant and animal ecology in marine, freshwater, and terrestrial habitats. Requires outdoor-type durable clothing and footwear. Four papers are required, written in the style of a scientific journal. One weekend camping trip is required. (I) Prerequisites: Biological Sciences 90 and completion of or concurrent enrollment in 102; consent of instructor.

168 Advanced Evolutionary Biology (4) S. Lecture, three hours. An examination of the major mechanisms of evolution. Topics include population and quantitative genetics theory, genetic basis of adaptation, the neural theory of evolution, the evolution of sex, life-history evolution, coevolution, speciation, and mass extinctions. Prerequisite: Biological Sciences 101.

169 Marine Ecology (4) F. Lecture, three hours. Fundamental concepts of marine ecology. Physical and chemical factors, current systems and water masses, trophic ecology, distributions of organisms, survey of pelagic and benthic communities. Prerequisite: Biological Sciences 102.

170 Vertebrate Structure and Function (4) S of even years. An introduction to advanced topics in vertebrate biology. Presentation of specific case studies to demonstrate general principles of vertebrate morphology, function, and evolution. Case studies include: the origin and functional morphology of bird flight; mechanics of terrestrial locomotion; structure and function of the vertebrate skull. Prerequisite: Biological Sciences 104 or 157.

171 Neurobiology of Transmitter Receptors (4) W. Lecture and seminar, three hours. Introduction to the use of frog oocytes as a model system for studies in neurobiology. Transplantation of neurotransmitter receptors and voltage-operated ion channels from the brain into oocytes. Prerequisites: Biological Sciences 105 or 107 and consent of instructor.

172 Systematics and Evolution of Flowering Plants (4) S of even years. Lecture, three hours; laboratory, three hours, two required field trips. Basic systematic concepts including computer analysis of phylogenies, introduction to major groups of flowering plants, analysis of evolutionary significance of characters used in systematic studies. Prerequisites: Biological Sciences 90, 101, and 103.

173 Physiological Animal Ecology (4) S of odd years. Lecture, three hours; field, three hours. An examination of the functional means by which vertebrates cope with their environments; roles of osmoregulation, thermoregulation, and energy metabolism in the lives of tetrapods. Prerequisites: Biological Sciences 102 and consent of instructor.

174 Behavioral Ecology (4) F. Lecture, three hours; laboratory, two hours. Animal behavior as an evolutionary solution to problems encountered during an animal's life cycle. Includes a broad comparative approach to communication, social behavior, habitat selection,

and food finding. Prerequisite: Biological Sciences 102 or consent of instructor.

179 Limnology and Freshwater Biology (4) W. Lecture, three hours; discussion, one hour. Biology of freshwater environments: lakes, ponds, rivers, their biota, and the factors which influence distribution of organisms. Prerequisite: Biological Sciences 102 or consent of instructor.

186 Population and Community Ecology (4) W. Lecture, three hours. Population structure, function, development, and evolution. Topics include population age structure, population growth and regulation, population dispersion patterns, life history strategies, predation, competition, symbiosis, species diversity, niche theory, succession, island biogeography, and co-evolution. Prerequisite: Biological Sciences 102.

187 Natural History of the Vertebrates (6) S of even years. Lecture, three hours; laboratory, three hours; field work. The phylogeny of the vertebrates and their adaptations to the environment, with laboratory and field identification of local amphibians, reptiles, birds, and mammals. Prerequisite: Biological Sciences 102 or consent of instructor.

188 Introduction to Insect Physiology (4) W of odd years. Lecture, three hours. Physiology of insects. Insect respiration, digestion, excretion, and neurobiology, including sensory systems and effectors. Prerequisite: Biological Sciences 102 or 103.

192 Comparative Animal Histology (4) S of even years. Lecture, two hours; laboratory, three hours. Cell organization within tissue, tissue structure related to tissue function, organization of similar tissues in different animal phyla analyzed at the level of light microscopy. Prerequisite: Biological Sciences 104 or equivalent knowledge of cell structure and animal anatomy.

Graduate Study in the School of Biological Sciences

Graduate student status or consent of instructor is a prerequisite for all 200-299 courses listed in the following departmental sections.

Department of Developmental and Cell Biology

Faculty

Joseph Arditti: Plant physiology and development; orchid and taro biology

Michael W. Berns: Experimental cytology; laser microbeams; laser medicine

Hans R. Bode: Cell differentiation and pattern formation

Marianne E. Bronner-Fraser: Mechanisms of cell migration and differentiation; cell surface-extracellular matrix interactions; morphogenesis; teratogenesis and abnormal development; neurotransmitter synthesis and plasticity

Peter J. Bryant: Control of growth in animal development

Susan V. Bryant: Vertebrate limb development and regeneration

Frank J. Knauer: Molecular mechanisms of development

Richard D. Campbell: Developmental biology of multicellular organisms

Donald E. Fosket: Cell growth and development

Patrick L. Healey: Plant cellular differentiation and morphogenesis; ultrastructure and histochemistry of secretory systems; early reproductive development

Franz Hoffmann: Plant somatic cell genetics and plant cell biology

Daniel J. Knauer: Mammalian cellular biochemistry; role of extracellular proteases and inhibitors in development

Stuart M. Krassner: Parasite immunology and biochemistry

Howard M. Lenhoff: Biology of *Hydra*; immobilized enzymes; history of experimental biology

J. Lawrence Marsh: Molecular genetics of development and gene regulation

Ronald L. Meyer: Developmental neurobiology

R. Michael Mulligan: Plant molecular and cell biology

Ben A. Murray: Molecular, cellular and developmental biology of vertebrate cell surface molecules

Eloy Rodriguez: Cellular metabolism and biochemistry of bioactive and toxic metabolites in plant cell cultures and tissues
 Howard A. Schneiderman: Developmental biology and insect physiology
 L. Dennis Smith: Molecular biology of oogenesis and early development; nucleocytoplasmic interactions

The Department of Developmental and Cell Biology is concerned with the development, physiology, structure, and function of organisms and their component cells. The main emphasis of the Developmental and Cell Biology graduate program is research training in developmental biology, comparative physiology of animals, or cellular and developmental plant biology. The Department maintains facilities for research involving biochemistry; genetics; electron microscopy; cell, tissue, and organism culture; microsurgery; and neurophysiology.

Students in the Department of Developmental and Cell Biology generally enter one of three graduate curricula. In the first year, those emphasizing comparative physiology take a three-quarter sequence of organismic physiology (Developmental and Cell Biology 210). Those emphasizing developmental biology take a three-quarter sequence of courses on molecular and cellular biology during the first year, followed by a total of five advanced courses during the subsequent years. Those emphasizing cell biology take a three-quarter series of core courses focused on cell biology as well as courses in protein and nucleic acid biochemistry. The selection of the first-year course program is made in consultation with a faculty advisory committee when the student first arrives on the campus. This committee monitors the student's progress through the first year after which the student's thesis committee is established and takes over the advising function. Students are able to diverge from this basic core into their areas of special interest by means of graduate seminar courses in subsequent years. At the end of the first year students in comparative physiology and cellular and developmental plant biology take an oral examination that covers a broad area in the general and related fields of interest to that student. Students in developmental and cell biology prepare and defend a research proposal and are examined in fields related to the proposal. Since many doctoral students in the Department undertake academic careers, the Department requires each graduate student to participate in a directed teaching experience during each year of the graduate program. Students who enter with normal academic preparation and pursue a full-time program of study ordinarily should be able to earn the Ph.D. degree within five years or less.

Some faculty from the Department are members of an interdisciplinary biophysics and biophysical chemistry group. See page 95 for a description of the program.

Courses in Developmental and Cell Biology

200A-B-C Research in Developmental and Cell Biology (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor.

201A-B-C Developmental and Cell Biology Journal Club (2-2-2) F, W, S. Seminar, two hours. Advanced study in various fields of organismic biology. Prerequisite: consent of instructor. May be repeated for credit.

203A-B-C Graduate Tutorial in Developmental and Cell Biology (4-4-4) F, W, S. Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

204 Mammalian Regeneration Journal Club (2-2-2) F, W, S. Seminar, one hour. Discussion of recent papers in the area of

mammalian regeneration, covering such systems as the nervous system, muscles, limbs. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only.

205 Microscopy and Photography (2) F of odd years. Lecture, two hours. Major techniques and instrumentation related to light microscopy and scientific photography. Course is practical in its aim. Students carry out projects using methods introduced. Prerequisite: completion of or concurrent enrollment in any laboratory research course.

206A-B-C Cell Biology Journal Club (2-2-2) F, W, S. Seminar, one hour. Advanced study of various topics in cell biology. Prerequisite: consent of instructor. May be repeated for credit. Satisfactory/Unsatisfactory only.

207 Techniques for Instruction: Biology 104L (1) F. Laboratory, two hours. A training course required of graduate students serving as teaching assistants in Biology 104L (Physiology). Prerequisite: graduate enrollment in the Biological Sciences and assignment as a teaching assistant in Biology 104L. Satisfactory/Unsatisfactory only.

208 Plant Cell and Molecular Biology Journal Club (2-2-2) F, W, S. Seminar, two hours. Advanced study in various topics of plant cell and molecular biology. Prerequisite: consent of instructor. May be repeated for credit. Satisfactory/Unsatisfactory only.

209 Molecular Genetics Journal Club (2-2-2) F, W, S, Summer. Seminar, one and one-half hours. Advanced topics of current interest in molecular and developmental genetics. May be repeated for credit. Satisfactory/Unsatisfactory only.

210A-B-C Foundations of Physiology (4-4-4) F, W, S. Lecture and discussion, four to eight hours. Physical and functional principles common to many living forms stressed. Course forms a basis for subsequent specialization in any of the subdisciplines of physiology. May be repeated for credit. Satisfactory/Unsatisfactory only.

230 Cell Biology (4) S. Lecture, three hours. The third of a three-course sequence in graduate-level cell biology (first is Microbiology and Molecular Genetics 213; second is Molecular Biology and Biochemistry 206). Emphasis is on the biochemistry of cellular processes and the relationship between subcellular organization and function. Prerequisite: consent of instructor.

231A-B-C Developmental Biology (4-4-4) F, W, S. Lecture, two hours; discussion, one hour. Graduate core course in developmental biology. Prerequisite: consent of instructor. May be repeated for credit once.

233 Cell Surface Biology (4-4) S of even years. Lecture, three hours. Modern concepts of cell surface organization and dynamics as well as cell-cell, cell-matrix, and hormone-cell interactions of normal and pathologic cells and tissues. Prerequisite: consent of instructor.

236 Toxins and Cellular Injury (4) W of odd years beginning 1991. In-depth examination of potent toxins of animal, microbial, and plant origin that are responsible for cell damage in animals and plants. Mechanisms of cellular toxicity, with focus on the nucleus (nucleic acids), microtubules, mitochondria, and chloroplasts. Same as Environmental Toxicology 205.

240A-B-C Modeling of Developmental Processes (2 to 4 per quarter) F, W, S. Lecture, one hour; seminar, two hours. Mathematical, logical, and computational methods for modeling developmental processes. Prerequisite: consent of instructor. May be repeated for credit.

245 Advanced Plant Biology (4) F. Lecture, four hours. Graduate course in botany; recent concepts of major areas of plant biology. Prerequisite: consent of instructor. May be repeated for credit once.

247 Insect Reproduction (4) F of every third year beginning fall 1985. Lecture, four hours. Discussion of latest research on gametogenesis, fertilization, parthenogenesis, and early development of insects, with emphasis on genetic aspects in *Drosophila*. Prerequisite: consent of instructor. Open to senior undergraduate students with consent.

248 Insect Embryology (4) F of every third year beginning fall 1986. Lecture, four hours. Analysis of the embryonic development of insects integrating molecular, genetic, and classical approaches. Emphasis is placed on the most recent findings from *Drosophila* molecular genetics. Prerequisite: consent of instructor. Open to senior undergraduate students with consent.

249 Insect Development (4) F of every third year beginning fall 1984. Lecture, four hours. Postembryonic development of insects studied by classical methods as well as by genetic methods in *Drosophila*. Emphasis placed on studies of pattern formation in imaginal discs and regenerating appendages, on the development of the nervous system, and on the endocrine control of development. Prerequisite: consent of instructor. Open to senior undergraduate students with consent.

250 Limb Development (4) F. Explores vertebrate limb development, regeneration, and evolution through directed reading of pertinent current literature concerning both experiment and theory.

251 Developmental Neurobiology (4) S of odd years. Lecture, two hours; discussion, one hour. Developmental biology of the nervous system of vertebrates and invertebrates with emphasis on the cellular events underlying differentiation, morphogenesis, synaptic connectivity, and electrochemical activity. Prerequisite: consent of instructor. May be repeated for credit.

253 Plant Cell Differentiation (4) W of odd years. Lecture, three hours. The cellular and molecular basis of plant cell differentiation. Different areas covered each quarter. Over the course of several years will discuss hormone action, seed protein synthesis and decomposition, cell wall deposition, nitrogen fixation, and chloroplast differentiation. May be repeated for credit.

254 Practical Electron Microscopy (5) W. Laboratory, four hours. Methods of electron microscopy including sample preparation, fixation, embedding, sectioning, staining, EM examination, EM photography, developing, printing, and data analysis. In addition, participants learn to use more than one type of EM including alignment, perform routine EM procedures, and use specialized EM accessory equipment such as an ultramicrotome, vacuum evaporator, and critical point dryer. Prerequisite: consent of instructor.

255 Plant Morphogenesis (4) W of even years. Lecture, three hours. Examination of current problems in plant differentiation and its control, primarily at the tissue and whole plant level. A single major topic will be selected each year and will include such subjects as control of morphogenesis in shoot and root apices, flowering, control of cambial growth, pattern formation, plant embryology, and control of the formation of plant organs in culture. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

265 Parasitology (4) F, W, S. Seminar, one hour. Topics vary from year to year. Prerequisite: consent of instructor.

285 Advanced Topics in Cell Biology (2) F, W, S. Lecture, two hours. Seminars, lectures, and informal discussions by invited speakers, graduate students, and faculty. Topics vary. Major emphasis in the areas of plant physiology, development, and biochemistry. Required for all graduate students working toward an advanced degree in the area of plant biology in Developmental and Cell Biology. Prerequisite: consent of instructor. May be repeated for credit.

290A-B-C Colloquium in Developmental and Cell Biology (2-2-2) F, W, S. Colloquium, one and one-half hours. Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics. Satisfactory/Unsatisfactory only.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants. Satisfactory/Unsatisfactory only.

Department of Ecology and Evolutionary Biology

Faculty

Richard E. MacMillen, *Department Chair*: Physiological animal ecology

Mark C. Andersen: Plant-herbivore interactions; quantitative ecology

Peter R. Atsatt: Plant ecology and evolution

Francisco J. Ayala: Population and evolutionary genetics

Albert F. Bennett: Environmental physiology; physiological ecology

Timothy J. Bradley: Comparative physiology of ion transport epithelia

F. Lynn Carpenter: Community ecology; behavioral ecology

Peter S. Dixon: Phycology

Steven A. Frank: Social behavior and evolutionary genetics

Richard R. Hudson: Theoretical population genetics, molecular genetics, and DNA variation within populations

George L. Hunt, Jr.: Behavioral ecology, marine ornithology

Robert K. Josephson: Comparative neurophysiology; muscle physiology

Harold Koopowitz: Comparative neurophysiology; conservation of endangered plant species

George V. Lauder, Jr.: Functional vertebrate morphology

Richard E. Lenski: Coevolutionary biology; microbial ecology

Laurence D. Mueller: Theoretical and empirical studies of density-dependent natural selection

Eloy Rodriguez: Chemical ecology of plant-animal interactions; evolution and function of natural products in desert plants

Michael R. Rose: Evolution of life histories and genetic systems

Grover C. Stephens: Comparative animal physiology

Arthur E. Weis: Evolutionary ecology of plant-insect interactions; plant population biology

Stephen G. Weller: Plant reproductive ecology; plant population ecology

Ecology and evolutionary biology deals with the establishment of adaptations over evolutionary time and with the significance of these adaptations in ecological time. The Department of Ecology and Evolutionary Biology focuses on problems at the population and community levels, with particular emphasis placed on coevolved processes. While the Department has faculty specialists in plant and animal ecology and in marine and terrestrial ecology, primary attention is given to important ecological questions rather than to particular habitats or taxa. Faculty and graduate student research is often centered at the interface of two or more of these specialties. Departmental research activities include ecological energetics, plant-herbivore and plant-pollinator interactions, microbial ecology and coevolution, quantitative genetics, life history evolution, population and reproductive ecology, and community ecology. These research endeavors attempt to achieve a balance between empirical and theoretical approaches to evolutionary and ecological problems.

Primary emphasis in the Department graduate program is placed on training leading to the Ph.D. in Biological Sciences; under exceptional circumstances, a student may be admitted initially to the M.S. program. All entering students are required to enroll during the first year in a three-quarter graduate core sequence. At the end of the first year, these students complete an oral examination based upon the core courses and other materials the Department might require. Satisfactory performance on this examination is required for continuation in the graduate program.

Each entering graduate student is assigned a faculty advisor and a three-person advisory committee for guidance, with whom the student meets at least once each quarter. All students are encouraged to submit a research proposal to their advisory committee during their first year of residency. A comprehensive proposal is required before the end of the second year. The progress of each student is reviewed by the departmental faculty before the end of each academic year.

Normally, all requirements for the Ph.D. should be completed within five years. No more than six years will be allowed for completion of the program. Prior to advancement to candidacy for the Ph.D., students must satisfy two breadth requirements at the discretion of their advisory committee. One of these must be satisfied with a foreign language and the second by the attainment of an additional skill equivalent to a second foreign language (i.e., a second foreign language, demonstrated skills in computer-statistics, attainment of unusual technical expertise necessary for dissertation

research, etc.). Advancement to doctoral candidacy by a comprehensive oral examination will be expected during the third year for students entering with a B.A. or B.S. or during the second year for those entering with an M.A. or M.S. Applicants for this program should have a solid undergraduate program in biology and ecology, emphasizing both research and field work. In addition, course work in statistics, mathematics, and physical and chemical sciences is expected. All applicants are required to submit aptitude and advanced biology GRE scores. The deadline for application is February 1.

Courses in Ecology and Evolutionary Biology

200A-B-C Research in Ecology and Evolutionary Biology (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor.

201A-B Seminar in Ecology and Evolutionary Biology (2-2) F, W. One and one-half hours. Invited speakers present current research in ecology and evolutionary biology. Required of all graduate students. May be repeated for credit. Satisfactory/Unsatisfactory only.

202A-B-C Ecology and Evolutionary Biology Research Reviews (1-1-1) F, W, S. Seminar, one hour. Current research by graduate students and faculty. Satisfactory/Unsatisfactory only. Required of all graduate students. May be repeated for credit.

203A-B-C Graduate Tutorial in Ecology and Evolutionary Biology (2 to 12 per quarter) F, W, S. Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition. Prerequisite: consent of instructor.

205 Special Topics in Ecology (4-4) F. Lecture, four hours. Survey of special topics in ecology. Required of all entering graduate students in their first year of residence.

206 Special Topics in Evolution (4-4) W. Lecture, four hours. Extensive introduction to the primary literature of evolutionary biology. Topics include population genetics, quantitative genetics, neutralism, molecular evolution, evolution of genetic systems, genetic architecture of fitness, speciation, and macroevolution. Required of all entering graduate students in their first year of residence.

207 Quantitative Methods in Ecology and Evolutionary Biology (4-4) S. Lecture, four hours. Statistics for ecologists and evolutionary biologists. Emphasis on specific applications and underlying assumptions rather than on methods of calculation. Topics include experimental design, parametric and nonparametric methods, analysis of variance and covariance, and multiple regression. Required of all entering graduate students in their first year of residence. Prerequisite: at least one quarter of statistics, including regression and analysis of variance.

Enrollment in the following courses may be approved for undergraduate students with advanced standing:

220 Seminar in Evolutionary Biology (2-4) F. Seminar, three hours. Topics vary. Prerequisite: graduate enrollment or consent of instructor. May be repeated for credit.

224 Seminar in Vertebrate Biology (2 to 4) S of odd years. Seminar, three hours. Topics arranged are consistent with graduate student interest and center around themes in vertebrate physiological ecology, paleontology, and evolution. Prerequisite: consent of instructor.

227 Seminar in Population/Community Ecology (2 to 4) F of even years. Seminar, three hours. Selected topics in population or community ecology (such as island biogeography, evolution of sex ratios, reproductive biology of marine birds) through discussion of current literature and preparation of papers. Prerequisite: consent of instructor.

229 Seminar in Terrestrial Community Ecology (2 to 4) S of odd years. Seminar, three hours. Modern topics in field and theoretical community ecology. Prerequisite: consent of instructor.

230 Advanced Plant Population Biology (4) S of odd years. Lecture, three hours; discussion, one hour. Characteristic aspects of the population of flowering plants, including sexual and asexual reproduction systems; the effect of sessile nature of plants on gene flow, dispersal, and colonization; and the relationship of life history theory to demographic patterns observed in flowering plants. Prerequisite: consent of instructor.

240 Mathematical Population Biology (2-4) S of even years.

Seminar, three hours. Mathematical modeling of ecological and evolutionary processes is developed with a view toward teaching methods of theoretical research in ecology and evolutionary biology. Prerequisite: consent of instructor.

250 Molecular Evolution (4) W of odd years. Seminar, four hours. Recent advances in the study of evolution at the molecular level. Topics include genetic variation in populations, regulatory versus structural-gene evolution; genetic differentiation between populations and species; reconstruction of phylogenetic history; rates of evolution. Prerequisite: consent of instructor.

274 Behavioral Ecology (4) W of odd years. Seminar, three hours. Selected topics in behavioral ecology through discussion of current literature and preparation of papers. Prerequisite: consent of instructor.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

Department of Molecular Biology and Biochemistry

Faculty

Krishna K. Tewari, *Department Chair*: Chloroplast DNA; replication and transcription

Barbara K. Burgess: Biochemistry and genetics of nitrogen fixation

Michael G. Cumsy: Mitochondrial biogenesis in yeast; expression and targeting of mitochondrial precursor proteins

Rowland H. Davis: Regulation and genetics of lower eucaryotes

Hung Fan: Animal virology, nucleic acid studies in murine leukemia virus

Charles Glabe: Developmental biology; cell-cell interactions

Gale A. Granger: Cellular immunology; molecular immunology

Barbara A. Hamkalo: Structure of chromosomes; regulation of gene expression

Jerry E. Manning: Gene sequence organization, eucaryotic DNA; electron microscopy

Michael B. O'Connor: Developmental biology, gene regulation

Donald Seneear: Regulatory energetics in protein-DNA assemblies

Wendell M. Stanley, Jr.: Physical and biological properties of nucleic acids and proteins

Sujata Tewari: Neuromolecular biology and CNS-acting drugs

Luis P. Villarreal: Animal virology; molecular basis of pathogenesis

Edward K. Wagner: Animal virology, nucleic acid synthesis, and function in infected cells

Robert C. Warner: Molecular biology of nucleic acids; physical chemistry of macromolecules; mechanism of genetic recombination

Clifford A. Woolfolk: General microbiology; enzymology

The Department of Molecular Biology and Biochemistry in the School of Biological Sciences offers graduate study under the administration of the School of Biological Sciences. The curriculum is designed to produce creative and productive scientists who have an in-depth comprehension of modern biochemistry and molecular biology and who are highly competent in a given subspecialty.

The faculty's research interests include structure and synthesis of nucleic acids and proteins, regulation, virology, biochemical genetics, gene organization, and immunology. The first-year student is required to take a core of advanced courses (203, 204, 205, 206, 207, 208, and 209), to become associated with the laboratories of at least three different investigators, and to attend the 201A-B-C seminar series. During the first year, students are advised by members of the graduate committee. Upon successful completion of the first year, the student is given a comprehensive oral examination to test breadth and depth of knowledge. Although further supplemental work may be recommended, the student normally begins a specific research project with a faculty member in the second year. The student, by passing an oral

examination by the end of the third year on the proposed dissertation work, may advance to candidacy for the Ph.D. degree. Students normally complete their degree programs after a total of five years of graduate study. Participation in the seminar series (201A-B-C) and completion of at least one satellite course per year (210-279) for three years are expected of all continuing students. Regular teaching of undergraduates is part of the training of graduate students at all levels. The graduate committee may waive some of the above requirements for candidates for the Master's degree.

Applicants should have adequate undergraduate preparation in calculus, physics, physical chemistry, organic chemistry, and biochemistry. Students who have not had an adequate physical chemistry course are expected to take Chemistry 130A-B-C by the end of the second year.

Some faculty from the Department of Molecular Biology and Biochemistry are members of an interdisciplinary biophysics and biophysical chemistry group. See page 95 for a description of the program.

Courses in Molecular Biology and Biochemistry

200A-B-C Research in Molecular Biology and Biochemistry (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. See areas of interest listed under Faculty. Prerequisite: consent of instructor.

201A-B-C Seminar in Molecular Biology and Biochemistry (2-2-2) F, W, S. Seminar, two hours. Content varies. Presentation of research from departmental laboratories or, when pertinent, of other recent developments. Prerequisite: consent of instructor.

202A-B-C Tutorial in Molecular Biology and Biochemistry (4-4-4) F, W, S. Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs. Prerequisite: consent of instructor.

203 Structure and Biosynthesis of Nucleic Acids (4) F. Lecture, three hours. The structure and properties of nucleic acids. The fundamentals of nucleic acid hybridization and recombinant DNA methodology. Replication and rearrangement of DNA. Prerequisites: Biological Sciences 106 and 107 or the equivalent and Chemistry 51A-B-C or the equivalent. (Coordinator, J. Manning)

204 Structure and Biosynthesis of Proteins (4) F. Lecture, three hours. The structure and properties of proteins. Enzymes and their kinetic properties. Mechanisms of the biosynthesis of proteins. Prerequisites: Biological Sciences 106 and 107 or the equivalent and Chemistry 51A-B-C or the equivalent. (Coordinator, B.K. Burgess)

205 Eucaryotic Gene Expression: Viral and Organelle Genes (4) W. Lecture, three hours. The structure of eucaryotic genes and the role of transcriptional and posttranscriptional processing in their expression. Primary research data on the major DNA and RNA viruses and cellular organelles. Graduate-level knowledge of the biochemistry and molecular biology of macromolecules is required. Prerequisites: Biological Sciences 106 and 107 or the equivalent and Chemistry 51A-B-C or the equivalent. (Coordinator, E. Wagner)

206 Eukaryotic Gene Expression: Chromosomal Genes (4) W. Lecture, three hours. Aspects of gene expression including the organization of the eukaryotic nucleus in terms of protein-nucleic acid interaction (i.e., chromatin and chromosome structure); comparisons between prokaryotic and eukaryotic gene expression, the enzymology and regulation of RNA transcription in *E. coli* and other prokaryotes. Enzymology of transcription in eukaryotes. Prerequisites: Molecular Biology 203, 204, and 205. (Coordinator, B. Hamkalo)

207 Molecular Genetics (4) S. Lecture, three hours. Recombination, genome organization, and gene expression at the molecular level, with emphasis on genetic analysis. Prerequisites: Molecular Biology 203, 204, 205, and 206. (Coordinator, R. Davis)

208 Metabolic Regulation (4) S. Lecture, three hours. A consideration of the molecular mechanisms responsible for the regulation of metabolite flow. Examples are chosen from organisms ranging from

bacteria to mammals and include regulation of enzyme content. Prerequisites: Biological Sciences 106 and 107 or the equivalent and Chemistry 51A-B-C or the equivalent. (Coordinator, S. Arfin)

209 Biochemical Methodology (6) S. Lecture, three hours; laboratory, six hours. Introduction to techniques available to the modern biochemist. Opportunity to experience many of the methods available for the isolation and characterization of molecules of biological interest. Experiences are provided in the context of a problem or problems in modern molecular biology, emphasizing the principles behind techniques employed. Prerequisite: consent of instructor. (Coordinator, K. Tewari)

210A-B Basic Medical Biochemistry (10-10) F, W. Lecture, ten hours. Classical and molecular biochemistry, including structure, function, and biosynthesis of macromolecules; metabolic interrelations and control mechanisms; and biochemical genetics. Application of recent advances in knowledge of molecular bases for cellular function to disease states (diagnosis, prevention, and treatment). Prerequisite: consent of instructor.

211 Chromosome Structure and Function (4) W every third year beginning 1989. Lecture, three hours; demonstration, one hour. Recent concepts of chromosomal function and structure, exposure to modern electronmicroscopic techniques and their interpretation. Prerequisite: consent of instructor. (Coordinators, Hamkalo and Manning)

212 Molecular Genetics of Gene Expression in Eucaryotes (4) S. Lecture or discussion, two hours. An examination of progress in elucidation of mechanisms controlling gene expression. Prerequisite: consent of instructor.

214 Biosynthesis of Nucleic Acids (4) F every third year beginning 1985. Lecture, three hours. Structure, function, and replication of DNA and RNA in procaryotes and eucaryotes; emphasis on current research. Prerequisite: consent of instructor. (Coordinator, Tewari)

215 Mechanisms of Recombination (3) W every third year beginning 1980. Lecture or discussion, two hours. Molecular mechanisms utilized in genetic recombination. Prerequisite: consent of instructor. (Coordinator, Warner)

216 Comparative Metabolism (4) W of every third year beginning 1984. Lecture, two hours. Assumes a background in the more universal metabolic pathways. Examines metabolic diversity, particularly among the procaryotes, with emphasis on the mechanism of ATP production and important biosynthetic pathways involved in the recycling of elements. Reviews of these topics and specific research articles illustrating individual pathways are read. Prerequisite: consent of instructor. (Coordinator, Woolfolk)

221 Advanced Immunology (4) S every third year beginning 1983. Lecture, three hours; discussion, one hour. History, techniques, and concepts of humoral antibody formation and cellular immune patterns. Advanced topics in transplantation and tumor immunobiology. Prerequisite: Biological Sciences 121 or consent of instructor. (Coordinator, Granger)

224 Mechanisms of Viral Transformation (4). Lecture, three hours. The molecular mechanisms by which RNA and DNA tumor viruses transform cells. Emphasis on current research papers. Prerequisite: Molecular Biology and Biochemistry 205.

226 Animal Virology (4) S every third year beginning 1986. Lecture, two hours. Elements of viral infection, including the role of viruses as potential oncogenic agents. Prerequisite: consent of instructor. (Coordinator, Wagner)

231 Genetic Analysis of Complex Cell Functions (4) F of every third year beginning 1984. Lecture, three hours. The application of genetic and recombinant DNA technology to analysis of bacterial and lower eucaryotic cell structures and functions. Topics, which may vary from year to year, include metabolic pathways, regulatory systems, the cell cycle, protein determination and secretions, assembly of cell structures, organelle biogenesis and other multigenic activities. Prerequisite: consent of instructor. May be repeated for credit. (Coordinator, R. Davis)

264 Colloquium in Biophysical Chemistry (2) W. Colloquium, two hours. Presentation of research topics in biophysics and biophysical chemistry. Faculty and invited speakers address the fundamentals and background of physical approaches to biological problems and the experimental results obtained with them. Supplementary reading required. Prerequisites: Chemistry 130A-B-C, Chemistry 131A-B-C, or equivalent. Graduate standing. Satisfactory/Unsatisfactory only. Same as Physiology and Biophysics 264 and Chemistry 264. May be repeated for credit.

280 Advanced Topics in Biochemistry and Molecular Biology (3) F. Lecture, five hours. Selected topics in specified areas of concentration, e.g., nucleic acids, protein biochemistry, genetic expression, biochemical genetics. Specific topics announced in advance. Prerequisites: Biological Sciences 106 and 107 and consent of instructor. Normally taken with Molecular Biology and Biochemistry 205A. Open to advanced undergraduates.

290A-B-C Colloquium in Molecular Biology and Biochemistry (2-2-2) F, W, S. Colloquium, one and one-half hours. Contemporary research problems in molecular biology and biochemistry. Invited speakers present research and/or review topics. Satisfactory/Unsatisfactory only. May be repeated for credit.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

Department of Psychobiology

Faculty

Dana Aswad: Neurochemistry and molecular neurobiology
 Michel Baudry: Cell biology and neurochemistry
 Carl Cotman: Neurochemistry
 Robert K. Josephson: Invertebrate neurophysiology
 Mary-Louise Kean: Neural mechanisms of human cognitive systems
 Herbert P. Killackey: Developmental neuroanatomy
 Michael Leon: Physiological and behavioral aspects of reproduction and development
 Gary S. Lynch: Brain plasticity and behavior
 John Marshall: Neuropharmacological approaches to behavioral analysis
 James L. McGaugh: Neurobiology of learning and memory
 Ricardo Miledi: Synaptic physiology and molecular neurobiology
 Ian Parker: Synaptic physiology
 Arnold Starr: Cognitive and sensory neuroprocesses
 Katumi Sumikawa: Molecular neurobiology
 Norman M. Weinberger: Neural bases of attention and learning
 Pauline I. Yahr: Behavioral neuroendocrinology

Psychobiology is concerned with the biology of the nervous system and behavior. The Department of Psychobiology emphasizes the adaptive aspects of neural and behavioral plasticity. The faculty's research interests include the biochemical, endocrinological, genetic, and experiential determinants of nervous system function and behavior. Focal topics include synaptic processes, neurophysiology, neuroendocrinology, neuroanatomy, molecular neurobiology, neuropharmacology, theoretical neurobiology, arousal and attention, learning and memory, reproductive behavior, and communication. The importance of developmental and comparative approaches to these problems is stressed.

The Department of Psychobiology offers graduate training leading to the Ph.D. in Biological Sciences. Graduate students must complete a sequence of core courses (lectures and laboratories) during their first and second years. They also must take a minimum of four advanced courses before graduation and must participate in directed research and teaching each year. To advance to candidacy, the student must prepare a critical review paper in the area of the proposed dissertation research and must pass an oral examination in psychobiology by the end of the third year. Graduation depends on successful preparation and oral defense of a dissertation based on the student's research. Students are expected to complete this program in five years of study.

Ideally, applicants for this program should have taken undergraduate courses in biology (one introductory year plus some advanced work), psychology (experimental, physiological, and learning), chemistry through biochemistry, introductory physics, calculus, and statistics. They also must submit GRE Aptitude test scores. Because graduate training emphasizes research, preference is given to applicants having laboratory research experience as undergraduates. The Department accepts only those students seeking a doctorate, though students who do not successfully complete their course work or do not advance to candidacy may, with the consent of the faculty, complete a Master's thesis and receive an M.S. degree in Biological Sciences. Applicants with substantial outside commitments that would curtail laboratory research or prolong the time to degree are not accepted. Students are encouraged to take the GRE no later than October. The deadline for application is February 1.

Courses in Psychobiology

200A-B-C Research in Psychobiology (2 to 12 per quarter) F, W, S. Individual research supervised by a specific professor. Prerequisite: consent of instructor.

202 Neural Systems (6). Lecture, four and one-half hours. An analysis of neural systems from an anatomical viewpoint. Emphasis on both gross aspects and cellular aspects of neural function. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

203 Neurochemistry (1-4). Lecture, four and one-half hours. The chemical basis for neural function is addressed. Both intracellular and intercellular aspects of neural function are discussed with an emphasis on central nervous system activity. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

204 Neurophysiology (1-4). Lecture, four and one-half hours. Biophysical mechanisms of membrane potentials, neuronal conduction synaptic transmission, and muscle contraction. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

205 Animal Behavior (1-4). Lecture, four and one-half hours. An examination of species-typical patterns of behavior from the perspective of modern evolutionary thought. Content varies. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

206 Integrative Neurobiology (1-4). Lecture, four and one-half hours. Discussion centers around an integrated view of neural systems, using anatomical, physiological, chemical, and behavioral approaches. Content varies. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

207 Methods in Psychobiology (1-4). Laboratory, four and one-half hours. Histology, neurochemistry, electronics, behavior, and neurophysiology are taught in a laboratory, using modern methods. Content varies. Two sections may be taken concurrently. Prerequisite: Psychobiology graduate student or consent of instructor.

208A-B-C Graduate Core Laboratory (2-2-2) F, W, S. Laboratory, six hours. Use of contemporary techniques in neurobiology and behavioral biology. Neuroanatomy: gross and microscopic techniques for analyzing neural tissue, including neurohistology with normal and experimental material. Neurochemistry: biochemical techniques for analysis of brain tissue, including separation and identification of cellular constituents. Neurophysiology: bioelectronics, electrophysiological methods for single units, multiple units, gross field potential, and the electroencephalogram.

209 Modern Processes in Psychobiology (1-4). Lecture, four and one-half hours. Discussion of various aspects of psychobiological research. Content varies. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

210 Learning and Memory (1-4). Lecture, four and one-half hours. A survey of the biological basis for learning and memory. Prerequisite: Psychobiology graduate student or consent of instructor. May be repeated for credit.

240 Advanced Analysis of Learning and Memory (4) F of odd years. Lecture and seminar, three hours. Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage.

241 Advanced Analysis of Hormones and Behavior (4). Lecture and seminar, three hours. Relationships that exist among endocrine secretions, the brain, and behavior. The biology of reproduction is covered in detail as are the roles of hormones in development stress and social behavior.

242 Development of Synaptic Functions (4) S. Lecture and seminar, three hours. Analysis of the ontogenetic development of synaptic functions in the brain and peripheral nervous system. Emphasis at the molecular and cellular levels. Prerequisite: graduate status in Psychobiology or consent of instructor.

243 Advanced Analysis of Comparative and Developmental Neurobiology (4) S of even years. Lecture and seminar, three hours. The vertebrate nervous system approached from both its phylogenetic and ontogenetic history. Emphasis is given to contemporary experimental approaches to selected neuronal systems.

244 Advanced Neurochemistry (4) W of even years. Lecture and seminar, three hours. Integrated survey of the chemical and physiological mechanisms of synaptic transmission. Selected topics include growth and modification of synaptic connections from a chemical viewpoint.

246 Advanced Analysis of Attention and Learning (4) S of odd years. Lecture and seminar, three hours. Consideration of behavioral and neural aspects of attention. Examination of the concept of "attention" from a behavioral point of view, and classical and current approaches to brain mechanisms which form the substrates of behavioral attention.

247 Advanced Integrative Neurobiology (4). Lecture and seminar, three hours. Consideration of selected topics in neurobiology in which multidisciplinary approaches have been used to analyze function.

248A Fundamentals of Evoked Potentials (4). Lecture, two hours. Introduction to the study of the electrical activity of the human brain from the brainstem to the cerebral cortex. Prerequisite: consent of instructor. Same as Social Sciences 252A.

248B Evoked Potential of Sensory and Cognitive Aspects (4). Lecture, three hours. An advanced course on the study of the electrical activity of the human brain concentrating on the cerebral cortex. Prerequisite: Psychobiology 248A or consent of instructor. Same as Social Sciences 252B.

249 Electronics for Biologists (4) W. Lecture, three hours; laboratory, four hours. Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

250 Advanced Analysis of Brain and Behavior (4). Analysis of basic mechanisms underlying behavioral change and plasticity. Emphasis on recovery of function after brain injury and neuropharmacological/neurochemical approaches to cellular plasticity.

251 Clinical Neurology for Neuroscientists (4) S of odd years. Presentation of problems of clinical neurology through patient presentation, examination, and discussion. Patients with lesions or defects at various levels of the nervous system are examined.

252 Advanced Analysis of Animal Behavior (4) W of odd years. Lecture and seminar, three hours. Consideration of the adaptive functions of species-typical behavior patterns, as well as their physiological control and ontogeny.

253 Advanced Analysis of Muscle and Other Effectors (4) F of even years. Biophysics and biochemistry of striated muscle, proteins of muscle and their organization, sliding filament model of muscle contraction, calcium as a regulator of contractile activity, structural organization of control systems, neurological control of contractile activity, muscle kinetics, and thermodynamics.

254 Molecular Neurobiology (4) S. Lecture, three hours. The application of genetic and recombinant DNA technology to neurobiology. Topics include the study of neuronal proteins which play important roles in the formation of synapses and synaptic transmission.

255 Topics in Behavioral and Cognitive Neuroscience (2-2). Seminar, two hours. The biological basis of the internal knowledge

which influences and in many cases determines behavior. Examination of the foundations of the study of cognitive capacities such as memory, perception, and action.

NOTE: Consent of instructor required for seminar courses numbered 260-275. In order to earn four units of credit, three quarters must be taken. Partial credit may be earned for individual segments.

260 Seminar in Learning and Memory (1.3) F, W, S

261 Seminar in Neurochemical Basis of Plasticity (1.3) F, W, S

262 Seminar in Molecular Neurobiology (1.3) F, W, S

263 Seminar in Comparative and Developmental Neurology (1.3) F, W, S. Open only to Psychobiology graduate students.

264 Seminar in Neurochemistry (1.3) F, W, S. Open only to Psychobiology graduate students.

265 Reproductive Physiology and Behavior (1.3) F, W, S.

266 Seminar in Attention and Learning (1.3) F, W, S. Open only to Psychobiology graduate students.

267 Seminar in Neural Systems (1.3) F, W, S. Open only to Psychobiology graduate students.

268 Seminar in Theoretical Neurobiology (1.3) F, W, S. Open only to Psychobiology graduate students.

270 Seminar in Neuromechanisms (1.3) F, W, S. Open only to Psychobiology graduate students.

271 Seminar in Auditory Neurophysiology (1.3) F, W, S. Open only to Psychobiology graduate students.

272 Seminar in Neurophysiology of Behavior (1.3) F, W, S. Open only to Psychobiology graduate students.

273 Seminar in Comparative Behavior (1.3) F, W, S. Open only to Psychobiology graduate students.

275 Seminar in Cellular and Molecular Neurobiology (1.3) F, W, S.

290 Colloquium in Psychobiology (1.3) F, W, S. Lecture, three-fourths hour; discussion, three-fourths hour. Presentation of contemporary research problems in psychobiology and related areas by invited speakers. Satisfactory/Unsatisfactory only. May be repeated for credit.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

Department of Anatomy and Neurobiology

Faculty

Edward G. Jones, *Department Chair*: Sensory-motor anatomy and physiology

Robert H. Blanks: Vestibular physiology and anatomy
James H. Fallon: Monoamine systems, neuronal growth factors and neurotransmitter interactions

Christine M. Gall: Central nervous system morphological plasticity

Roland A. Giolli: Experimental neuroanatomy; visual system

Stewart H.C. Hendry: Visual cortex structure and plasticity

Paul J. Isackson: Molecular biology of neurotrophic factors

Herbert P. Killackey: Developmental neuroanatomy; somatosensory system

Leonard M. Kitzes: Auditory neurophysiology; anatomy; development

Diane K. O'Dowd: Molecular biology of membrane ion channels

Charles E. Ribak: Neurocytology; immunocytochemistry of neurotransmitters; neuronal circuitry

Richard T. Robertson, *Department Vice Chair*: Experimental neurobiology; forebrain development

Malcolm N. Semple: Auditory neurophysiology

Martin A. Smith: Molecular neurobiology of synapses

John E. Swett: Peripheral nervous system, spinal cord, pain mechanisms

Yasuhiro Torigoe: Visual and vestibular regulation of eye movements

The Department of Anatomy and Neurobiology in the College of Medicine offers a doctoral program leading to the Ph.D. degree in Biological Sciences, with specialized research training in the neurosciences. Research programs in the neurosciences include neurotransmitter immunocytochemistry, intracellular physiology, molecular neurobiology, fore-brain organization and function, and development, structure and function of sensory and motor systems. The Department maintains research facilities so that the student can become experienced with the following techniques: electron microscopy; immunocytochemistry; fluorescence histochemistry; neuroanatomical tracing; single- and multiple-unit neurophysiology; and computer analysis of neuroscientific data. Students are encouraged to become proficient in multiple areas of study using interdisciplinary techniques.

Students in the Department of Anatomy and Neurobiology have two major goals. The first goal is to attain the necessary technical skills, theoretical background, and experimental knowledge necessary to conduct innovative, fundamentally important research. The second goal is to gain the knowledge and ability to teach graduate, undergraduate, and professional courses in anatomy and neuroscience. These two goals are achieved through a basic and extended academic program that is tailored to the individual needs of the student.

The core curriculum is designed to provide all students with a fundamental knowledge of modern neurobiology, with an emphasis on morphology, chemistry, and physiology. In the first year, students are required to take selected courses in neuroanatomy and physiology, including a year-long course in neural science techniques. In the second year, students take a year-long course in neural systems, as well as biochemistry and pharmacology courses. Over the usual four-year training period the student is required to complete a practical course in statistics, selected departmental seminar courses, at least two laboratory rotations, and a total of 50 credit hours of research in anatomy. Elective courses in the Department of Anatomy and Neurobiology or other departments on campus may also be taken. The student typically devotes the majority of the first year to taking core courses and about half of the second year to taking electives. Following the first year, the student is expected to act as an assistant in the neuroanatomy core course.

When a student is accepted into the graduate program, the student and the Graduate Committee decide to which laboratories the student will be assigned the first year. During the first year the student will spend approximately 25 percent of the time doing research. By the end of the second year the student and the Graduate Committee select a faculty sponsor who will supervise the dissertation research. A Qualifying Examination at the end of the summer of the second year is given to the student by a Candidacy Committee. The examination consists of written papers in three of the following areas: molecular and cellular neuroscience, developmental neuroscience, neural systems-sensory, neural systems-motor, and neural systems-other.

The dissertation research is chosen by the student and faculty advisor under guidance of the Graduate Committee, and an oral research proposal is made. The majority of the second, third, and fourth years is devoted to completing the research and preparing a written dissertation suitable for publication.

An oral defense of the dissertation research before the student's advisor and Doctoral Committee constitutes the final examination. The Ph.D. degree in Biological Sciences is awarded following completion of all the requirements, a process that normally will take four years to complete.

Courses in Anatomy and Neurobiology

200 Research in Anatomy (2-12) F, W, S, Summer. Individual research supervised by a particular faculty member. Prerequisite: consent of instructor. May be repeated for credit.

201 Human Gross Anatomy (8) F. Lecture, three hours; laboratory, nine hours. Study and dissection of the human body, including muscular, skeletal, nervous, and cardiovascular systems. Emphasis on both normal and abnormal structure and function. Prerequisites: graduate standing, consent of instructor.

202 Human Neuroanatomy (7) W. Lecture, four hours; laboratory, four hours. Survey of basic structure of the nervous system, with emphasis on clinical relevance and problem solving. Prerequisites: graduate standing, consent of instructor.

203 Human Microscopic Anatomy (6) S. Lecture, four hours; laboratory, two hours. Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues. Prerequisites: graduate standing, consent of instructor.

205 Aspects of Higher Brain Function (2) S of odd years. Lecture, one hour; discussion, three hours. Seminar course covering structure and functions of the cerebral cortex with an emphasis on sensory and motor systems. Prerequisites: graduate standing, consent of instructor.

206 Tutorial in Anatomy. Tutorial, three hours. Series of tutorials on advanced topics in anatomy. Each may be repeated for credit.

206A Surgical Anatomy (3) F. Exploration of topics in gross anatomy. Dissection/library work required. Prerequisites: Anatomy 201A-B.

206B Neuroanatomy (3) W. Exploration of special topics in neuroanatomy. Primarily library work, but study of prepared slides also included. Prerequisite: Anatomy 202.

206C Microanatomy (3) S. Special topics in microanatomy. Primarily library work, but study of prepared histological slides and photographs included. Prerequisites: Anatomy 203A-B.

207 Series on Sensory Systems. Seminar, three hours. The anatomy of brain sensory systems.

207A Anatomy/Function of Subcortical Visual and Oculomotor Systems (3) F. Consideration of the anatomy and function of certain portions of the subcortical pathways and nuclei which make up the visual and the oculomotor systems of vertebrates. Neuroanatomical connections between parts of the visual and oculomotor systems of the brainstem. Recent advances that pertain to vision and the control of eye and neck movements. Prerequisites: chiefly for Anatomy graduate students, consent of instructor. Pass/Not Pass only.

207B Structure and Function of the Auditory System (3) F of even years. Principles of transduction, stimulus coding, and information transfer in the mammalian auditory system. Functional organization and single neuron physiology of the auditory system emphasized. Students present seminars on relevant topics. Prerequisite: consent of instructor.

208 Neural and Cellular Anatomy. Seminar, three hours. Seminars covering cellular aspects of anatomy.

208A Neurocytology (3) W of even years. Ultrastructure of the nervous system is studied so that an understanding of neuronal function may be gained. Topics include cell body, dendrites, axons, synapses, myelin, glia, blood-brain barrier, meninges, analysis of neuropil, and experimental techniques. Prerequisite: consent of instructor.

208B Neurotransmitter Pathways: Monoamine Systems (3) F of even years. Detailed review of the organization of central monoamine pathways. Dopamine, norepinephrine, epinephrine, and serotonin systems analyzed with respect to cell bodies of origin pathways and terminal areas innervated in the brain. Prerequisite: consent of instructor.

208C Cellular Diversification (3) S of odd years. Ultrastructure of cells, including alterations and their organelles, as they relate

to the myriad of diverse functions required in a complex functioning organism. Prerequisite: consent of instructor.

208D Advanced Analysis of Comparative and Developmental Neurobiology (3) S of odd years. Vertebrate nervous system approached from both its phylogenetic and ontogenetic history. Emphasis on contemporary experimental approaches to selected systems. Prerequisite: consent of instructor.

208E Functional Anatomy of the Peripheral Nervous System (3) F of even years. Seminar program designed to review critically the modern literature pertaining to the detailed structure and functional organization of peripheral nervous systems of mammals with emphasis on specialization of nerve endings. Prerequisite: consent of instructor.

208F Morphological Plasticity in the Central Nervous System (3) F of even years. Lecture, three hours. Seminar intended to guide a review of the literature on morphological plasticity in the central nervous system. Each student selects a topic for which they will compile a reading list and lead a group discussion. Prerequisite: consent of instructor. May be repeated for credit.

209A-B-C Neural Science Techniques (4-4-4) F, W, S. A year-long laboratory and lecture course on aspects of neural science methodology divided into fall (209A), winter (209B), and spring (209C) sections which may be taken separately with the consent of the instructor. **209A:** Basic neuroanatomical techniques; pathway tracing techniques; fluorescence microscopy and immunocytochemistry. **209B:** Basic electrophysiological techniques; laboratory computer techniques; electron microscopy. **209C:** Biological photography; molecular neurobiology and neurochemistry. Prerequisite: consent of instructor.

210 Systems Neuroscience (4-4-4) F, W, S. Lecture and discussion, six hours. A year-long lecture and seminar course with a systems approach to understanding the nervous system, divided into fall (210A), winter (210B), and spring (210C) sections which may be taken separately with the consent of the instructor. Prerequisite: second-year graduate standing and consent of instructor. **210A:** Chemically defined systems. **210B:** Structure and function of sensory systems. **210C:** Motor, limbic, and cognitive systems.

Department of Biological Chemistry

Faculty:

Ralph A. Bradshaw, *Department Chair*: Structure and function of enzymes and growth factors and their genes
 Stuart M. Arfin: Genetic and biochemical regulatory mechanisms in mammalian systems
 Chris L. Greer: Eukaryotic RNA processing pathways; RNA splicing and gene expression
 Michelle M. Hanna: Mechanisms of regulation of gene expression determined by laser crosslinking
 Kenneth H. Ibsen: Properties, distribution, and control of expression of isoenzymes
 Lee McAlister-Henn: Molecular genetics of compartmentalized isozymes
 Calvin S. McLaughlin: Genetic and biochemical approaches to the synthesis of proteins and ribonucleic acids and their regulation in eucaryotic cells
 Masayasu Nomura: Structure, function, and biosynthesis of ribosomes; regulation of gene expression
 Robert E. Steele: Function of cellular oncogenes in regulating cell growth, physiology, and morphology
 John J. Wasmuth: Regulation of amino acid metabolism; mammalian cell genetics

Graduate instruction and research in molecular and cellular biochemistry leading to the Ph.D. in Biological Sciences is offered by the Department of Biological Chemistry in the College of Medicine. The curriculum is designed to prepare students for creative and productive careers in academic science and biotechnology. Faculty research interests focus on the regulation of gene expression (RNA splicing, mammalian chromosomal organization, and nucleic acid-protein interactions) and the regulation of cellular processes (membrane-hormone interactions, regulation of protein synthesis,

molecular genetics of metabolic processes, and intracellular protein localization). Students are exposed to technical expertise in all facets of current research in molecular biochemistry from protein chemistry to genetic engineering.

In the first year emphasis is placed on immediate research participation supported by formal course work in protein and nucleic acid chemistry and function, enzymology, biological regulatory mechanisms, cell biology, and somatic cell and molecular genetics. Initial laboratory experiences are achieved by rotation through several laboratories with selection of an advisor occurring at the end of the first year. Student competence and critical thinking in the molecular aspects of biological sciences is tested by comprehensive examination following the first year of study. At the beginning of the third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. Completion of the Ph.D. degree normally requires five years.

Applicants for admission are expected to be well-prepared in the biological and chemical sciences. Graduate Record Examination (GRE) General Test and Biology or Chemistry Subject Test scores are required.

Courses in Biological Chemistry

280 Model Systems in Molecular Biology (4) S every third year beginning 1990. Lecture, three hours; discussion one hour. Focuses on the selection of biological models for applications in molecular biology. Emphasis on biological/genetic features of a model system which facilitate the study of gene structure/function, genome organization, cellular and metabolic-compartmentation, and growth control.

285 Advanced Cellular Biochemistry (4) W. Lecture, three hours. Structures and events which are localized at or near the cell membrane. Membrane structure, the extracellular matrix, receptors, and cell-cell interactions.

292 Topics in Biological Chemistry (2) F, W, S. Seminar, two hours. Students present seminars on topics in biological chemistry. Topics vary. Prerequisite: consent of instructor.

299 Physical Chemistry for Biological Sciences (3) F. Lecture, three hours. Covers the essential concepts of physical chemistry with an emphasis on application to the biological sciences. This includes thermodynamics, kinetics, quantum chemistry, spectroscopy, and an introduction to protein chemistry.

Additional courses are taught by faculty from the Department of Molecular Biology and Biochemistry. Graduate students in Biological Chemistry select the courses currently listed in the Department of Molecular Biology and Biochemistry section (see page 98). Generally, graduate students are required to take Molecular Biology and Biochemistry 203 through 208 and Biological Chemistry 299. Topics in advanced graduate courses offered by the Department include human genetics, growth factors and oncogenes, yeast molecular genetics, and protein/nucleic acid interactions. Additional course work is based on the interests of individual students.

Department of Microbiology and Molecular Genetics

Faculty

- Dennis D. Cunningham, *Department Chair*: Regulation of cell division; control of extracellular proteinases by protease nexins
- Alan L. Goldin: Molecular biology of the sodium channel; neurotropic virus-cell interactions
- George A. Gutman: Immunogenetics; antibody structure and gene organization
- G. Wesley Hatfield: Molecular mechanisms of biological control systems in *Escherichia coli*
- Harris S. Moyed: Molecular genetics of antibiotic persistence in bacteria
- Suzanne B. Sandmeyer: Eukaryotic gene organization; transposable elements and tRNA genes in yeast
- Rozanne Sandri-Goldin: Molecular biology of herpesvirus; regulation of eukaryotic gene expression
- Bert L. Semler: Molecular biology of RNA viruses; expression of cloned DNA copies of poliovirus RNA in eukaryotic vectors
- Stephen J. Sharp: Molecular genetics of RNA polymerase III gene transcription
- Eric J. Stanbridge: Molecular genetics of cancer; mycoplasmas; medical microbiology
- Paul S. Sypherd: Molecular genetics of cellular morphogenesis in microorganisms

Graduate instruction and research in microbiology and molecular genetics leading to the Ph.D. in Biological Sciences is offered by the Department of Microbiology and Molecular Genetics, College of Medicine. The curriculum of the Department is designed to provide advanced training to individuals interested in the molecular basis of genetic regulation in viruses, microorganisms and cultured mammalian cells, and in the structure, genetics, and synthesis of immunoglobulins. The core curriculum focuses on the molecular biology and genetics of viruses and bacteria, the fundamentals of the immune response, the molecular biology of cultured animal cells, and the genetics and physiology of infectious agents.

It is strongly recommended that the student's undergraduate preparation include courses in calculus, physical chemistry, biochemistry, genetics, and general biology, and that the applicant take the Biology Advanced Test of the Graduate Record Examination. Before a graduate degree will be awarded, the student must demonstrate competence by course work and examination in biochemistry, physical chemistry, genetics, molecular biology, and various aspects of microbiology and immunology. During the first year, all students in the graduate program spend nine weeks in each of four faculty members' laboratories with the aim of becoming familiar with the research approaches and the laboratory techniques employed in each specific research area. Incoming students review their programs each quarter with the departmental graduate student advisor. During the fall of the third year, each student takes an advancement to candidacy examination. Graduate students are required to take Molecular Biology and Biochemistry 203 through 208 and Microbiology and Molecular Genetics courses. The major remaining requirement for the Ph.D. degree will be the satisfactory completion and oral defense of a dissertation consisting of original research carried out under the guidance of a faculty member. Students with adequate preparation should be able to complete the Ph.D. within five years.

Courses in Microbiology and Molecular Genetics

200A-B-C Research in Microbiology and Molecular Genetics (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor. May be repeated for credit.

201A-B-C Research Topics in Microbiology and Molecular Genetics (1-1-1) F, W, S. Lecture and seminar. Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology. Research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments. Prerequisite: consent of instructor. May be repeated for credit. Satisfactory/Unsatisfactory only.

203A-B-C Advanced Studies in Microbiology and Molecular Genetics (1-1-1) F, W, S. Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs. Satisfactory/Unsatisfactory only. May be repeated for credit.

210A-B Medical Microbiology (4-6) F, S. Lecture, five hours; laboratory, three hours. Advanced course for medical students in the College of Medicine. Biochemical and genetic properties of infectious agents, identification and behavior of pathogens, activities of toxins, chemotherapy, biochemical genetics of drug resistance, humoral and cell-mediated immunity, introduction to diagnosis, treatment, and epidemiology of infectious diseases. Prerequisites: prior course work in microbiology and biochemistry and consent of instructor.

212 Molecular Biology of Microbial Diversity (4) S. Lecture, three hours. The diversity of the microbial world from a biological and metabolic perspective. Focuses on several microbial groups and their unique way of dealing with their ecological niche. Examples of metabolic preparedness selected from the spore-forming, aquatic *Caulobacter*, a thermophilic bacteria. Prerequisite: consent of instructor.

213 Advanced Prokaryotic Molecular Genetics (3) W. Lecture, two hours. Emphasis on molecular genetics of *Escherichia coli* and bacteriophage lambda. Required for first-year students.

215 Immunology (4) W. Lecture, four hours. Cellular and humoral mediated immunity are the principal means of defense against infection by pathogenic microorganisms, viruses, and host cells. Topics include antibody-antigen reactions, molecular and cellular aspects of antibody formation, immunoglobulins and their genes, B- and T-cell differentiation, and the cellular basis for immune responses. Required for first-year students. Prerequisite: consent of instructor.

216 Pathogenic Microbiology (4) S. Lecture, four hours. Biochemical and genetic properties of infectious agents; identification and behavior of pathogens; activities of toxins; the chemotherapy, biochemistry, and epidemiology of infectious diseases. Prerequisite: consent of instructor.

217 Special Topics in Molecular Virology (4) F. Lecture, two hours; seminar. An advanced course which focuses on the mechanisms of gene regulation in animal viruses and on the molecular basis of viral pathogenesis. Prerequisite: consent of instructor.

218 Advanced Eukaryotic Molecular Genetics (4) S. Lecture, three hours. A comprehensive analysis of eukaryotic gene regulation. Studies of positive and negative regulation of RNA polymerase II transcription utilizing SV40, adenovirus, and herpes simplex virus as model systems and including the interaction of cis-acting signals and trans-acting factors. RNA polymerase III studies utilizing *Drosophila* tRNA and 5S RNA genes as model systems. Prerequisite: consent of instructor.

219 Medical Virology (4) S. Lecture, four hours. Animal viruses as disease causing agents, including mechanisms of infection at both the cellular and organismic levels. Topics include comparative studies of various groups and role of the immune system in virus infections. Prerequisite: consent of instructor.

260 Introductory Molecular Genetics (2) W. Selection and development of experimental approaches to basic problems in molecular biology. Theoretical considerations in selecting a particular experimental approach are given. Student presentations drawing on scientific papers using different experimental strategies to solve a common problem, such as DNA sequence analysis. Required for first-year students.

280A-B-C Tutorial in Microbiology and Molecular Genetics (2-2-2) F, W, S. Tutorial, two hours. Presented by various members of the faculty; relates current laboratory research to the literature.

Department of Physiology and Biophysics

Faculty

Kenneth M. Baldwin, *Acting Department Chair*: Hormonal and exercise factors regulating biochemical properties of muscle

Michael E. Barish: Neuronal differentiation; physiology of neuroglia

Marianne Bronner-Fraser: Developmental neurobiology; migration and differentiation of the avian neural crest

Michael D. Cahalan: Ion channels in the nervous and immune systems

Scott E. Fraser: Developmental neurobiology and pattern formation; development and plasticity of the lower-vertebrate visual system; gap junctions in tissue patterning

Alan L. Goldin: Molecular biology of neural channels and receptors

Harry T. Haigler: Cellular and molecular mechanisms by which EGF stimulates cell replication

James E. Hall: Molecular aspects of ionic conductance in membranes; channel reconstitution

Daniel Hollander: Gastrointestinal physiology, aging, and nutrient absorption

Russell E. Jacobs: Peptide-membrane interactions; MRI in developmental biology

Janos K. Lanyi: Bioenergetics of membrane transport by bacterial retinal proteins

Kenneth J. Longmuir: Metabolism and intracellular transport of lipid in mammalian cells; metabolism of pulmonary surfactant

John D. Scott: Structure and function of protein kinases

Larry E. Vickery: Enzyme mechanisms and regulation of steroid hormone biosynthesis

Harry Walter: Characterization of cell membrane surfaces by partitioning in two-polymer aqueous systems

Stephen H. White: Membrane structure; physical chemistry of membranes and lipid bilayers

Graduate instruction and research in physiology and biophysics leading to the Ph.D. in Biological Sciences is offered by the Department of Physiology and Biophysics, College of Medicine. The Department provides research opportunities in the molecular biophysics of membranes and proteins; endocrinology; molecular and cell biology; developmental neurobiology; pulmonary and exercise physiology. The core curriculum provides the student with a broad background in physiology and biophysics and the closely related fields of cell biology and biochemistry. Elective courses permit in-depth exploration of particular areas. Interdisciplinary dissertation research involving the research of more than one faculty member is encouraged.

Prerequisites for admission normally include a bachelor's degree in one of the biological sciences, physics, chemistry, mathematics, or engineering, as well as undergraduate courses in calculus, organic and physical chemistry, biochemistry, and advanced biology (e.g., neurophysiology, cell biology, neurobiology, psychobiology). Up to two prerequisites may be fulfilled as first-year electives. GRE Aptitude and Advanced tests are required. Preference will be given to those students who have prior research experience.

The Department admits about three highly qualified students each fall. The program emphasizes original research, and students are expected to become involved in the research of the

Department as early as possible. The core program includes graduate courses in physiology, biophysics, biochemistry, and cell biology. After the first year, training continues through in-depth coverage of topics of faculty expertise. These advanced physiology courses combine discussion with laboratory exercises. Students participate in a research seminar designed to strengthen research techniques and present as well as attend the weekly colloquium in physiology. The third and fourth years are spent primarily in research. Each student must submit a written dissertation on an original research project and successfully defend this dissertation in an oral examination.

Incoming students receive academic advising from the Department Graduate Advisor until such time as they choose a dissertation advisor. The faculty conducts quarterly reviews of all continuing students to ensure that they are maintaining satisfactory progress within their particular academic program. Students who have completed all necessary prerequisites should be able to complete the Ph.D. within five years.

A comprehensive examination is administered in June at the end of the second year. The examination is based upon material in the advanced physiology series and is designed to test the student's ability to organize a body of knowledge and to think critically. Sometime during the third year, the student presents a seminar on a topic assigned by the formal candidacy committee. Following the seminar, the committee critically examines the student's qualifications for the successful conduct of the doctoral dissertation. Advancement to candidacy for the Ph.D. is recommended to the Dean of Graduate Studies upon the unanimous vote of the committee.

Some faculty from the Department are members of an interdisciplinary biophysics and biophysical chemistry group. See page 95 for a description of the program.

Courses in Physiology and Biophysics

200 Research in Physiology and Biophysics (2-12 per quarter) F, W, S. Individual research directed toward doctoral dissertation and supervised by a particular professor. Prerequisite: consent of instructor. May be repeated for credit.

201 Introduction to Physiology Research (1-4 per quarter) F, W, S. Introduction to research in physiology and related sciences. Students concentrate on techniques emphasized in the various laboratories of the Department. Prerequisite: consent of instructor. May be repeated for credit.

204A Cellular Biochemistry (3) F. Lecture, one hour; discussion, one hour; laboratory, four hours. Use of modern protein chemistry methods to partially purify and characterize an enzyme. Techniques include subcellular fractionation, protein solubilization, ion-exchange chromatography, polyacrylamide gel electrophoresis, immunoblotting, and enzyme assays. Prerequisites: graduate standing in Biological Sciences and consent of instructor.

204B Cellular Neurobiology (3) W. Lecture and discussion, three hours. The physiology of single cells. Emphasis on the cell biology of neurons, electric currents in cells, and sensory transduction. Computer simulations permit exploration of current flow in neurons. Students make an oral presentation. Prerequisites: graduate standing in Biological Sciences and consent of instructor.

204C Concepts of Biophysics (3) S. Lecture, three hours; laboratory, one hour. Properties of biological molecules and ions in solution; the behavior of biological molecules at interfaces; the concepts of kinetic order and kinetic rate theory; an introduction to basic principles of spectroscopy. Prerequisites: graduate standing in Biological Sciences and consent of instructor.

205 Instrumentation Laboratory in Physiology (3) S. Lecture, one-half hour; laboratory, three and one-half hours. Instrumentation methods useful in physiological research. Linear circuits, operational amplifiers, digital circuits, transistors, special circuits, and machine tools for constructing special apparatus.

206A-B Introduction to Medical Physiology (6-6) W, S. Lecture, six hours; discussion, two hours; other, two hours. Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function. Prerequisite: consent of Department.

207A-B-C Research Seminar (2-2-2) F, W, S. Students present public seminars on either laboratory research conducted during the quarter or on a topic from current literature chosen by the student and approved by the instructor. Students must attend other students' seminars. Prerequisite: consent of instructor.

220 Physiology of Muscular Activity (4). Lecture, one hour; discussion, three hours. Lectures, tutorials, and readings on hormonal, neural, and activity-related factors regulating phenotypic expression in skeletal and cardiac muscle. Topics include organelle components regulating the contractile process; energy metabolism; protein synthesis and degradation; hormones; neural and mechanical factors. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

230 Membrane Biophysics (4). Lecture and discussion, three hours. Structure and function of biological membranes, including the thermodynamics and structure of lipid bilayers, properties of ionic channels, fluctuation analysis, surface charges, and surface receptors. Techniques for studying membranes emphasized. Original papers read and a research proposal formulated by each student. Prerequisites: Chemistry 130A-B-C or 131A-B-C and Physiology and Biophysics 206A-B, or consent of instructor. May be repeated for credit.

232 Physiology of Ion Channels (3) S. Lecture, one hour; discussion, three hours. Molecular and biophysical properties of ion channels in excitable and nonexcitable cells. The physiological role of ion channels in a variety of cellular behaviors. Demonstrations in a hands-on workshop format include patch clamp recording, reconstitution of channels into lipid bilayer membranes, and analysis of single channel currents. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

250 Molecular Differentiation of the Nervous System (3) W. Lecture, one hour; discussion, three hours. A structured seminar with assigned readings and roundtable discussions. Focuses on molecules whose activities determine the most highly differentiated functions of nerve cells—excitability, sensitivity to transmitters and hormones, and connectivity. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

251 Molecular Physiology (3) S. Lecture, one hour; discussion, three hours. Applications of molecular biology and recombinant DNA technology in physiology. Topics include DNA sequencing, restriction endonucleases, cloning vehicles, cDNA and genomic libraries, expression of recombinant proteins, site-directed mutagenesis, and cellular perturbation methods. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

261 Membrane Structure and Cell Biophysics (3) F. Lecture, one hour; discussion and laboratory demonstrations, three hours. Basic physical chemistry, methods of biophysical research including magnetic resonance and X-ray diffraction, physical basis for membrane structure, membrane biogenesis. Analysis of key papers in the field of membranes. Demonstrations and exercises. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

262 Biopolymers in Solution (4). Lecture, three hours. Electronic, chiroptical, and magnetic resonance spectroscopy as applied to studies of biological molecules and macromolecules. Theoretical and practical aspects of sedimentation equilibrium and transport in the study of biological macromolecules. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent. Same as Molecular Biology and Biochemistry 262 and Chemistry 262.

264 Colloquium in Biophysical Chemistry (2). Colloquium, two hours. Presentations of research on topics in biophysics and biophysical chemistry. Faculty and invited speakers address the fundamentals and background of physical approaches to biological prob-

lems and the experimental results obtained with them. Supplementary reading required. Prerequisites: Chemistry 130A-B-C, Chemistry 131A-B-C, or equivalent. Satisfactory/Unsatisfactory only. Same as Molecular Biology and Biochemistry 264 and Chemistry 264. May be repeated for credit.

281 Signal Transduction (3) S. Lecture, one hour; discussion, three hours. Students read and discuss original manuscripts that describe mechanisms by which extracellular signals are transduced across plasma membranes and mechanisms by which cellular response machinery (e.g., ion channels, phospholipases, protein kinases, and the mitogenic pathway) is activated. Prerequisites: Physiology and Biophysics 206B and consent of instructor.

290 Colloquium in Physiology (1-1-1) F, W, S. Seminar, one and one-half hours. Contemporary research problems in physiology. Research students, faculty, and other invited speakers introduce research and review topics. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

299 Dissertation in Physiology and Biophysics (2-12 per quarter) F, W, S, Summer. Preparation and completion of the dissertation required for the Ph.D. or Master of Science degree. Prerequisite: consent of instructor. May be repeated for credit.

School of Fine Arts

Robert Hickok Dean

In every age and in every known society the arts have played a vitally important role. From this we infer not simply that the arts are, and always have been, important but also that artistic expression is a vital and essential human activity. The School of Fine Arts is concerned with the vitality of the arts in society. Faculty energies are directed toward the refinement, enhancement, and encouragement of students' artistic and creative talents and toward the development of the students' understanding of related theory and history.

The School of Fine Arts is dedicated to the creation and performance of all of the arts within the context of their history, theory, and criticism. The five departments which comprise the School are Art History, Dance, Drama, Music, and Studio Art, and each offers undergraduate and graduate degree programs which emphasize extensive studio and workshop experiences, essential theoretical and historical background studies, and exercises in criticism. In addition, an undergraduate program is offered in Fine Arts (General Interdisciplinary), and students may declare a double major by selecting either two majors from within the School or one from another academic unit and one from within the School.

The School is located in the Fine Arts Village section of campus and includes studio and classroom facilities; five modern, fully equipped theatres; a concert hall; and the University Art Gallery. The conventionally designed, 420-seat Fine Arts Village Theatre contains an orchestra pit and a large, completely equipped stage. The 230-seat Fine Arts Concert Hall features a thrust platform stage and a Baroque pipe organ. The Fine Arts Studio Theatre provides an experimental stage base without fixed seating, which allows complete freedom in determining the style of a production. Both the Little Theatre, located outside the Village in Humanities Hall, and the Village's Virginia and Norman Nixon Studio Theatre are intimate proscenium stages for drama workshops and graduate directing projects. The creation of productions is enhanced by the School's professionally operated scenery and costume shops. Additional facilities for fine arts students are described within the individual departmental sections which follow.

In addition to their classroom instruction, students in the School of Fine Arts and qualified students from other academic areas organize, participate in, and coordinate some of the School's various production units, including University Chorus, UCI Symphony Orchestra, University Theatre, bands and wind ensemble, exhibitions, dance concerts and workshops, drama workshops, music theatre and opera workshops, and the television studio. The School also sponsors visits by professional guest artists, lecturers, and other distinguished artists and scholars.

All students are assigned to faculty advisors and are encouraged to meet with them during orientation and throughout the year to plan programs of study and discuss educational and career objectives. In addition, students may seek assistance with programs, requirements, or other academic matters from the staff in the Fine Arts Counseling Office.

Degrees

Art History	B.A.
Dance	B.A., M.F.A.
Drama	B.A., M.F.A.
Fine Arts	B.A., M.F.A.
Music	B.A., B.Mus.
Studio Art	B.A.

Education Abroad Program

Upper-division, and in some cases graduate, students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61 and 62.

3-2 Program with the Graduate School of Management

Outstanding Fine Arts majors who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the Graduate School of Management section for further information.

Concentration in Religious Studies

The undergraduate Concentration in Religious Studies encourages students to examine religion and religious phenomena in the context of the several disciplines represented in the Schools of Humanities, Fine Arts, and Social Sciences. The Concentration, which is available with any major offered by these three Schools, is, for the most part, made up of courses already offered in the undergraduate curriculum; it allows students to organize these courses, however, into a program complementary to their major. It is the objective of the Concentration that participating students expand their appreciation and understanding of religion in the context of their own major discipline while also developing critical abilities in the area of religious studies in its own right. While the Concentration takes as its subject all religion and religious phenomena and courses are offered in non-Western religious subjects, the academic specialties of the majority of the contributing faculty lie in Western traditions.

Students electing the Concentration are required to take eight one-quarter courses from those approved for the Concentration. The courses are gathered into three generic categories: religious theory and comparative religions, canonical literature, and topics in religious studies. Students take two courses from each category as well as two additional courses from among those approved for the Concentration. For further information and a quarterly list of courses available, please contact the Coordinator of the Concentration, 343 Humanities Office Building.

Honors

Students who have distinguished themselves academically will be considered for honors at graduation. A general criteria is that students must have completed at least 72 units in residence at a University of California campus. In keeping with the Academic Senate Resolution no more than 12 percent of the graduating seniors may receive honors.

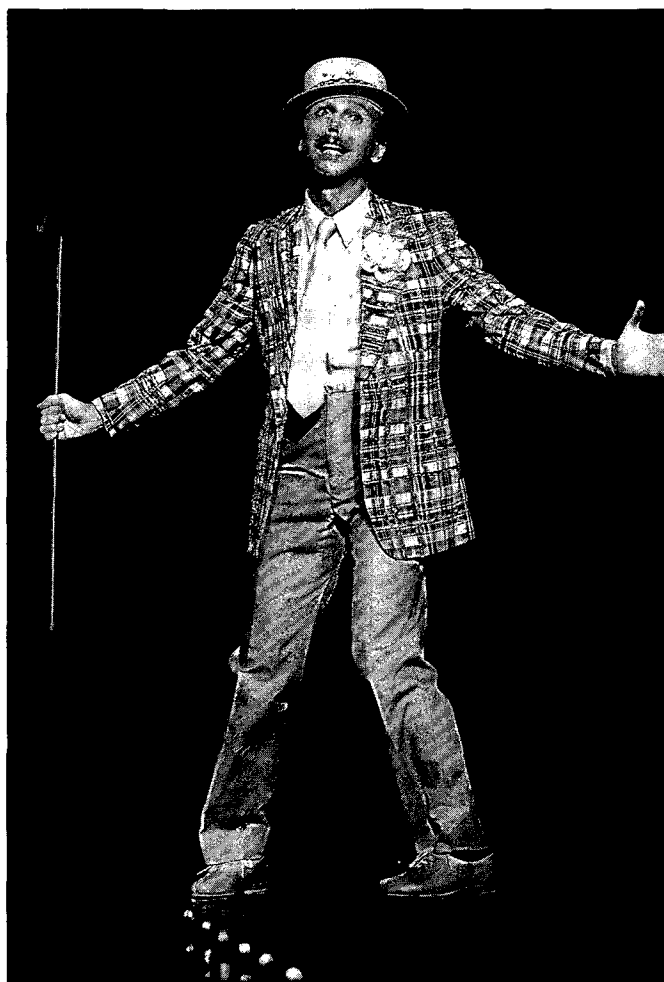
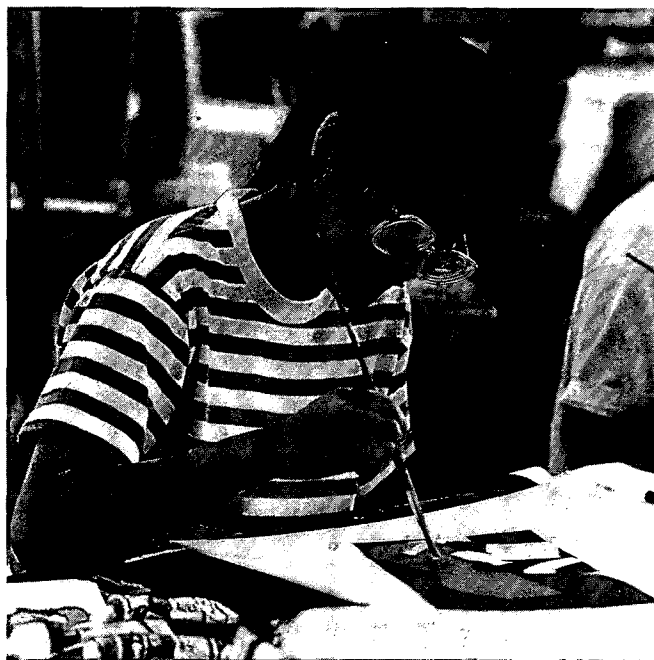
Undergraduate Program

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None

Departmental Requirements: Refer to individual departments



Students in the School of Fine Arts, as well as qualified students from other academic areas, demonstrate their talents in a variety of productions and exhibitions throughout the academic year. The School also sponsors visits by professional guest artists, lecturers, and other distinguished artists and scholars.

Graduate Program

The School of Fine Arts offers programs leading to the Master of Fine Arts degree in Fine Arts with concentrations in Studio Art and Music, to the Master of Fine Arts degree in Dance, and to the Master of Fine Arts degree in Drama. The primary activity of the School of Fine Arts is performance—the creative act. Research activities are concerned with illuminating performance and inspiring the studio experience. The intellectual activity of theoretical, literary, and historical courses complements the practical work in studio workshops and performance. The aim of the program is, thus, to produce literate artists who are responsive to intellectual stimuli, who are capable of integrating knowledge into creative acts, and who are disciplined to the point of freedom. It is the strong belief of the School that intellectual integrity and professional excellence cannot exist without each other.

Admission to the Program

Applications are accepted for fall quarter admission only, and ordinarily must be completed by March 1 as the number of graduate students that can be admitted to the School of Fine Arts is limited. Applicants are advised to arrange for auditions, interviews, and the submission of portfolios, compositions, and dossiers, as appropriate, by March 1. Students applying for scholarships and fellowships should do so by March 1, and are also encouraged to apply for financial assistance through the Financial Aid Office. The School of Fine Arts has a modest number of teaching assistantships available in all areas, and all candidates are automatically reviewed for teaching assistantship positions; the School informs successful candidates by June 1 for the following academic year.

Upon admission to the program the student is assigned an advisor. The student should discuss with this advisor the scope of undergraduate preparation to determine any areas which may need strengthening if full benefit from graduate study is to be derived.

Fine Arts

General Interdisciplinary

Keith Fowler, D.F.A. Yale University, *Chair of General Interdisciplinary Studies, Associate Professor of Drama, and Head of Directing*

The program in general interdisciplinary studies is designed for students who wish to combine the various disciplines in fine arts. Although participation in studio classes is required, the program emphasizes the study of the history, theory, and criticism of the arts in four of the School's departments. The nature of the program provides each student the opportunity to plan a uniquely individual course of study with the approval of an advisor. Because the general interdisciplinary program is designed for students with a strong sense of personal direction and a desire for an academic appreciation of the arts, students wishing to enter the program must submit a statement of purpose to the General Interdisciplinary Studies Committee prior to the quarter in which they intend to declare their major. Admission to the program is based upon the statement of purpose and upon the student's prior record of high academic performance. Upon completion of this program, students will be awarded the B.A. in Fine Arts with General Interdisciplinary as the area of concentration.

The University's Education Abroad Program offers students the opportunity to study abroad. European study centers of particular interest to the Fine Arts (General Interdisciplinary) major which are strong in the history, theory, and criticism of

the arts are located in Vienna, Austria (music, art), Copenhagen, Denmark (medieval studies), Paris, France (French critical thought and film criticism), Göttingen, West Germany (music, archaeology), and Bologna, Italy (music, art, drama). Art courses also are part of the general curriculum in other study centers in France, Hungary, Spain, Israel, and Sweden, in addition to arts courses in English-language study centers in the United Kingdom, Ireland, Australia, New Zealand, Kenya, Ghana, Egypt, and India.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None

Program Requirements

Three one-year surveys in three different areas of the arts selected from History of Western Art 40A-B-C, Dance 90A-B-C, Dance 191A-B-C, Dance 192A-B-C, Drama 40A-B-C, or Music 40A-B-C; nine performance/studio courses (e.g., acting, ballet, drawing, chorus, orchestra); six upper-division courses in the history, theory, and criticism of the arts in at least two areas of the arts; a senior thesis; two years in a single European language at University level (through 2C) or equivalent competence; related courses in disciplines other than fine arts are encouraged.

Sample Program for Freshmen

Fall	Winter	Spring
Survey Course	Survey Course	Survey Course
Studio Course	Studio Course	Studio Course
Foreign Language	Foreign Language	Foreign Language
English and Comparative Literature WR39A	English and Comparative Literature WR39B	English and Comparative Literature WR39C

With the exception of the Fine Arts courses listed below, Fine Arts Interdisciplinary majors choose courses, in accordance with the requirements stated above, from those listed under Art History, Dance, Drama, Music, and Studio Art.

Courses in Fine Arts

40A-B-C Selected Interdisciplinary Topics (4-4-4) F, W, S. Studies in the historic and theoretical interrelationships of artistic disciplines, including such fields as dance, music, art, and/or drama; and investigation of their underlying social and aesthetic bases and the influence of one art upon another. Topics vary.

100A-B-C The Senior Thesis (4-4-4) F, W, S. Planning, drafting, writing, and presentation of an academic thesis which interrelates two or more artistic disciplines. Prerequisite: consent of instructor. Open only to Fine Arts Interdisciplinary majors.

140A-B-C Selected Interdisciplinary Topics (4-4-4) F, W, S. Studies in the historic and theoretical interrelationships of artistic disciplines, including such fields as dance, music, art, and/or drama; an investigation of their underlying social and aesthetic bases and the influence of one art upon another. Topics vary. Prerequisite: upper-division standing.

Department of Art History

Faculty

Hara Georgiou, Ph.D. Bryn Mawr, *Chair of the Department and Associate Professor of Art History (Ancient art)*

Laura Allen, Ph.D. University of California, Berkeley, *Assistant Professor of Art History (Japanese art)*

George Bauer, Ph.D. Princeton University, *Professor of Art History (Renaissance/Baroque art)*

Linda Bauer, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History (Renaissance/Baroque art)*

Ann Bermingham, Ph.D. Harvard University, *Associate Dean of the School of Fine Arts and Associate Professor of Art History* (Modern European art, American art, history of photography)

Anna Gonosova, Ph.D. Harvard University, *Associate Professor of Art History* (Byzantine and Medieval art)

Judy Ho, Ph.D. Yale University, *Assistant Professor of Art History* (Chinese art)

Philip Leider, M.A. University of Nebraska, *Lecturer in Art History* (Modern Art)

The Art History curriculum is designed to provide a comprehensive study of art as a humanistic discipline. The program is concerned with both the formal structure of the visual arts and their function within society. Students majoring in the history of art thus are urged to take appropriate courses in classics, history, literature, and philosophy, as well as in other areas of the fine arts. All majors also are encouraged to study a second language beyond the minimum departmental requirement of two years in a single foreign language at the University level.

The University's Education Abroad Program offers students the opportunity to study abroad. Study centers of particular interest to Art History majors are in Vienna, Venice, Padua, Madrid, Cairo, Jerusalem, Leningrad, Latin America, France, Great Britain, Ireland, and Scandinavia. In addition, students focusing in Asian art may be interested in programs in China, India, Korea, Indonesia, Thailand, or Japan; and Chengchi University in Taipei offers a track in English that is devoted to Chinese art and art history. Special scholarships are available for Pacific region programs.

Careers for the Art History Major

A Bachelor's degree in Art History is excellent preparation for pursuing either a career as an art historian, art conservator, or museum curator, or professional study in an entirely different discipline. Art History majors have gone on to graduate and professional school to study art history, archaeology, architecture, law, library science, business (in some cases with special focus in the fine arts), or teacher education. The study of the history of art is a valuable part of a liberal education that provides a means of looking at the history and culture of both the past and the present.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None.

Departmental Requirements for the Major

Art History 40A-B-C, or 42A-B-C, or any of three courses from Art History 20A, B, C, D, E, F; eight upper-division courses in art history, with a minimum of one course selected from each of the following groupings: Art History 100-109 (ancient history), 110-119 (Medieval history), 120-129 (Renaissance/Baroque history), 130-149 (modern history), and 150-159 (Asian history); Art History 190; two quarters of Art History 198; two years in a single foreign language, either modern or classical (through 2C), that has been approved by the faculty, or equivalent competence; and two Studio Art courses (which may be taken Pass/Not Pass).

Sample Program for Freshmen

Fall	Winter	Spring
Art History 40A	Art History 40B	Art History 40C
Foreign Language	Foreign Language	Foreign Language
English and Comparative Literature WR39A	English and Comparative Literature WR39B	English and Comparative Literature WR39C
Elective	Elective	Elective

Departmental Requirements for the Minor

One year-long introductory sequence (either Art History 40A-B-C or 42A-B-C or any three courses selected from History of Art 20A, B, C, D, E, F); one upper-division course in each of the following course groupings: Art History 100-109 (ancient history), 110-119 (Medieval history), 120-129 (Renaissance/Baroque history), 130-149 (modern history), and 150-159 (Asian history); and one quarter of Art History 198.

Lower-Division Courses in Art History

Lower-division courses are designed to provide the student with a comprehensive introduction to the history of art and the premises upon which such a history is based.

20 History of Art. A two-year survey of the history of art.

20A Prehistoric, Ancient (4) F. (IV)

20B Greek, Roman, Early Christian (4) W. (IV)

20C Christendom (4) S. (IV)

20D Early Renaissance (4) F. (IV)

20E Late Renaissance and Baroque (4) W. (IV)

20F Seventeenth Century and Eighteenth Century (4) S. (IV)

35A-B-C Contemporary Artists (4-4-4) F, W, S. A three-quarter course which explores the issues and artists of contemporary times, with special emphasis on the art of the last 40 years. Twentieth-century art movements such as Cubism, Expressionism, Dada, Surrealism, Constructivism, and Neo-Plastism are examined as precursors of contemporary styles and attitudes. Same as Studio Art 35A-B-C. (IV)

40A-B-C History of Western Art (4-4-4) F, W, S, Summer. A one-year survey of the history of western art from its beginnings to the modern world. (IV)

42A-B-C History of Asian Art (4-4-4) F, W, S. An introductory survey of the arts and architecture of the oriental world including India, Southeast Asia, China, Korea, and Japan. (IV)

46 The Nature of Architecture (4). Selected topics determined by individual faculty members dealing with the development of styles and schools in Western architecture and covering all periods.

Upper-Division Courses in Art History

Upper-division courses in the history of art are intended to expose the student to a wide variety of aims and methods—archaeological, historical, and critical—in the study of art. Topics within a given area may therefore vary from quarter to quarter, and courses may be repeated for credit when this occurs. Art History 40A-B-C (or any three courses from Art History 20A, B, C, D, E, F) is prerequisite for courses numbered from 100 through 149, except for Art History 120 and 130.

100 Studies in Ancient Art (4). Topics in Egyptian, Mesopotamian, and Prehistoric art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek art are also taught.

103 Studies in Greek Art (4) F, W, S. Traces the development of Greek architecture, sculpture, and vase painting from the Prehistoric period through the end of the fifth century B.C. Research on painting and sculpture is related to the collections of the J. Paul Getty Museum of Art.

107 Studies in Roman Art (4) F, W, S. Topics in Hellenistic and Roman art; stresses historical and political background. The collections of the J.P. Getty Museum of Art are used as the basis for research papers.

110 Studies in Early Christian and Byzantine Art (4) F, W, S. Selected topics on the development of the art and architecture of the Later Roman and Byzantine Empires between ca. 300 and 1453. Examples: Early Christian architecture, Byzantine painting.

114 Studies in Western Medieval Art (4) F, W, S. Selected topics on the development of art and architecture in Western Europe between ca. 700 and 1400. Examples: Romanesque painting, Gothic architecture.

118 Studies in Medieval Islamic Art (4) F, W, S. Selected topics on the development of art and architecture between the seventh and fifteenth centuries A.D. (first to ninth centuries A.H.) in the Eastern Mediterranean and the Near East after the rise of Islam.

120 Studies in Southern Renaissance Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Italy and Spain. Examples: the art of Venice, Renaissance architecture.

123 Studies in Northern Renaissance Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Northern Europe. Examples: Late Medieval art, painting from Van Eyck to Bosch.

125 Studies in Southern Baroque Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Italy and Spain. Example: Rome in the seventeenth century.

128 Studies in Northern Baroque Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Northern Europe. Example: from Rubens to Rembrandt.

130 Studies in Eighteenth-Century Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the eighteenth century. Examples: English art, Neoclassicism.

133 Studies in Nineteenth-Century Art (4) F, W, S. Varying topics including Romanticism, Realism, Impressionism, Post-Impressionism, and Symbolism. Individual artists' works are studied in the context of broader cultural and historical movements.

140 Studies in Twentieth-Century Art (4) F, W, S. Varying topics, including Cubism, Futurism, Constructivism, Dada, Surrealism, and Expressionism. Individual artists' works are studied in the context of broader cultural and historical movements.

150 Studies in Asian Art (4) F, W, S. Topics include such major artistic traditions as Japanese narrative painting, Indian sculpture, Chinese ceramics, and gardens of China and Japan.

152 Art and Afterlife (4) F, W, S. A study of the rich archaeological finds in mainland China (including mausolea, wall-paintings, and mortuary objects in bronze, pottery, and jade), and the dissemination of Chinese tomb art in early Korea and Japan.

153 Studies in Early Chinese Painting (4) F, W, S. An examination of major traditions in landscape and figure painting from the fourth through the fourteenth centuries and the parallel developments in art theory.

154 Studies in Later Chinese Painting (4) F, W, S. New developments in the Ming and Qing periods: the Wu and Che Schools, the Orthodox Masters, the Individualists and Eccentrics.

160 Studies in American Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments in Colonial, eighteenth-, nineteenth-, and twentieth-century art. Examples: Colonial architecture, American Modernism.

170 Studies in Primitive Art (4) F, W, S

180 Criticism of Art (4) F, W, S

183 History of Photography (4) F, W, S. Varying topics, including surveys of nineteenth- and twentieth-century photography and of individual photographers and movements. Example: Stieglitz and the Photo-Secession.

190 Practicum for Majors (4) W. Theory and practice of art history with emphasis on formal and social models of analyzing and writing about art. Prerequisite: Art History major, junior standing.

All advanced problems, special studies, and tutorial courses may be repeated for credit.

196 Tutorial in Art History (1-4) F, W, S, Summer. Independent research topics directed by individual faculty members. May be repeated for credit four times.

198 Proseminar in Art History (4) F, W, S, Summer. Discussion and report-oriented seminar with emphasis on reading, writing, and thinking about problems in art history. Topics vary according to the faculty member in charge. Examples: Caravaggio and his followers, Dunhuang painting. Prerequisite: consent of instructor or Art History major.

Department of Dance

Faculty

James Penrod, M.F.A. University of California, Irvine, *Chair of the Department and Professor of Dance* (ballet, modern, dance notation, choreography, movement analysis)

Michael Bokosky, M.A. California State University, Los Angeles, *Assistant Men's Basketball Coach* (weight training for dancers)

Don Bradburn, Columbia Broadcasting System (CBS-TV), *Lecturer in Dance* (ballet, choreography, video choreography)

Patricia Carney, M.F.A. University of California, Irvine, *Lecturer in Dance* (jazz techniques)

Diane Diefenderfer, Soloist, Eglevsky Ballet Company, Frankfurt Ballet Company, Certified Instructor in Pilates Technique, *Lecturer in Dance* (ballet, pointe)

Donna France, A.A. Fullerton College, *Lecturer in Dance* (tap, jazz)

Israel "El" Gabriel, Internationally known teacher, choreographer.

Formerly Assistant Artistic Director, Bat Dor Dance Company of Israel; Artistic Advisor, Montgomery Ballet Company, *Lecturer in Dance* (ballet, modern, pas de deux)

Vance O. Gardner, M.D. Washington University, *Assistant Professor of Surgery, Orthopedic* (back injuries to the dancer)

Clayton Garrison, Ph.D. Stanford University, *Professor of Drama* (tap, musical theatre)

Paul Hodgins, D.M. University of Southern California, Los Angeles, *Assistant Professor of Dance* (music for dancers, choreography, history)

Dianne Howe, Ph.D. University of Wisconsin, Madison, *Assistant Professor of Dance* (philosophy, aesthetics, and criticism, modern dance, choreography, research methods)

Jillana, Principal Dancer, American Ballet Theatre, New York City Ballet, *Lecturer in Dance* (ballet, repertory, pas de deux)

Jim Jones, B.A. University of California, Irvine; Frankfurt Ballet, *Lecturer in Dance* (ballet, repertory, pas de deux, choreography)

Loretta Livingston, B.F.A. California Institute of the Arts, Bella Lewitzky Dance Company, Artistic Director of Loretta Livingston and Dancers, *Lecturer in Dance* (modern)

Raymond W. Novaco, Ph.D. Indiana University, *Associate Professor of Social Ecology* (human stress, performance stress in dance)

Janice Gudde Plastino, Ph.D. University of Southern California, *Professor of Dance* (modern, kinesiology/anatomy, research methods, choreography, dance medicine)

Barbara Bailey Plunk, M.G.M., NBC-TV, *Lecturer in Dance* (ballet, teaching of dance, theory, administration)

Carlos A. Prietto, M.D. University of California, Irvine, *Associate Adjunct Professor of Surgery, Orthopedic* (dance injuries to the hip, knee, ankle, and foot; science of dance research)

Antonia Rojas-Kabakov, Specialist in Flamenco Technique, *Lecturer in Dance* (flamenco)

Larry Rosenberg, B.A. University of California, Los Angeles; Eliot Feld Ballet, *Lecturer in Dance* (ballet, repertory, pas de deux)

Nancy Lee Ruyter, Ph.D. Claremont Graduate School, *Associate Professor of Dance* (dance history, modern dance, ethnic dance, choreography, and research methods)

Kiyooki Terajima, Kuroemon, *Lecturer in Dance and Drama* (Kabuki and modern Japanese theatre)

The Department of Dance is recognized internationally for its leadership in the development of dance in the educational setting. The Department provides students with an educational environment in which performance opportunities,

creative projects, and theoretical studies complement and reinforce each other. The Department prepares students for various professions in the field of dance by providing a curriculum and an atmosphere in which the student may create and perform, analyze, and study dance from historical, philosophical, and scientific perspectives. The program provides studio experience in the knowledge and techniques of classical ballet, contemporary dance, historical dance forms, and selected ethnic dance cultures. Theoretical studies include history; philosophy, aesthetics, and criticism; notation; teaching methods; and dance science.

The traditional technique of classical ballet constitutes a craft and style for the dancer that serves not only as a basis for the logical training of the body, but also as a basic language of movement for the choreographer. While ballet is emphasized, it is balanced by work in other genres. Studio experiences build progressively on the techniques of ballet and extend through the contemporary idioms of modern and jazz as well as through historical and ethnic dance forms. The aim is to develop kinetic resources, precision, flexibility, creativity, and freedom in a coordinated and intelligently responsive dancer.

The theoretical, historical, and scientific courses are designed both to broaden the perspective of those students whose first interest is performance or choreography and to provide a foundation and beginning of training for those students who plan to pursue careers in the academic, scientific, or administrative fields of dance.

Careers for the Dance Major

In addition to excellent training, a career in dance requires extraordinary discipline, tenacity, and dedication. Beyond the perhaps more obvious careers in professional dance performance, choreography, and teaching, the major in Dance also serves as a basis for graduate study or job opportunities in fields such as dance history, dance science, dance reconstruction, dance writing, and dance video. Related fields, such as arts administration, law in relation to the arts, arts therapies, design, and music also offer positions for the individual trained in dance.

Graduates of the Department have an excellent record of placement in the many fields of dance. Some have become professional dancers in ballet companies (including the San Francisco, Frankfurt, and Stuttgart Ballets); in modern dance companies (including the Bella Lewitzky, Lar Lubovitch, and Bat-Dor Companies); and in musical films, television, and theatre. Others have entered the professions of dance education, dance anthropology, medicine, law, and psychology.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None.

Performance Requirements

Students planning to major in dance should develop basic ability in techniques of ballet, modern, and jazz dance forms. Although freshmen entering with fewer than 12 units are not required to audition, a placement examination is offered. The evaluation of the examination indicates the level of ballet, modern, and jazz at which the student is placed. Freshmen declaring the dance major are encouraged to take the placement examination, especially if they feel they could be placed at a higher level than Ballet I, Modern I, and Jazz I. At the end of the freshman year the student should select one of the four major emphases with faculty approval. At the end of the sophomore year, the faculty determines whether the student is making sufficient progress to proceed in their desired emphasis.

All advanced standing applicants (entering students with 12 units or more) to the University who have indicated an interest in majoring in dance are required to audition and will be notified by the School of the date. Evaluations of the student's audition will indicate whether or not the student may major in dance and will indicate the appropriate placement level in ballet and modern for students admitted to the major. This placement level determines the minimum amount of years it will take to complete the degree requirements. Students who wish to be considered for the undergraduate choreography emphasis must show examples of their work, either on videotape or by prearranged audition.

Inasmuch as the level of performance ability generally determines the length of time in study, and all transfer students must anticipate meeting the total performance requirements for the B.A. degree, students deficient in level of performance in comparison to their level of academic study should be prepared to extend their studies in order to meet performance requirements.

Program Requirements

The following program requirements in choreography, history, performance, and teaching are in effect for students entering UCI fall quarter, 1987 and thereafter. Program requirements applying to students who entered prior to fall quarter, 1987 are described in previous editions of the *General Catalogue*.

Choreography Emphasis:

Two years of studio work in advanced ballet (Dance 132A-B-C and 133A-B-C); two years of studio work in advanced modern (Dance 142A-B-C and 143A-B-C); two years studio work in jazz (51A-B-C, 152A-B-C); two quarters in music for dancers (Dance 21A-B); and one quarter in musical theatre workshop (Drama 165); two quarters of dance notation (Dance 80A-B); one year in dance history (Dance 90A-B-C); one quarter in repertory (Dance 137A or 147); one quarter in character dance (Dance 138); one quarter in studio workshop in Spanish dance (Dance 54A), studio workshop in Mexican dance (Dance 55A), ethnic dance (Dance 155), or historical dance (Dance 156); one quarter in injury prevention/technique analysis (Dance 25); one quarter in philosophy, aesthetics, and criticism of dance (Dance 198); one original choreographed work must be presented in Dance Workshop (Dance 171) each year in the junior and senior years; two years in choreography (Dance 60A-B-C, 162A-B-C, or 164A-B-C); one course in acting (Drama 30A); six units in theatre production (Drama 101). Choreography I (Dance 60A-B-C) must be taken in the sophomore year.

Hispanic Dance Emphasis:

Two years of studio work in advanced ballet (Dance 132A-B-C and 133A-B-C), advanced modern (Dance 142A-B-C and 143A-B-C), or advanced jazz (Dance 152A-B-C and 153A-B-C); one year in studio workshop in Spanish dance (Dance 54A-B-C); one year in studio workshop in Mexican dance (Dance 55A-B-C); one year in dance in the Hispanic world (Dance 91A-B-C); three quarters of upper-division studio workshop in Mexican or in Spanish dance (Dance 155 or 170); two courses in independent study in Hispanic dance (one four-unit research and writing project and one four-unit choreographic work for presentation at the undergraduate Dance Workshop Concert, (Dance 197); two quarters of

Dance 193 (when it covers Hispanic dance content); History 42, 126, 138, 160, 161, 163, 169; Spanish 110, 117, 119, 120, 130, 131, 133, 134, 160; Social Sciences 134K, 134L, 134R, 171B; two years of University-level Spanish language training or the equivalent; two courses in music for dancers (Dance 21A-B); one course in injury prevention/technique analysis (Dance 25); two courses in dance notation (Dance 80A-B); one year in dance history (Dance 90A-B-C); two courses in teaching of dance (Dance 111A-B); and six units of production (Drama 101).

History Emphasis:

Two years studio work in ballet (Dance 31A-B-C, Dance 132A-B-C); two years studio work in modern (Dance 41A-B-C, 142A-B-C); two quarters in jazz (51A-B); two courses in music for dancers (Dance 21A-B); one course in injury prevention/technique analysis (Dance 25); one course in choreography (Dance 60A); two courses in historical dance (Dance 156); two courses in dance notation (Dance 80A-B); two years in dance history (Dance 90A-B-C and either 191A-B-C or 192A-B-C); one course in philosophy, aesthetics and criticism (Dance 198); one quarter in studio workshop in Spanish dance (Dance 54A-B-C), studio workshop in Mexican dance (Dance 55A-B-C) or ethnic dance (Dance 150, 151, or 155); one course in choreography (162A or 164A); two courses in senior thesis (Dance 199); two units in theatre production (Drama 101); one course in the history of art (Art History 40A-B-C); and three additional courses chosen from the following: Art History 40A-B-C, Music 40A-B-C, or Drama 105A-B.

Performance Emphasis:

Two years of studio work in advanced ballet (Dance 132A-B-C and 133A-B-C); two years of studio work in advanced modern (Dance 142A-B-C and 143A-B-C); one additional year of studio work in advanced ballet (Dance 134A-B-C) or in advanced modern (Dance 144A-B-C); two years of studio work in advanced jazz (Dance 152A-B-C and 153A-B-C); one course in musicality and dance (Dance 23); one course in tap (150 or 151); one course in pas de deux partnering (Dance 139); one course in repertory (Dance 137A or 147); one quarter in studio workshop in Spanish dance (Dance 54A-B-C), studio workshop in Mexican dance (55A-B-C), ethnic dance (Dance 155), historical dance (Dance 156), or Kabuki and modern Japanese theatre (Dance 158); two courses in music for dancers (Dance 21A-B); one course in choreography (Dance 60A); one course in the philosophy, aesthetics, and criticism of dance (Dance 198); two courses in dance notation (Dance 80A-B); one year in dance history (Dance 90A-B-C); one course in kinesiology for dance (Dance 100); one course in injury prevention/technique analysis (Dance 25); one course in acting (Drama 30A); one course in musical theatre workshop (Drama 165); six units in theatre production (Drama 101); performance in one faculty concert (Dance 170), two M.F.A. performances (Dance 172), two undergraduate dance workshops (Dance 171), the UCI Dance Ensemble (Dance 174), and the UCI Dance Touring Ensemble (Dance 175). (Students must demonstrate proficiency in at least two dance forms in these performances.)

Teaching Emphasis:

Two years of studio work in advanced ballet (Dance 132A-B-C and 133A-B-C); two years of studio work in advanced modern (Dance 142A-B-C and 143A-B-C); two years studio work in jazz (51A-B-C, 152A-B-C); two courses in music for dancers (Dance 21A-B); one year in choreography (Dance 60A-B-C); two quarters in dance notation (Dance 80A-B); one course in dance accompaniment (Dance 123); one year in dance history (Dance 90A-B-C); one course in kinesiology for

dance (Dance 100); one course in philosophy, aesthetics, and criticism of dance (Dance 198); one course in injury prevention/technique analysis (Dance 25); two courses in teaching of dance (111A-B); one course in musical theatre workshop (Drama 165); one quarter in studio workshop in Spanish dance (Dance 54A-B-C), studio workshop in Mexican dance (Dance 55A-B-C), or ethnic dance (Dance 150, 151, or 155); six units in technical theatre (Drama 101); and work as an assistant in a technique class for one quarter (work must be approved by the student's faculty advisor).

Sample Program for Freshmen

Fall	Winter	Spring
Dance 31A	Dance 31B	Dance 31C
Dance 41A	Dance 41B	Dance 41C
English and Comparative Literature WR39A	English and Comparative Literature WR39B	English and Comparative Literature WR39C
Breadth	Breadth	Breadth
Breadth	Breadth	Breadth

Program Requirements for the Minor

Dance 21A (Music for Dancers); Dance 90A, 90B, 90C (History of Dance); Dance 100 (Kinesiology for Dance); Dance 132A-B-C (Studio Workshop in Ballet II); Dance 142A-B-C (Studio Workshop in Modern II); one course selected from Dance 150 (Studio Workshop in Tap I), Dance 151 (Studio Workshop in Tap II), Dance 155 (Ethnic Dance), two to four units selected from Dance 170 (Dance Performance), Dance 171A-B-C (Dance Workshop), or Dance 172 (Master of Fine Arts Concert).

Residency Requirement for the Minor: A minimum of four of the upper-division courses for the minor must be taken at UCI.

Master of Fine Arts Program

Degree Offered

M.F.A. in Dance, with emphasis in choreography, history and research, or teaching and administration.

Admission

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A. or B.F.A. Candidates must meet the minimum requirements for the B.A. degree in Dance at the Irvine campus of the University of California. A paper of 500 words or more on a dance subject and proposals for three choreographic works that could be completed in the graduate program must be submitted for the file. Proof of practical ability in ballet, modern, and other dance forms must be provided by personal audition on the announced date in Winter Quarter. Also on this date, applicants must present a prepared five-minute choreographed piece: a solo performed by the applicant and/or a work for a small group. Interviews with faculty are conducted following the audition.

Teaching Assistantships

Graduate students are encouraged to apply for teaching assistantships in areas such as notation, dance medicine, history, music for dancers, choreography, ethnic, and all technique classes. Students with expertise in any of these areas are given special consideration.

General Degree Requirements

Normally two years of residence are required. Each candidate must enroll for three courses each quarter for six quarters, exclusive of summer sessions. Each student is accepted into an approved emphasis.

In the second year, satisfactory attainment must be demonstrated by a major thesis: in choreography this consists of the composition and production of a choreographic work; in teaching this consists of a practical and comprehensive project concerned with the teaching of dance. For the history and research emphasis, a written thesis in a chosen area of research must be prepared. This thesis is to be defended in a one-hour oral examination which may also test the candidate's general knowledge in the area.

Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. Not more than 20 units in upper-division courses may count toward the degree. Fulfillment of the technique course requirements must be approved by the faculty advisor. All graduate students in Dance are required to take one production-running crew assignment each year they are in residence.

Choreography Emphasis:

One course in teaching of dance (Dance 211); six courses chosen from any graduate or upper-division technique course; one year of graduate choreography (Dance 261A-B-C); two courses in graduate projects/productions (Dance 240); one course in movement analysis and notation (Dance 280); one course in philosophy, aesthetics, and criticism (Dance 291); one quarter in video choreography (Dance 264); one course in choreographic resources (Dance 292); one course in musical resources (Dance 221); one course in thesis (Dance 260); one course in ethnic dance (Dance 155) or historical dance (Dance 156); one course in technical theatre (Drama 101); one course in proseminar in dance history (Dance 296); and one elective course chosen with the consent of the graduate advisor.

For the choreography emphasis, graduate projects choreographed in residence (new and original) are to consist of the production of one group work and one solo piece in the first year, and a major work in the second year. Additionally, a work or work-in-progress must be presented at six quarterly choreography/repertory workshop performances. The thesis is a philosophical argument supporting the second year's choreographic production.

History and Research Emphasis:

Six courses chosen from any graduate or upper-division technique courses; one course in graduate project/production (Dance 240); one course in movement analysis and notation (Dance 280); one course in bibliography and research (Dance 290); one course in philosophy, aesthetics, and criticism (Dance 291); two courses in thesis (Dance 260); one course in choreographic resources (Dance 292); one course in musical resources (Dance 221); one course in dance and related arts (Dance 293); one course in period and style (Dance 294); one course in ethnic dance (Dance 155) or historical dance (156); one course in proseminar in dance history (Dance 296); and three elective courses chosen with the consent of the graduate advisor.

For the history and research emphasis, research skills and writing ability are required. Students in this emphasis write an historical research or critical thesis or produce a concert based on historical treatise material supported by a smaller written work.

Teaching and Administration Emphasis:

One course in kinesiology (Dance 201); one course in teaching of dance (Dance 211); one course in administration and management (Dance 212); one course in musical resources (Dance 221); six courses chosen from any graduate or upper-division technique course; one course in graduate choreography (Dance 261A, 261B, or 261C); one course in graduate project/production (Dance 240); one course in movement analysis and notation (Dance 280); one course in bibliography and research (Dance 290); one course in period and style (Dance 294) or in dance and related arts (Dance 293); one course in thesis (Dance 260); one course in technical theatre (Drama 101); one course in proseminar in dance history (Dance 296); one course in philosophy, aesthetics, and criticism (Dance 291); and two elective courses normally chosen from upper-division or graduate dance courses.

For the teaching and administrative emphasis, graduate projects will consist of, in the first year, experience in the field with a supporting paper and/or experience in administration. In the second year, a major thesis is required that presents an in-depth study of some aspect of dance education.

Lower-Division Courses in Dance

NOTE: Some courses are not offered every year. Please check with the department advisor.

20A-B-C Theories of Dance (4-4-4) F, W, S. Ballet and modern technique analysis and its relationship to selected choreographers and ballets for two quarters. Principles and applications of kinesiology and anatomy for one quarter. Open only to students enrolled in workshop courses.

21A-B Music for Dancers (4-4). Music fundamentals, analysis, and a survey of historical styles and forms; working with live and recorded music.

22 Studio Tutorial in Music for Dancers (1-4) F, W, S. Advanced instruction in music for dance. Prerequisites: Dance 21A-B. May be repeated for credit once.

23 Musicality and Dance (2). Developing listening skills and music movement coordination; analyzing the problems of live and recorded musical accompaniment. Prerequisite: Dance 21A-B. Studio class.

25 Injury Prevention/Technique Analysis (2). The analysis, management, and prevention of dance injuries. Analysis of body types and technical ability and the means by which to improve dance ability.

30A-B-C Studio Workshop in Ballet I (2-2-2) F, W, S, (30) Summer. Beginning ballet: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Pass/Not Pass only.

31A-B-C Studio Workshop in Ballet I (2-2-2) F, W, S, (31) Summer. Beginning ballet: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Open to Dance majors or nonmajors by audition. May be repeated for credit.

34 Men's Studio Workshop in Ballet (2) F, W, S. Emphasis on men's traditional ballet, techniques, and movements. Prerequisites: Dance 31A-B-C. May be repeated for credit.

40A-B-C Studio Workshop in Modern I (2-2-2) F, W, S, (40) Summer. Beginning modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman. Pass/Not Pass only.

41A-B-C Studio Workshop in Modern I (2-2-2) F, W, S, (41) Summer. Beginning modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman. Open to Dance majors or nonmajors by audition. May be repeated for credit.

44 Weight Training for Dancers (.7). Principles and theories of weight training specifically designed for the dancer. Special programs are devised to strengthen problem areas in the dancer's body.

50A-B-C Studio Workshop in Jazz I (2-2-2) F, W, S. (50) Summer. Beginning jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor. Prerequisites: Dance 40A-B-C. Pass/Not Pass only.

51A-B-C Studio Workshop in Jazz I (2-2-2) F, W, S. Beginning jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor. Prerequisites: Dance 40A-B-C. Open to Dance majors or nonmajors by audition. May be repeated for credit.

54A-B-C Studio Workshop in Spanish Dance (2-2-2) F, W, S. Principles of Spanish dance with focus on basic movement techniques, castanet work, and introduction to the genres of flamenco, folk, classical, and neoclassical dance forms. May be repeated for credit.

55A-B-C Studio Workshop in Mexican Dance (2-2-2) F, W, S. Principles of Mexican folk dance including basic movement techniques, rhythms, regional dance forms and styles, and cultural context. May be repeated for credit.

56A-B-C Social Dance Forms (2-2-2). Contemporary and historical forms. **56A:** Current ballroom, disco, and Western square dance forms; **56B:** Latin ballroom dances; **56C:** Dances from the 20s, 30s, and 40s. May be repeated for credit once.

60A-B-C Choreography I (4-4-4) F, W, S. Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

80A-B-C Dance Notation (4-4-4) F, W, S. Beginning-to-intermediate principles of Labanotation, score reading, and dictation for two quarters. Principles of Labanotation, movement analysis, and selected other notation systems for one quarter. Prerequisite: one year in a studio workshop course.

90A Dance History IA (4) F. Introduction to the history of dance from prehistory through the Middle Ages. (IV)

90B Dance History IB (4) W. The history of dance in the western tradition from the Renaissance through the eighteenth century. (IV)

90C Dance History IC (4) S. The history of dance in the western tradition: the nineteenth and twentieth centuries. (IV)

91A-B-C Dance in the Hispanic World (4-4-4) F, W, S. History and current state of Hispanic dance with particular attention to Spain and Mexico. **91A:** Dance traditions in Spain and her colonies to 1898. **91B:** Ritual, folk and social dance genres: twentieth-century survivals and developments. **91C:** Theatrical genres: adapted folk and social dance; ballet; modern. (IV)

Upper-Division Courses in Dance

100 Kinesiology for Dance (4). The study of the production of dance movement or lack of dance movement by the muscles of the body. Anatomical and dynamic analysis of dance movement.

101 Anatomy for Dance (4) F, W, S, Summer. Survey of human anatomy for dance majors. Covers basic principles of human anatomy, including survey of the tissues, organ system, principal anatomical features. Emphasis on musculoskeletal system and its application to dance.

102 Screening of the Dancer (4) F, W, S, Summer. Methods and analyses of the preparticipation physical screening of the dancer to improve performance and identify possible injury and physical problems before extensive dance performance. Prerequisites: Dance 100 and 101.

111A-B Teaching of Dance (4-4) W, S. 111A: Pedagogy. The pedagogy and theory of teaching dance forms. **111B:** Practicum. The application of theory in the studio.

114 Field Study in the Teaching of Dance (2). Students teach eight classes off campus in supervised situations. Requires an accompanying paper documenting the field experience. Prerequisites: Dance 111A-B; consent of instructor.

121 Music for Dance in Western Cultures (4-4). Historical survey of dance music in Europe and America, to examine all major stylistic periods. Discussion of ethnic and regional influences. Analysis of Lully, Tchaikovsky, Stravinsky, Glass, and other significant dance

composers. Examination of the relationship between score and choreography.

122 Music for Dance in Eastern Cultures (4). Dance music of various cultures including Indian, China, Japan, Korea, Bali, Java. Study of specific instruments and instrumental consorts; indigenous musical forms and their influence on dance, rhythmic melodic, and harmonic structures; and the dances' sociological implications.

123 Dance Accompaniment (4). Examination of technique and etiquette of instrumental accompaniment for dance in lecture and studio environments. Keyboards, percussion, and other instruments are demonstrated. Prerequisites: Dance 21A-B.

130A-B-C Pointe Class (2-2-2) F, W, S, (130) Summer. Intermediate pointe work; principles of Classical tradition developed from Noverre, Petipa, and Cecchetti. Emphasis on basic pointe techniques and performance styles. Prerequisites: Dance 132A-B-C. May be repeated for credit.

131 Studio Workshop in Renaissance Dance I (2-2-2). Beginning class in Renaissance court dance as described by Thoinot Arbeau in his *Orchesographie* (1588).

132A-B-C Studio Workshop in Ballet II (2-2-2) F, W, S, (132) Summer. Intermediate ballet and beginning pointe work: principles of Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 31A-B-C or audition.

133A-B-C Advanced Studio Workshop in Ballet III (2-2-2) F, W, S, (133) Summer. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 132A-B-C or audition.

134A-B-C Advanced Studio Workshop in Ballet IV (2-2-2) F, W, S, (134) Summer. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 133A-B-C or audition.

135A-B-C Advanced Studio Workshop in Ballet V (2-2-2) F, W, S. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 134A-B-C or audition.

136 Studio Tutorial in Ballet (2) F, W, S. Advanced instruction in ballet technique. Prerequisites: Dance 133A-B-C or consent of instructor. May be repeated for credit.

137A-B-C Ballet Repertory (2-2-2) F, W, S. Rehearsal and performance of repertoire from established ballets for three quarters. Studio and public performances presented quarterly. Prerequisites: Dance 132A-B-C. May be repeated for credit.

138 Character Dance (1). A dance style mainly based upon the national traditions of the Polish, Russian, and Hungarian dance techniques as used in classical ballet repertoire. Character or jazz shoes required. Prerequisites: Dance 31A-B-C. May be repeated for credit.

139 Pas de Deux/Partnering (2). Principles of partnering techniques as used in the ballet and other dance performance styles. May be repeated for credit. Prerequisites: Dance 133A-B-C or by audition.

142A-B-C Studio Workshop in Modern II (2-2-2) F, W, S, (142) Summer. Intermediate modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal point of view of the instructor. Prerequisites: Dance 41A-B-C.

143A-B-C Advanced Studio Workshop in Modern III (2-2-2) F, W, S, (143) Summer. Advanced modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal view of the instructor. Prerequisites: Dance 142A-B-C.

144A-B-C Advanced Studio Workshop in Modern IV (2-2-2) F, W, S. Advanced modern dance. In-depth study of styles, performance elements and principles of modern dance developed from Graham, Horton, Humphrey, Wigman, and current influences incorporating the personal view of the instructor. Prerequisite: Dance 143A-B-C or consent of instructor.

146 Studio Tutorial in Modern (2) F, W, S. Advanced instruction in modern dance technique. Prerequisites: Dance 143A-B-C or consent of instructor. May be repeated for credit.

147 Modern Dance Repertory (2). Rehearsal and performance of repertoire from established modern dance choreographers; i.e., Lewitzky, Graham, Limon, Humphrey, and others. Studio and public performances presented quarterly. Prerequisites: Dance 142A-B-C. May be repeated for credit.

148 Improvisation (2). Structured and experiential improvisation to heighten the personal intuitive processes, the kinesthetic sense, spatial and temporal awareness, and to encourage insights into the potential movement resources of the individual for performance and choreography. Course encourages freedom of exploration. May be repeated for credit.

150 Studio Workshop in Tap I (2). Beginning tap: principles of rhythm and basic tap steps.

151 Studio Workshop in Tap II (2). Intermediate tap: principles of beginning tap continued and developed. May be repeated for credit. Prerequisite: Dance 150.

152A-B-C Intermediate Studio Workshop in Jazz II (2-2-2) F, W, S. Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor. Prerequisites: Dance 51A-B-C.

153A-B-C Advanced Studio Workshop in Jazz III (2-2-2) F, W, S. Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor. Prerequisites: Dance 152A-B-C.

154A-B-C Advanced Jazz: Performance Techniques IV (2-2-2) F, W, S. Advanced jazz emphasizing performance techniques. Prerequisites: Dance 153A-B-C. May be repeated for credit.

155 Ethnic Dance (2). Studio workshop of dances and movement sources of specified countries or areas. May be repeated for credit.

156 Historical Dance (2-2-2). Style, technique, and theory of historical dance forms. Basic theory of dance notation. Performance of a complete dance required.

157 Studio Tutorial in Jazz (2) F, W, S. Advanced instruction in jazz styles and techniques. Prerequisites: Dance 153A-B-C or consent of instructor. May be repeated for credit.

158 Kabuki and Modern Japanese Theatre (4). Movement and exercise for training the Kabuki actor; survey of Japanese theatre, Japanese culture, and Kabuki makeup.

159 Mime (1). Combination of vocabulary and instruction in improvisatory mime as well as conventional mime gesture used in the classical ballet repertory.

162A-B-C Choreography II (4-4-4) F, W, S. Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances. By audition only. Prerequisites: Dance 60A-B-C.

163A-B-C Choreography III (4-4-4) F, W, S. Directed choreographic projects. May include choreography for groups. Projects may be presented in public concert. Prerequisites: Dance 162A-B-C.

164A-B-C Video Choreography (4-4-4) F, W, S. Introduction and overview of video dance, choreography for the camera, and documentation of existing stage choreography. History and aesthetics of dance on video and basics of technical equipment, video techniques, and editing. A major final project is required.

168 Studio Tutorial in Choreography (4-4-4) F, W, S. Prerequisites: Dance 163A-B-C.

170 Dance Performance (1-4). Rehearsal and performance in a faculty-choreographed production. By audition only. May be repeated for credit once. Pass/Not Pass or Satisfactory/Unsatisfactory only.

171A-B-C Dance Workshop (1-4) F, W, S. Rehearsal and performance in a student-choreographed production. By audition only. May be repeated for credit once. Pass/Not Pass or Satisfactory/Unsatisfactory only.

172 Master of Fine Arts Concert (1-4). Rehearsal and performance in a graduate student-choreographed production. By audition only. May be repeated for credit twice. Pass/Not Pass or Satisfactory/Unsatisfactory only.

173 Composer-Choreographer Workshop (2). Choreographers and composers collaborate under the supervision of dance and music faculty to produce a work for the Dance Workshop Concert. Prerequisite: consent of instructor. May be repeated for credit.

174 UCI Dance Ensemble Performance (1-4). Performance with the UCI Dance Ensemble. Prerequisite: consent of instructor. May be repeated for credit. Pass/Not Pass or Satisfactory/Unsatisfactory only.

175 Dance Touring Ensemble (1-4). Student performance group tours Northern and Southern California for 10 to 14 days. All forms of dance are utilized in a lecture/performance format. Faculty-directed, student/faculty choreographed. Prerequisite: audition, consent of instructor. May be repeated once. Pass/Not Pass or Satisfactory/Unsatisfactory only.

191A-B-C History of World Dance (Specified Areas from Prehistoric to Contemporary) (4-4-4) F, W, S. Offered alternate years with Dance 192A-B-C.

192A-B-C History of Theatre Dance (Specified Areas from Neoclassical and Modern) (4-4-4) F, W, S. Offered alternate years with Dance 191A-B-C.

193 Selected Topics in Dance (1-4). Directed group studies of topics in dance. May be repeated for credit when topic changes.

194 Tutorial in History of Dance (4). May be repeated for credit.

195 Tutorial in Dance Notation (4). May be repeated for credit.

197A-B-C Independent Study (1-4) F, W, S. Individual independent projects in, e.g., experimental laboratory, library, field, performance, under instructor's direction. Students can receive conceptual, creative, and theoretical instruction in the successful completion of a written report or performance. Prerequisite: consent of instructor. May be repeated for credit.

198 Philosophy, Aesthetics, and Criticism of Dance (4). Introduction to the aesthetics and philosophy of Dance. Based upon this foundation, principles and application of criticism are applied to dance performances. Prerequisites: Dance 90A, 90B, 90C.

199 Senior Thesis (4-4-4) F, W, S. Directed research for senior Dance majors focusing on dance history. Research consists of a substantial essay on dance history. A reconstructed performance may be required. Pass/Not Pass only.

Graduate Courses in Dance

201 Seminar in Kinesiology for Dance (4-4-4-4-4) F. Brief introduction to biomechanics, physiology of exercise and equipment, movement principles, and their application to dance techniques. Prerequisite: Dance 290.

202 Seminar in Dance Medicine (1-4). Survey of dance medicine literature and research. Discussion of current developments in the field. Prerequisite: consent of instructor. May be repeated for credit.

211 Seminar in the Teaching of Dance Techniques (4-4). Principles and theories of teaching dance techniques. Supervised presentation and teaching of technique class.

212 Administration and Management: Dance (4). Introduction to practice and theory of administration of dance companies, dance departments, and dance schools.

221 Musical Resources (4). Detailed study of music as it relates to dance. An historical overview of musical form, style, and other elements. Analysis of various affinities between music and dance. Practical applications. Prerequisite: Dance 21A-B.

231A-B-C Graduate Studio: Ballet (2-2-2) F, W, S. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. By audition only. May be repeated for credit.

240 Graduate Projects (4-4-4-4-4-4). Projects may be educational, choreographic, scientific, historical, or philosophical in scope and must have faculty advisor approval.

241A-B-C Graduate Studio: Modern (2-2-2) F, W, S. Advanced modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal view of the instructor. By audition only. May be repeated for credit.

251A-B-C Graduate Studio: Jazz (2-2-2) F, W, S. Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor. By audition only. May be repeated for credit.

260 Thesis (4-4-4-4). Substantial research in a topic approved by the student's graduate committee. Results of the research must be written in approved thesis style. Prerequisite: consent of department.

261A-B-C Graduate Choreography (4-4-4) F, W, S. Review of basic principles of composition based on Noverre, Horst, and Humphrey. Overview of new trends and methods. Major thrust is on creation of several works based upon movement studies. May be repeated for credit.

264 Video Choreography (4). Directed choreographic projects for the video camera. Video techniques which create the hybrid art form called video dance. Production of an individual video choreography project. Prerequisites: Dance 164A-B-C.

280 Seminar in Dance Notation and Movement Analysis (4). Theories and application of dance notation, movement analysis, and non-verbal communication.

281 Seminar in Theories of Dance (4). Directed research projects. Prerequisite: consent of instructor.

290 Bibliography and Research (4) F. Survey of dance literature; research styles for writing in dance publications. May be repeated for credit.

291 Philosophy, Aesthetics, and Criticism (4-4). Discussion of aesthetics and philosophy as they specifically apply to dance. Advanced critical skills are presented. Written critiques of concerts and performances are required. Prerequisite: Dance 290.

292 Choreographic Resources (4). A core course of studies centered on the investigation of choreographic resources in art, drama, literature, and poetry, from the classical into the contemporary traditions. Students must satisfy choreographic assignments drawn from drama, opera, and other theatrical sources. May be repeated for credit.

293 Dance and Related Arts (4). A core course of study on the natures of the performing arts, with particular relevance to the relationship between dance and its sister arts. May be repeated for credit.

294 Period and Style: Studio Workshop (4). Advanced studies in the theory, history, style, and technique of one of the following periods of Western dance: Medieval, Renaissance, Baroque, or nineteenth-century. May be repeated for credit.

295 Graduate Lectures in Dance (1-4). A series of lectures and discussions of announced topics in dance. Content may be from history, ethnology, notation, medicine, music, or other areas in the field. May be repeated for credit as topics change. Prerequisite: consent of instructor.

296 Proseminar in Dance History (4). Discussion seminar with emphasis on reading and thinking about problems in dance history; presentation of oral and written reports. Topics vary. Prerequisite: Dance 290. May be repeated for credit.

297 Directed Reading (1-4). Topic to be approved by instructor. Paper required. Prerequisite: consent of instructor. May be repeated for credit.

399 University Teaching (1-4). Limited to Teaching Assistants. Prerequisite: consent of instructor. May be repeated for credit.

Stuart Duckworth, M.F.A. University of California, Irvine, *Lecturer in Drama* (acting, dramatic literature, dramaturgy)

Keith Fowler, D.F.A. Yale University, *Associate Professor of Drama, Head of Directing, and Chair of General Interdisciplinary Studies* (acting and dramatic literature)

Clayton Garrison, Ph.D. Stanford University, *Professor of Drama* (opera and musical theatre, movement, dramatic literature)

Douglas S. Goheen, Ph.D. University of Denver; M.F.A. Yale University, *Associate Professor in Drama* (scenery, costume design, and history of design)

Jerzy Grotowski, Polish Laboratory Theatre, *Lecturer in Drama* (objective drama)

Cameron Harvey, M.F.A. University of California, Irvine, *Associate Dean of the School of Fine Arts, Professor of Drama, and Head of Theatre Design* (lighting design, production)

Eric Kline, M.A. San Francisco State University, *Lecturer in Drama* (television acting)

Dudley Knight, M.F.A. Yale University, *Lecturer in Drama* (voice, speech for actors)

William E. Lewis, M.F.A. University of California, Irvine, *Lecturer in Drama* (makeup design)

Larry Lott, M.F.A. University of Pittsburgh, *Lecturer in Drama* (auditions)

Peter Maradudin, M.F.A. Yale University, *Lecturer in Drama* (lighting design)

David McDonald, Ph.D. Stanford University, M.F.A. Yale University, *Associate Professor of Drama* (critical theory)

Elizabeth Novak, M.F.A. University of California, Riverside, *Assistant Professor of Drama* (costume design)

Jerry Patch, South Coast Repertory Theatre, *Lecturer in Drama* (dramatic literature, dramaturgy)

Thomas Ruzika, M.F.A. University of California, Irvine, *Lecturer in Drama* (lighting design, production management)

Mahlon Schanzenbach, M.A. California State University, Long Beach, *Lecturer in Drama* (voice)

Eli Simon, M.F.A. Brandeis University, *Assistant Professor of Drama* (acting, directing)

Kiyoaki Terajima, Kuroemon, *Lecturer in Drama and Dance* (Kabuki and modern Japanese theatre)

Franco Tonelli, Ph.D. Louisiana State University; Laurea, University of Catania, *Professor of Film Studies and Drama* (dramatic literature, film theory, and criticism)

Richard Triplett, Otis Art Institute, *Professor of Drama* (scenery and costume design, history of design)

Christopher Villa, Oregon Shakespeare Festival, *Lecturer in Drama* (stage combat)

The program leading to the Bachelor of Arts in Drama provides the professional training and the liberal study essential to attaining the highest standards in theatre. Each major in drama experiences exacting and rigorous training in the mutually interrelated areas of the theatre: performance, design and production, literature, history, and criticism. The curriculum constantly relates studio practices, technical resources, and production techniques to the development of dramatic literature and current critical theory.

The program is designed for students preparing to continue professionally as actors, directors, designers, stage managers, critics, and teachers, as well as for students who, while not planning to make the theatre their vocation, have a serious interest in the literature, theory, and practice of drama.

Department of Drama

Faculty

Robert Cohen, D.F.A. Yale University, *Chair and Professor of Drama* (acting, directing, dramatic literature)

Keith Bangs, M.F.A. Yale University, *Lecturer in Drama* (technical production)

Stephen Barker, Ph.D. University of Arizona, *Assistant Professor of Drama*

Dennis Castellano, M.F.A. University of California, Irvine, *Lecturer in Drama* (music theatre)

Careers for the Drama Major

A degree in Drama may or may not lead to professional employment in theatre or films. A professional career demands, in addition to excellent training, great talent, great dedication, and not a little bit of luck—intangibles no drama program can promise or even imply.

Graduates in Drama at UCI have performed in Broadway plays, regional and summer theatres, and in films and television. They serve as artistic directors, designers, art directors, business managers, and performers at more than 100 theatre companies, and as faculty at more than 75 institutions of higher learning.

Not all Drama students become professional theatre artists. Many embark upon careers in law, business, arts management, advertising, and teaching; others pursue further study earning the Master of Fine Arts degree at UCI or elsewhere.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None.

Departmental Requirements for the Major

One year survey in the development of dramatic literature (Drama 40A-B-C); one year in acting (Drama 30A-B-C); three courses in design (Drama 50A-B-C); one course in makeup (Drama 153); an introductory course in production theory (Drama 10); two upper-division courses in dramatic literature; six upper-division courses in addition to the two in dramatic literature mentioned above (these may be in studio work and/or dramatic literature, playwriting, and criticism); two quarters in dance (these courses may be taken on Pass/Not Pass); two quarters of theatre production (Drama 101).

Sample Program for Freshmen

Fall	Winter	Spring
Drama 30A	Drama 30B	Drama 30C
Drama 40A	Drama 40B	Drama 40C
English and Comparative Literature WR39A	English and Comparative Literature WR39B	English and Comparative Literature WR39C
Elective	Elective	Elective

Departmental Requirements for the Minor

Drama 10 (Introduction to Production Theory); Drama 30A-B-C (Acting); Drama 40A-B-C (Development of Drama); four upper-division courses in drama, each of which must be taken at UCI, including one course in Drama 101 (Theatre Production).

Master of Fine Arts Program

Degree Offered

M.F.A. in Drama, with emphasis in acting, directing, design and production, or music theatre.

Admission

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A., B.F.A., or higher degree.

Applicants must submit dossiers of biographical information and theatrical experience, together with photographs, essays, reviews, production books, and portfolios, as appropriate.

Normally an audition is required for all applicants who intend to follow the curriculum in acting or music theatre. UCI coordinates its auditions with the University/Resident Theatre Association (U/RTA), and conducts auditions, both for U/RTA finalists and UCI applicants, in New York, Chicago,

Long Beach, and in Irvine during February. Interviews for applicants in directing are also required; for applicants in design and production, interviews are strongly recommended.

General Degree Requirements

Normally three years of residence is required. Each candidate must enroll for three courses each quarter for nine quarters, exclusive of summer sessions.

During the first year of residence each candidate will prepare, for credit, two graduate projects, in either acting, directing, design, stage management, theatrical research, or a combination of two of these. Satisfactory completion of these projects, as determined by the faculty, is prerequisite to entering the second year of the program.

The required thesis normally consists of directing, designing, stage managing, or playing a principal role in a major production, and collecting in essay form the evidences of research, analysis, and judgments which formed a part of the production experience.

Each graduate student is expected to participate in productions throughout residence at UCI.

In addition, acting and music theatre students must take one production-running crew assignment in their first year of residence.

One hundred eight quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B- in each course. Specific course requirements must be satisfied in one of the following four areas:

Acting

Nine graduate studios in acting (Drama 200), taken in tandem with nine graduate studios in voice (Drama 201), stage speech (Drama 202), and stage movement (Drama 203) or stage combat (Drama 204A-B). Three master classes in acting, objective drama, or music theatre (Drama 219, 289, 216, or 135)

One seminar in script analysis and research (Drama 235)

Two courses in history of theatre (Drama 105A-B)

Two seminars in dramatic literature, performance theory, criticism, history of theatre, or contemporary theatre (Drama 220-223, 225, or 230)

Six graduate projects, of which two may be professional internships (Drama 240 or 295)

Design and Production

Nine graduate studios in design, one of which is the thesis (Drama 255)

Seven courses in graduate projects (Drama 240)

Three courses in production theory (Drama 150-159)

Two courses in history of theatre (Drama 105A-B)

Two courses in history of design and production (Drama 120 A-B)

One course in directing (Drama 170)

One course in production management (Drama 171)

One seminar in script analysis and research (Drama 235)

One seminar in conceptualization and collaboration (Drama 245)

Directing

- Nine graduate studios in directing (Drama 211)
- Two courses in history of theatre (Drama 105A-B)
- Three courses in acting (Drama 210, 130A-B, or 135 as qualified)
- One seminar in script analysis and research (Drama 235)
- Two seminars in dramatic literature, performance theory, criticism, theatre history, contemporary theatre, or conceptualization and collaboration (Drama 220-223, 230, or 245)
- One course in production management (Drama 171)—must be taken the first quarter in residence
- One seminar in contemporary theatre (Drama 230)
- Seven projects, of which one is the thesis, one a professional internship, and one a project in stage management or theatre production (Drama 240, 295)
- One elective

Music Theatre

- Nine courses in graduate music theatre (Drama 216)
- Three courses in graduate projects, of which one is the thesis (Drama 240)
- Three courses in acting (Drama 210, 130A-B, or 135 as qualified)
- One seminar in dramatic literature, performance theory, criticism, or history of the theatre (Drama 220-223)
- Nine courses in graduate voice tutorial (Music 218)
- Two courses in history of music theatre and opera (Drama 148A-B)
- Nine courses in dance

Lower-Division Courses in Drama

10 Introduction to Production Theory (4) F, S. An introduction to modern production techniques as practiced in realizing scenic designs. Equipment, theories, techniques, and history of production practices in the technical theatre; class instruction integrated with practical applications.

20 The Nature of Drama: Structure and Style (4). A general introduction to the dramatic literature of several periods, with an emphasis on dramatic form and meaning.

25 Shakespeare (4) F, W, S. A reading of selected plays by Shakespeare, with a focus on thematic and theatrical aspects of Shakespeare's art.

30A-B-C Acting (4-4-4), (30A) F, W, S, Summer, (30B) F, W, S, (30C) F, W, S. A one-year course in basic acting technique and discipline. (Note: All acting classes require strict adherence to stage discipline; unexcused class absences, for example, are not permitted.)

30A: Stage technique and stage discipline. Freeing vocal and physical movement and liberating emotional power. Elementary stage movement and voice. Elimination of regionalisms in speech. Overcoming stage fright. Readings in acting theory. **30B:** Improvisations and scenes. Rehearsal and presentation of at least two scenes with different partners. Developing stage contact with tactics in a "play" situation. **30C:** Characterization, scenes, and auditioning. Development of character in at least three rehearsed scenes from different plays. Script analysis and performance technique. Preparation of audition pieces. The profession of acting.

32 Beginning Playwriting (4). Writing of assigned exercises and the completion of the equivalent of a one-act play. Analysis of alternative forms: Absurdist, Brechtian, Naturalistic, and Symbolic, as well as the more traditional forms of comedy, tragedy, and melodrama. Same as English and Comparative Literature WR32.

35 Speech for the Theatre (4) F, W, S. A course aimed at (1) improving natural, clear, unaffected speech and (2) eliminating negative habits and regional accents: exercises for physical tension, vocal support, tone production, vocal quality, and articulation. Open only to Fine Arts majors. May be repeated for credit.

40A-B-C Development of Drama (4-4-4) F, W, S. A one-year lecture-discussion course (each quarter may be taken independently) in the development of Western Drama, concentrating on the

drama's intellectual, social, and artistic foundations. About 15 plays and supplementary critical material are read each quarter. **40A:** Greek Drama through Shakespeare. Readings from Aeschylus, Sophocles, Euripides, Aristophanes, Marlowe, Shakespeare, and the anonymous playwrights of the medieval theatre. **40B:** Restoration Drama through Ibsen. Readings from Neoclassic, Romantic, and Naturalistic European playwrights in the eighteenth and nineteenth centuries. Molière, Racine, Congreve, Goethe, Ibsen, and Chekhov are included. **40C:** Contemporary Drama. This quarter concentrates on the Post Naturalistic theatre: Expressionism, Epic Theatre, Theatre of the Absurd, and Contemporary American Theatre. Among the playwrights studied are Shaw, Pirandello, Giraudoux, Ionesco, Beckett, Williams, Brecht, Weiss, and Albee. Same as English and Comparative Literature CL 40A-B-C. (IV)

50A Introduction to Costume Design (4) F, W, S. An introduction to the process and procedures employed by the costume designer for the theatre. The elements of design are discussed in the context of character development, historical period, and style. Exercises extend to drawing, rendering, and investigation of human proportions.

50B Introduction to Scenic Design (4) F, W, S. Introduction to the principles and practice of scenic design. Weekly problems include research into various periods and styles of production with an emphasis on the conceptual idea. Perspective drawing, rendering, and model building are covered in studio exercises and assignments. Prerequisite: Drama 10.

50C Introduction to Lighting Design (4) F, W, S. Introduction to the principles, theories, and equipment employed by the lighting designer for the stage. Areas of investigation include history, technology, and script analysis. Detailed studio attention is given to the theory and practice of design.

Upper-Division Courses in Drama

100 University Theatre (4). Rehearsal and performance in a faculty-directed production. By audition only. May be repeated for credit.

101 Theatre Production. The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the construction of designed work as well as its applied execution during performance. Prerequisite: consent of instructor.

101A Theatre Production: Costume (2-4) F, W, S

101B Theatre Production: Scenic (2-4) F, W, S

101C Theatre Production: Lighting (2-4) F, W, S

101D Theatre Production: Stage Management (2-4) F, W, S

101E Theatre Production: Audio (2-4) F, W, S

103 Lectures in Dramatic Literature (4). Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth-Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy. May be repeated, provided topic changes.

104 Greek Drama (4). A concentrated examination of the major works of Aeschylus, Sophocles, Euripides, and Aristophanes, with additional readings in Greek dramatic theory and theatre history.

105A-B History of Theatre (4-4) F, W. The history of the stage, including the development of acting, directing, design, dramatic literature, and dramatic criticism. **105A:** to 1642. **105B:** after 1642.

117 Russian Stage and Film Drama (4). Development of the Russian theatre through the Symbolist drama to Futurism and the post-Revolutionary era. The innovation of twentieth-century stage directors, and masterpieces of the Soviet. Open to freshmen. Lectures, readings, and discussions in English.

120A-B History of Design and Production (4-4). The history of theatrical design and production. Scenery, costuming, stage lighting and machinery, and theatre architecture receive special attention, as do production methods and techniques. Prerequisites: Drama 105A-B.

130A-B Advanced Acting (130) Summer.

130A Basic Scenes (4) F, W, S. Rehearsal and presentation of at least five scenes from contemporary material. Exercises in developing relationship communication and character-to-character contact. May be repeated for credit.

130B Characterization and Style (4) W, S. Rehearsal and performance of four scenes developing characters in depth; examination of the credibility and theatricality of characterization and style. Prerequisite: Drama 130A. May be repeated for credit.

132 Advanced Playwriting (4). Completion of a full-length play or its equivalent; discussion of student writing and of relevant literary texts. Same as English and Comparative Literature 112. Prerequisites: Drama 32 and consent of instructor. May be repeated for credit.

133A-B Stage Combat (2-2) F, W. 133A: Stage combat including unarmed combat, knife-fighting, and sword-fighting. **133B:** Rapier and dagger. Basic techniques, attacks, parries, footwork, cloakwork; staff fighting Eastern and Western. Prerequisites: Drama 130A-B. May be repeated for credit.

135 Master Classes in Acting (1-4). Acting in specialized areas including television acting, improvisation, movement for the actor, body language, Shakespeare, Molière, restoration, theories, Kubuki, and modern Japanese theatre. Prerequisites: Drama 130A-B. May be repeated for credit.

140 Contemporary American Theatre (4). A close examination of works and trends in the American theatre since World War II, including current playwriting as represented by new plays produced in Los Angeles, New York, Chicago, and other major repertory theatre centers.

141 Contemporary British Theatre (4). A close examination of British theatre in the post-Suez (1956-on) period, with special attention to political trends in current British playwriting.

142 Contemporary Continental Drama (4). A close examination of continental European dramatic literature and theory. Readings from Camus, Sartre, Beckett, Ionesco, Genet, Mrozek, Handke, Brecht, and others.

148A-B History of Music Theatre and Opera (4-4) F, W. A general survey of the principal forces and styles at work in the musical theatre from 1600 to the present. Close study of the best examples of these styles.

150 Costume Production Techniques (4). Studio instruction in pattern making, draping, millinery, and construction techniques. Prerequisite: Drama 50A. May be repeated for credit.

151 Scenery Production Techniques (4). Theatre architecture, the physical stage and its equipment, the principles of scenery construction, and the nature and sources of scenic materials are among the lecture topics. Theatre engineering is studied as a drawing subject. Particular emphasis is given to the maintenance of design integrity in scenic execution. Prerequisite: Drama 50B.

152 Lighting Production Techniques (4). An exploration of the methods and resources used by the lighting designer in the theatre. Class tours are conducted to leading theatres and commercial suppliers to examine equipment and procedures first hand. Detailed studio attention is given to the development of stage lighting graphics and problems related to road troupings. Prerequisite: Drama 50C.

153 Makeup Production Techniques (4). A studio laboratory course in the techniques of stage makeup including projects in prosthetics and ventilation of hair. Prerequisite: consent of instructor.

154 Audio Production Techniques (4). A studio-lecture course in the basic theories and techniques of using audio reproduction and reinforcement as an integral part of a theatrical production.

155 Lighting Systems (4). A study of basic electrical practice used in theatrical lighting. Areas of investigation include control system design, system wiring, maintenance of equipment, and new developments in the field of lighting and illumination. Prerequisite: Drama 50C.

156 Scene Painting (4). A studio course in scenery painting. Full-scale projects in the techniques of the scenic artist will be practiced in the scenery studio. Prerequisite: Drama 50B or consent of instructor.

157 Lighting Composition (4). Provides an opportunity for students to pursue stage lighting composition in a studio atmosphere. Laboratory practice includes weekly exercises in style and genre. Emphasis is placed on the realization of conceptual ideas. Prerequisite: Drama 50C. May be repeated for credit.

158 Studio in Theatre Design (4). Examines the various functions of scenery and costume: locale, historical period, mood, and atmosphere, with special assignments in each area. Discussion of problems in scenic metaphors and visualization, with emphasis on techniques of planning and presentation (e.g., floor plans, models, and rendering). Prerequisite: Drama 50A or 50B, or consent of instructor. May be repeated for credit.

159 Proseminar in Theatre Design (4). Content varies. Prerequisite: consent of instructor. May be repeated for credit.

165 Music Theatre Workshop (4). A workshop in movement, vocal performance, and acting in the musical theatre. Exercises, preparation for auditions, scenes, and projects. Prerequisites: Drama 30A-B-C. May be repeated for credit.

170 Directing (4) F. The principles of stage directing, covering the director's functions in the areas of interpretation, composition, coaching, and styling a theatrical production. Directing exercises and projects; the final project is the preparation of a hypothetical proposal for a play production. May be repeated for credit.

171 Production Management (4) F. An examination of stage and production management. Areas of study include production organization, management practices, production scheduling, rehearsal and performance duties, union regulations, and production touring.

172 Contemporary Theories on Play Directing (4).

173A Theatre Orchestra (2).

175 Staging Shakespeare (4) W. A seminar in Shakespearean staging practice, both Elizabethan and contemporary. Students prepare a hypothetical production book for an assigned play as it could have been produced at the Globe Theatre in 1610, and a proposal to produce the same play in a contemporary manner today. Prerequisites: Drama 170 and consent of instructor. May be repeated for credit.

180 Contemporary Dramatic Criticism and Theory (4). Reading and analysis of theories and critical approaches to contemporary theatre: Stanislavski, Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism. May be repeated for credit.

182 History of Dramatic Criticism (4). Reading and analysis of the principal theorists and critics of dramatic art, including Aristotle, Corneille, Diderot, Dryden, Lessing, Coleridge, Zola, and Nietzsche, among others.

185 Advanced Directing (4). A seminar in directorial organization and research. Student prepares a textual and dramaturgical analysis, a production timetable, and a hypothetical production book of an assigned play. Prerequisites: Drama 170 and consent of instructor. May be repeated for credit.

189 Objective Drama (1-8) F, W, S. A practical study of ancient aspects of performance from various cultures. May be repeated for credit.

190 Studio in Acting (4). May be repeated for credit.

191 Studio in Directing (4). May be repeated for credit.

194 Criticism (4). May be repeated for credit.

197 Dramatic Literature (4). May be repeated for credit.

198 Drama Workshop (4) F, W, S. By audition or accepted proposal only. Consists of directing or acting in a regularly scheduled Drama Workshop production and submitting a final evaluation of all work performed. Workshop productions must be proposed by directors on departmental forms, and each project must be approved by the Workshop Committee. Pass/Not Pass only. May be repeated for credit.

199 Project in Theatre (1-4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

Graduate Courses in Drama

NOTE: All graduate courses in Drama may be repeated for credit.

200 Graduate Studio: Acting (2) F, W, S. Work in graduate studio taken in tandem with graduate studios in stage voice (Drama 201), stage speech (Drama 202), and stage movement (Drama 203).

201 Graduate Studio: Voice (1) F, W, S. Graduate studio in vocal production for actors.

202 Graduate Studio: Speech (1). Work in graduate studio: speech taken for one unit in tandem with nine graduate studios in stage voice (Drama 201), stage movement (Drama 203), and acting (Drama 210).

203 Graduate Studio: Movement (2). Training the body for acting; coordination, flexibility, pacing, and physical dynamics.

204A-B Graduate Studio: Combat (2) W, S. 204A: Stage combat including unarmed combat, knife-fighting, and sword-fighting. **204B:** Rapier and dagger. Basic techniques, attacks, parries, footwork, cloakwork; staff fighting—Eastern and Western.

211 Graduate Studio: Directing (4) F, W, S

212 Graduate Studio: Playwriting (4)

216 Graduate Music Theatre (4) F, W, S. A workshop in movement, vocal performance, audition technique, and acting for the musical theatre. Exercises, scenes, and projects.

217 Opera Workshop (4) F. Participation in staged performances of scenes from complete operas. The aim is to broaden the repertoire of singers by offering them opportunities to become acquainted with a wide variety of operatic roles.

218 Graduate Drama: Objective Drama (1-8). A practical study of the prehistory of performance, including traditional rituals from various world cultures.

219 Graduate Master Class (1-4) F, W, S. Various topics such as Shakespeare, comedy, Molière, improvisation, Kabuki, television acting.

220 Seminar in Dramatic Literature (4) F, W, S

221 Seminar in Criticism (4)

222 Seminar in Theatre History (4)

223 Seminar in Performance Theory (4). A study of major performance theories since Diderot's *Paradox of Acting*.

225 Seminar on Theatre Pedagogy (4) F, W, S. A seminar on the major teaching systems in the dramatic arts with particular attention to professional arts training. Graduate students in Drama only; required prior to applying for Teaching Assistantships in studio areas.

230 Seminar in Contemporary Theatre (4)

235 Script Analysis and Research (4) F. Analysis of dramatic scripts. Examination of dramaturgic structure, character intentions and interactions, historical and literary milieu, and potentials for theatrical realization.

240 Graduate Projects (1-4) F, W, S, Summer. Various projects depending on student's concentration (acting, design, musical theatre, directing).

245 Conceptualization and Collaboration (4) S. A study of the potential for directorial conceptualization and collaboration with designers in the areas of scenery, costume, lighting, and sound.

250 Directed Reading (4)

255 Graduate Design and Production (4) F, W, S. Studio exercises and projects in costume, scenery, lighting design, and stage management. Open only to Drama graduate students pursuing the Design and Production emphasis.

256 Designers' Presentational Techniques (4) F. A studio course in rendering techniques employed by costume and scenic designers for the stage. Projects will include graphic development for costume plates, atmospheric rendering, painters' elevations, and model building.

289 Objective Drama (1-8) F, W, S. A practical study of ancient aspects of performance from various cultures. Satisfactory/Unsatisfactory only.

295 Professional Internship (1-8) F, W, S, (1-12) Summer. An arranged internship at the South Coast Repertory Theatre, or other

equity theatre company, for qualifying M.F.A. students in acting and directing. A stipend and equity points are provided by the theatre company.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants.

Department of Music

Faculty

Joseph B. Huszti, M.Mus. Northwestern University, *Chair of the Department, Professor of Music, and Director, Voice and Choral Music* (conducting, choral ensembles, voice)

Bruce Bales, M.F.A. University of California, Irvine *Lecturer in Music* (choral ensembles, voice)

Haroutune Bedelian, Associate of the Royal Academy of Music, London, *Lecturer in Music* (violin, chamber ensembles)

Zelman Bokser, D.M.A. Eastman School of Music, *Assistant Professor of Music, Director of Instrumental Music, and Conductor of the UCI Symphony* (conducting, theory, composition)

Gary Bovyer, M.Mus. The Juilliard School, *Lecturer in Music* (clarinet)

Rae Linda Brown, Ph.D. Yale University, *Assistant Professor of Music* (history, American musics)

Rose Corrigan, B.A. University of Southern California, *Lecturer in Music* (bassoon)

Lucerne DeSa, M.M. University of Southern California, *Lecturer in Music* (piano)

Theresa Dimond, M.M. University of Southern California, *Lecturer in Music* (percussion)

Carol Drake, B.Mus. The Oberlin Conservatory; B.Mus. Northwestern University, *Lecturer in Music* (French horn)

Stephen Erdody, M.Mus. The Juilliard School, *Lecturer in Music* (violin/cello)

Kathleen Robinson Fraider, B.Mus. University of Southern California, *Lecturer in Music* (oboe)

Bernard Gilmore, D.M.A. Stanford University, *Associate Professor of Music* (composition, conducting, theory)

Patrick Goesser, M.A. University of Iowa, *Lecturer in Music* (vocal performance, voice, opera)

Kathleen Grant, M.F.A. University of California, Irvine, *Lecturer in Music* (choral ensembles)

Marvin Hayes, M.F.A. California Institute of the Arts, *Lecturer in Music* (voice)

Robert Hickok, B.Mus. Yale University, *Dean of the School of Fine Arts and Professor of Music* (conducting)

Nina Hinson, M.M. University of Southern California, *Lecturer in Music* (voice, opera)

William C. Holmes, Ph.D. Columbia University, *Professor of Music* (history, opera)

Rosemary Hyler, B.Mus. Catholic University of America, *Lecturer in Music* (accompanying, piano, vocal coaching)

Arnold Juda, Music Lyceum Amsterdam, *Lecturer Emeritus in Music* Alfred Lang, M.F.A. University of California, Irvine, *Lecturer in Music* (trumpet, jazz ensemble, wind ensemble)

Claudia Barritt Levine, B.Mus. The Juilliard School, *Lecturer in Music* (string bass)

Margaret Murata, Ph.D. University of Chicago, *Professor of Music* (history, theory)

Barbara Northcutt, B.Mus. University of Southern California, *Lecturer in Music* (oboe)

Peter S. Odegard, Ph.D. University of California, Berkeley, *Professor of Music* (theory, composition)

Ronald W. Sainio, M.Mus. University of Wisconsin, *Lecturer in Music* (basic voice, choral ensembles)

Robert Sanders, *Lecturer in Music* (tuba, trombone)

Mahlon Schanzenbach, M.A. California State University, Long Beach, *Lecturer in Music* (voice)

John Schneiderman, B.Mus. University of California, Irvine, *Lecturer in Music* (lute, guitar)

Nina Scolnik, Performance Diploma, The Juilliard School, *Lecturer in Music* (piano)

H. Colin Slim, Ph.D. Harvard University, *Professor of Music* (history)

Howard Swan, M.A. Claremont Colleges, *Lecturer in Music* (choral music, conducting)
 Mark Trawka, M.M. University of Southern California, *Lecturer in Music* (vocal accompanying, diction)
 Joanne Turovsky, M.M. University of Southern California, *Lecturer in Music* (harp)
 Michael Vaccaro, *Lecturer in Music* (saxophone)
 Willem F. Van Overeem, M.A. University of California, Berkeley, *Lecturer in Music* (piano)
 Mary Ella Van Voorhis, M.M. University of Idaho, Moscow, *Lecturer in Music* (voice)
 Marianne Whitmyer, B.A. University of California, Irvine, *Lecturer in Music* (flute)

Additional professional staff in instrumental music supplement the faculty in accordance with the needs of the program.

The Department of Music offers two undergraduate degrees (the Bachelor of Arts in Music and the Bachelor of Music), an undergraduate minor in Music, and the Master of Fine Arts degree in Fine Arts.

The Bachelor of Music (B.Mus.) degree program is performance-oriented. It offers students the opportunity to specialize in one of the following: bassoon, clarinet, contrabass, flute, French horn, harp, lute and guitar, oboe, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, voice. (The specialization appears on the student's UCI transcript.) In addition, B.Mus. students may qualify for the Special String Performance option, an intensified curriculum for professional-level students. All B.Mus. students receive continuous private instruction and present a solo recital during their senior year. B.Mus. students participate in performance classes each quarter. Vocal performance students focus on diction, movement, stage presentation, repertory, criticism, and style. Guitar and lute students focus on ensemble work, repertory with other instruments and voice, criticism, and pedagogy. Piano students give weekly solo performances before other students, and also focus on criticism, style, and interpretation. String, wind, brass, percussion, and also piano students focus on quartet work, small ensembles, and solo sonatas privately coached and presented in afternoon recitals.

The Bachelor of Arts (B.A.) degree program enables students to pursue elective subjects in music (such as composition or conducting), in the fine arts, or in other academic disciplines.

Several music scholarships are offered to promising undergraduate performers. Applications for a scholarship audition (usually held in March and May) should be made at the departmental office as soon as possible after the student has applied to the University; telephone (714) 856-6615.

The University's Education Abroad Program offers students the opportunity to study abroad in their junior year (see pp. 61-62). Music majors may enroll in conservatories and universities in several countries; highly qualified performers may be eligible to attend the Conservatorio G.B. Martini in Bologna, Italy.

In each baccalaureate degree program, students receive private lessons on their instruments, or in voice, and perform in orchestral or choral concerts, in chamber ensembles, and in solo recitals; however, such participation varies according to which degree the student elects to pursue.

A five-year program coordinated with the UCI Office of Teacher Education is available for students interested in obtaining a California Teaching Credential.

The Master of Fine Arts (M.F.A.) degree program in Fine Arts emphasizes composition, choral conducting, voice, piano performance, and instrumental performance.

Performance Opportunities

The Department offers a variety of choral ensembles that give every student, regardless of major, the opportunity to sing. Some groups participate in international concert tours. The California Chamber Singers, Concert Choir, Madrigal Singers, Women's Chorus, Men's Chorus, University Singers, and Jazz Singers make up the permanent ensembles. Additional performances are presented in conjunction with professional orchestras, invitational festivals, and Southern California concert venues. In December, the Department also produces the annual series of Madrigal Dinners that celebrate the Christmas season at the court of Henry VIII.

The UCI Symphony Orchestra offers participants an opportunity to explore the great masterworks of the standard orchestral repertory. The orchestra performs a number of programs each year and each performance features a guest artist. Artists during the 1988-89 season included Nina Hinson, soprano; Isabella Lippi, violin; David Shostac, flute; and Ronald Leonard, violoncello. In addition, a number of guest artists come to campus to give master classes.

Careers in Music

A degree in Music offers many career opportunities. Music is a highly competitive profession and a degree may or may not lead to professional employment with an orchestra or as a concert artist. Many graduates do, however, become successful freelance members of symphony orchestras, composers, and performers. Many others go on to pursue graduate degrees in performance, music history, conducting, arts management, music librarianship, composition, or secondary or postsecondary education. Some graduates have made careers in music publishing and in the recording industry.

Recommended Proficiency Levels for Entering Undergraduates

All entering majors are expected to have competence in reading and performing music and must audition for placement in the program.

Freshmen students wishing to enter either of the baccalaureate degree programs in Music should have had a minimum of two years of instrumental or vocal instruction and should know scales, fundamental notation, and triads. In addition, they should have the ability to read music in both treble and bass clefs. Basic keyboard skill is highly desirable, as is experience as a solo performer. Choral, orchestral, band, or stage experience is desirable.

Freshmen students who wish to pursue the B.Mus. degree should have, in addition to the above, at least three years (instead of two years) of private instruction; knowledge of scales, chords, and arpeggios; sight-reading ability; and a solo repertory from the sonata or chamber literature or the art song and oratorio literature.

Transfer students pursuing either undergraduate degree should have had college-level private instrumental or vocal instruction; two years of music theory; the history of western music; ear-training; sight-singing; sight-reading; and piano. All transfer students must pass a performance audition in order to enter either baccalaureate degree program.

For students pursuing the B.Mus. degree, results of the audition will determine the minimum number of quarters necessary to complete degree requirements. All transfer students also must take placement tests in musicianship, theory, and history in order to transfer these courses in fulfillment of the UCI Music degree requirements. These placement exams are given just before the beginning of the student's first quarter of study at UCI.

It is strongly recommended that all entering B.Mus. students have at least the following experience and/or abilities in music:

Voice students—at least two years of private study and/or participation in choral or instrumental ensemble; some facility

at the keyboard; a background in Italian, French, and German art songs.

Piano students—ability to perform a Haydn or Mozart sonata, a two-part invention of Bach, and all the major and minor scales and arpeggios.

Woodwind and brass students—ability to sustain tone production; accurate intonation over a dynamic range (from *pianissimo* to *fortissimo*); control of breath and articulation; all major and minor scales and arpeggios (*legato* and *staccato*) commensurate with the range and technique of the particular instrument; ability to play and read repertory of a difficulty comparable to the symphonies of Haydn, Mozart, Beethoven, and Schubert; and demonstrable knowledge of the sonata literature for the particular instrument.

Sample Program — B.A.

	Freshman	Sophomore	Junior	Senior
Fall	Music 5A Music 30A Elective (Music 10) Elective (Ensemble) English and Comparative Literature WR39A	Music 15A Music 35A Breadth II Elective	Music 40A Instrument Ensemble Breadth III	Music 155A (Ensemble) Breadth V Elective
Winter	Music 5B Music 30B Elective (Music 10) Elective (Ensemble) English and Comparative Literature WR39B	Music 15B Music 35B Breadth II Instrument Ensemble	Music 40B Breadth III Instrument Ensemble Elective	Music 155B Breadth V (Ensemble) Elective
Spring	Music 5C Music 30C Elective (Music 10) Instrument or Voice Ensemble English and Comparative Literature WR39C	Music 15C Music 43 Instrument Ensemble Breadth II	Music 40C Instrument Ensemble Elective Breadth III	Music 145 Ensemble Breadth V Elective

Sample Program — B.Mus.

	Freshman	Sophomore	Junior	Senior
Fall	Music 5A Music 30A Elective (Music 10) Major group ¹ English and Comparative Literature WR39A	Music 15A Music 35A Music 40A Major group ¹	Breadth II Breadth III Major group ¹	Music 155A Breadth V Major group ¹
Winter	Music 5B Music 30B Elective (Music 10) Major group ¹ English and Comparative Literature WR39B	Music 15B Music 35B Music 40B Major group ¹	Music 192J Breadth II Breadth III Elective Major group ¹	Music 155B Breadth V Major group ¹
Spring	Music 5C Music 30C Elective (Music 10) Major group ¹ English and Comparative Literature WR39C	Music 15C Music 40C Music 43 Major group ¹	Music 145 Breadth II Breadth III Major group ¹	Music 192S Breadth V Elective Major group ¹

¹Three courses taken concurrently that are determined by the student's major. See *Course Groups by Major* chart below.

Course Groups by Major

	Piano major	Voice major	Guitar/Lute major
Private Lesson	Music 165	Music 168	Music 190
Solo Performance Class	Music 175	Music 63, 163	Music 174
Ensemble	Music 176	Music 162, 171	Music 176
	String major	Woodwind/Brass major	Percussion major
Private Lesson	Music 166	Music 167	Music 190
Solo Performance Class	Music 176, 194	Music 176	Music 176
Ensemble	Music 160	Music 160, 161	Music 160, 161

Percussion students—mastery of rudimentary drum techniques; some knowledge of piano.

String students—ability to produce a clear tone and precise intonation with and without vibrato; controlled vibrato; slurred, *detaché*, *louré*, *staccato*, and simple *spiccato* bow strokes; knowledge of all major and minor scales and arpeggios; ability to play and read repertory of a difficulty comparable to the symphonies of Haydn, Mozart, Beethoven, and Schubert as well as demonstrable knowledge of the sonata literature for the particular instrument.

Special String Performance students—**Violin**: major and minor scales and arpeggios through three octaves, one movement from a Bach unaccompanied sonata or partita, one movement from a Classical or Romantic sonata, and two contrasting movements of a Classical or Romantic concerto from the standard repertory; **Viola**: major and minor scales and arpeggios through three octaves, one movement from a Bach suite, one movement of a sonata or concerto from the standard repertory (e.g., Brahms sonata, or concertos by Handel, Hoffmeister, Bartók, or Telemann); **Violoncello**: major and minor scales and arpeggios through three octaves, one movement from a Classical sonata (e.g., Sammartini G major sonata, Beethoven sonata) or two contrasting movements from a Bach suite, one movement from a Romantic sonata (e.g., Brahms, Strauss) or one movement of a concerto from the standard repertory (e.g., Lalo, Saint-Saëns, Dvořák, Haydn); **Double Bass**: major and minor scales and arpeggios, a solo from Saint-Saëns' *Carnival of the Animals* or comparable work, two contra string movements from any concerto of the standard repertory.

Guitar and lute students—ability to perform a Renaissance fantasy and dance (e.g., Dowland, Holbourne), a baroque prelude and dance (e.g., Bach, Weiss), a classical etude, sonata, or theme and variations (e.g., Sor, Giuliani), and a twentieth-century etude (e.g., Villa-Lobos, Brouwer). Ability to sight-read single lines on all parts of the fingerboard and multi-voice pieces up to the fifth position. Prior knowledge of the lute is desirable but not required. Guitarists with a nonclassical background (fingerstyle, jazz, rock) will be considered if they have adequate facility on the instrument and the desire to explore the classical guitar and lute repertory.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None.

Departmental Requirements—Core

Five quarters of theory (Music 30A-B-C and 35A-B); two years of musicianship (Music 5A-B-C and 15A-B-C); one year of music history (Music 40A-B-C); one quarter of tonal counterpoint (Music 43); attainment of a passing score on the Basic (sight-reading) Piano Examination, to be taken no later than the first quarter of the junior year.

Bachelor of Arts Degree: Satisfactory completion of the Core requirements; two quarters of analysis (Music 155A-B); one quarter of twentieth-century music (Music 145); two years of instrumental or vocal instruction (12 units maximum, selected from Music 65-68, 165-168, or 190); two years of ensemble or repertory classes as assigned by the Department (12 units selected from Music 63, 160-164, 169, 171-176, 178, 194). Transfer students must complete at least six units of instrumental or vocal instruction in residence and six units in ensemble or repertory courses in residence.

Bachelor of Music Degree: Satisfactory completion of the Core requirements; two quarters of analysis (Music 155A-B); one quarter of twentieth-century music (Music 145); instrumental or vocal instruction each quarter of residence (Music 165-168 or 190); senior recital (Music 192S); completion of the following courses each quarter of residence and according to the specialization selected: *orchestral or band instruments*—orchestra or wind ensemble, as assigned by the Department (Music 160 or 161) and chamber ensembles (Music 176); *guitar and lute*—guitar and lute workshop (Music 174) and chamber ensembles (Music 176); *piano*—piano repertory (Music 175) and chamber ensembles (Music 176); *voice*—chorus or chamber singers (Music 162 or 171) and vocal performance (Music 63 or 163). With permission of the director of the program in voice, a student when in residence may substitute two quarters of acting (Drama 30A-B) and two quarters of music theatre workshop (Drama 165) for a maximum of four quarters of vocal performance (Music 63 or 163). During the quarter of their senior recital students, by permission of the Music faculty, may be exempted from their ensemble requirement.

Sample Programs — Special String Performance B.Mus.

	Freshman	Sophomore	Junior	Senior
Fall	Music 5A	Music 15A	Music 40A	Music 194
	Music 30A	Music 35A	Music 194	Music 177
	Elective (Music 10)	Music 77	Music 177	Music 160
	Music 77	Music 160	Music 160	Breadth V
	Music 160	Fine Arts course	Breadth III	Music Elective
	English and Comparative Literature WR39A	Breadth II		
Winter	Music 5B	Music 15B	Music 40B	Music 194
	Music 30B	Music 35B	Music 194	Music 177
	Elective (Music 10)	Music 77	Music 177	Music 160
	Music 77	Music 160	Music 160	English and Comparative Literature WR139
	Music 160	Fine Arts course	Music 192J	
	English and Comparative Literature WR39B	Breadth II	Breadth III	Breadth V
Spring	Music 5C	Music 15C	Music 40C	Music 194
	Music 30C	Music 43	Music 194	Music 177
	Elective (Music 10)	Music 77	Music 177	Music 160
	Music 77	Music 160	Music 160	Music 196
	Music 160	Fine Arts course	Music Elective	Breadth V
	English and Comparative Literature WR39C	Breadth II	Breadth III	

Bachelor of Music Degree (Special String Performance):

Satisfactory completion of the Core requirements; four years of instruction in the major instrument (Music 77 and 177); four years of orchestra (Music 160); two years of chamber music (Music 194); any three courses in history or criticism of art, dance history, development of drama, dramatic literature, or film criticism; four to eight units of a music elective selected from Music 145, 135A, 135B, 140-144, 155A-B); senior recital (Music 196).

Program Requirements for the Minor

One year of history of music (Music 4A-B-C or 40A-B-C); one year of theory (Music 30A-B-C); eight units of studio tutorials (private lessons) selected from Music 65-68, 165-168 or 190; 10 units in performance ensembles selected from Music 160-162 or 178.

Residence Requirement for the Minor: A minimum of four upper-division courses for the minor must be taken at UCI.

Master of Fine Arts Program**Degree Offered**

M.F.A. in Fine Arts, with emphasis in composition, choral conducting, voice, piano performance, and instrumental performance.

Admission

Applications for admission to the degree program are normally submitted by March 1 for the following fall quarter. Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A. in Music, or B.Mus., or the equivalent. Applicants should have completed at least two years of college study, or the equivalent, of one of the following languages: French, German, Italian, or Latin.

Applicants must also submit an 8 to 10 page paper on a musical subject (analytical, theoretical, historical); this requirement may be fulfilled by the submission of an undergraduate term paper.

All applicants for programs in performance must audition for members of the music faculty. In special cases, a recently recorded demonstration of performance may be accepted. Applicants for the program in composition must submit scores and tapes of their works.

All students accepted for admission must demonstrate competence in basic musical skills: sight-singing, written and keyboard harmony dictation, and minimal facility at the keyboard (including sight-reading). Normally these skills are tested the week before fall quarter begins. Students who do not pass the tests upon matriculation must do so before enrolling for any second-year courses.

General Degree Requirements

Normally, two years of residence are required. Each candidate must enroll for three courses each quarter for six quarters, exclusive of summer sessions. Reading knowledge of one language other than English (French, German, Italian, Latin) must be demonstrated by written examination administered through the Department of Music. This examination must be scheduled no later than the third quarter of residency and must be passed before the candidate may schedule the comprehensive examination.

Comprehensive examinations are normally taken after three to four quarters in residence as a prerequisite to candidacy for the M.F.A. degree. A student failing these examinations may reschedule them once in the following quarter. Participation in performance at UCI throughout residence is required.

Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. Not more than 20 units in upper-division courses may count toward the degree. Specific course requirements must be completed in one of the following areas:

Composition: two courses in bibliography (Music 200); two courses in directed reading (Music 250); six courses in graduate studio composition (Music 212); three courses in graduate projects (Music 240); two quarters of tutorials (Music 190); one quarter of tutorials (Music 191); three electives; preparation of a project in composition, supported by a written essay of about 20 pages.

Choral Conducting or Voice: two courses in bibliography (Music 200); two quarters of tutorials (Music 190); five courses in graduate studio vocal literature (Music 210); one quarter of tutorials (Music 191); two courses in directed reading (Music 250); three quarters of graduate projects (Music 240); four electives; preparations of a project in performance, supported by a written essay of about 20 pages.

Piano Performance: two courses in bibliography (Music 200); one course in directed reading (Music 250); six courses in graduate studio instrumental literature (Music 211); three quarters of graduate projects (Music 240); six quarters of chamber ensembles and performance, of which at least two will be devoted to contemporary music (Music 176); three electives. There will be a solo recital at the end of each of the two years of residence.

Instrumental Performance: two courses in bibliography (Music 200); one course in directed reading (Music 250); six courses in graduate studio instrumental literature (Music 211); six quarters of chamber ensembles and performance, of which at least two will be devoted to contemporary music (Music 176); three quarters of graduate projects (Music 240); three electives. There will be a solo recital at the end of the second year of residence. Performance in a large ensemble each quarter of residence, as assigned by the music faculty.

Lower-Division Courses in Music

4A-B-C History of Western Music (4-4-4) F, W, S. A survey of styles in Western music from ancient times to the present. Emphasis on acquiring a thorough knowledge of specific examples of music representing the principal styles of Western art music. For non-majors and minors in Music. (IV)

5A-B-C Musicianship I (2-2-2) F, W, S. Sight-singing, harmonic, rhythmic, and melodic dictation; exercises in rhythm. Corequisites: enrollment in freshmen theory (Music 30A-B-C) and piano (Music 10), or demonstrated proficiency. Prerequisite: Music major or consent of instructor.

10 Basic Piano (2) F, W, S. For music majors with little or no piano experience, this course provides the necessary background for realizing keyboard exercises required in the theory and harmony courses, and develops skills to play and sight-read simple music from different periods.

15A-B-C Musicianship II (2-2-2) F, W, S. Two- to four-part dictation, sight-singing including simple atonal melodies, keyboard harmony, C clefs. Corequisite for 15A: Music 35A. Corequisite for 15B: Music 35B. Prerequisites: Music 5A-B-C or equivalent.

18 Basic Voice (2) F, W, S, Summer. Class instruction for nonmusic majors. Students must be enrolled in Music 162 or Drama 165 in the current year. Prerequisite: Music 25 or consent of instructor.

20 The Nature of Music (4) F. A nonhistorical introduction designed to teach students how to listen to music by immediate response to its basic elements. Neither an ability to read music, nor any extensive familiarity with it, is required.

25 Fundamentals of Music (2) F, S, Summer. Scales, key signatures, notation, basic progressions, intervals, reading, intonation, transposition, basic rhythms.

30A-B-C Theory I (4-4-4) F, W, S. The study of traditional common-practice diatonic harmony, through written and keyboard drill. Basic harmonic theory, triads, seventh chords, sequences, modulation, elementary figured bases. Prerequisite: Music 25 or equivalent.

35A-B-C Theory II: Chromatic Harmony (4-4-4) F, W, S. Two-, three-, and four-part writing; altered and chromatic chords; extended modulations and large-scale harmonic structure. Corequisite for 35A: Music 15A. Corequisite for 35B: Music 15B. Prerequisites: Music 30A-B-C or equivalent.

40A-B-C History of European Music to Wagner (4-4-4) F, W, S. A survey of Western music. An introduction to the analysis of musical styles and forms and to the sources for constructing music history and reconstructing historical music. **40A:** to Josquin; **40B:** to J.S. Bach; **40C:** to Richard Wagner. Prerequisites: Music 5C and 30C or equivalent; Music 35B recommended for 40C. Open to Music majors and qualified Music minors only. (IV)

43 Tonal Counterpoint (4) S. Exercises and composition in two- and three-part writing, canon, and fugue. Prerequisite: Music 35B or equivalent. Open only to music majors.

63A-B-C Vocal Performance: Diction and Movement (2-2-2) F, W, S. Diction and movement techniques; the International Phonetic Alphabet and fundamentals of song interpretation for the stage. Music majors and Music minors concentrating in voice only. **63A:** English and Italian; **63B:** French and German; **63C:** topic varies. May be repeated for credit.

65 Intermediate Piano (1-2) F, W, S. Private weekly lessons for piano students in the B.A. program and Music minors. By audition only. May be repeated for a maximum of 12 units of credit.

68 Intermediate Voice (1-2) F, W, S. Private weekly lessons and coaching for lower-division students in voice, upper-division voice students in the B.A. program, and Music minors. Corequisite: Music 162 or 171. May be repeated for a maximum of 12 units of credit.

77 Private Lesson (Special String Performance majors) (4) F, W, S. A one-hour weekly private lesson. Instruction in technique and literature. For lower-division Special String Performance students only. May be repeated for credit.

92 Sophomore Recital (0) F, W, S. Solo or joint public recital by audition only and with departmental approval. Prerequisites: Music 5A-B-C; 30A-B-C. Corequisite: Music 174, 175, or 176. Open to music majors and minors, except students concentrating in voice. Pass/Not Pass only.

Upper-Division Courses in Music

135A Modal Counterpoint (4) F. Exercises and composition in two-, three-, and four-part writing in the sixteenth-century style. Prerequisite: Music 5C, Music 30C, or equivalent. Not offered 1989-90.

135B Advanced Counterpoint (4) W. Advanced exercises and composition in two- and three-part tonal writing, canon, and fugue, as well as some contemporary forms. Prerequisite: Music 43. Not offered 1989-90.

NOTE: Courses in the 140-145 sequence are for Music majors and include such topics as: The Motet in the Thirteenth and Fourteenth Centuries (140), Renaissance Keyboard Music (141), The Cantatas of Bach (142), Mozart's Operas (143), Early Nineteenth-Century Opera (144), Schoenberg, Bartók, and Stravinsky (145). Topics vary from quarter to quarter; each course may be repeated for credit. In addition, special courses in the 140-145 series numbered N are also offered for nonmajors.

140 Studies in Medieval Music (4)

141 Studies in Renaissance Music (4)

142 Studies in Baroque Music (4)

143 Studies in Classical Music (4)

144 Studies in Romantic Music (4)

145 Studies in Twentieth-Century Music (4) S

150A-B-C Composition (4-4-4) F, W, S. Exercises and projects for diverse instrumental-vocal combinations; contemporary techniques and problems. Participation in the improvisation ensemble and working with electronic media. Prerequisite: Music 15C, 30C or equivalent, or consent of instructor. May be repeated for credit.

155A-B Analysis (4-4) F, W. Methods of formal analysis applicable to all Western musical styles: additive, continuous, transformational, and hierarchic forms; rhythm, texture, and sonority as form and process. Prerequisite: Music 15C, 35B, and 40B-C, or equivalent.

160 University Orchestra (1-2) F, W, S. Study and performance of standard orchestral repertory and works by contemporary composers. Emphasis on ensemble techniques including articulation, balance, phrasing, expression, accompanying. Two concerts per quarter; musicians required to attend all rehearsals. One unit of credit for Music majors; two units of credit for Music minors and nonmajors. May be repeated for credit.

160L Orchestral Tutorial (1-2) F, W, S. Tutorial instruction for individual players in the University Orchestra, combining private instruction with independent practice. Corequisite: Music 160. Open to Music minors and Music majors in the B.A. program who have completed 12 units of tutorial credit; and only upon consent of the Director of the Orchestra.

161 University Wind Ensemble (2). An ensemble devoted to the study and performance of music written for varying combinations of wind and percussion instruments. Concerts typically include works for small groups (e.g., octets), as well as those for full symphonic wind ensemble. Membership open to both Music majors and nonmajors by audition only. May be repeated for credit.

162 University Chorus (2) F, W, S. Included in the University Chorus are Concert Choir, Freshman Chorus, Men's Chorus, Women's Chorus, Jazz Choir, Collegium Musicum. Each quarter a major concert is prepared, often with orchestral accompaniment. Membership is open by audition. May be repeated for credit.

162L Basic Voice Laboratory (2) F, W, S. Vocal technique and musicianship for selected singers in UCI's choral organizations. Not open to Music majors. Corequisite: Music 162. Prerequisite: consent of Director of the choral group. May be repeated for credit.

162P University Chorus: Accompanying (2) F, W, S. Keyboard accompanying for one of the UCI choral organizations, with individual coaching in sight reading, score reading, and other accompanying skills. Intended for, but not restricted to, Music majors and minors concentrating in piano performance. By audition only. Prerequisite: Music 30C or equivalent. May be repeated for credit.

163A Vocal Performance: Repertory I (2) F. Technique, diction, and interpretation through the preparation in repertory of English and Italian (in alternate years), mastering the International Phonetic Alphabet, developing a critical ear for intelligibility. Students prepare songs from the standard repertoire to be presented in public recitals. Limited to Music majors and minors concentrating in voice and to University Extension students by audition. May be repeated for credit.

163B Vocal Performance: Repertory II (2) W. Technique, diction, and interpretation through preparation of repertory in French and German (in alternate years), mastering the International Phonetic Alphabet, and developing stage presentation and style. Limited to Music majors and minors concentrating in voice and to University Extension students by audition. May be repeated for credit.

163C Vocal Performance: Special Topics (2) S. A workshop on changing topics such as operatic scenes, modern music, extended vocal techniques, single composers (e.g., Mozart). Gesture, stance, stage presence, and acting are stressed. Only for Music majors concentrating in voice. May be repeated for credit.

164 Opera Workshop (2). Students participate in staged performances of scenes from complete operas. The aim is to broaden the repertoire of singers by offering them opportunities to become acquainted with a wide variety of operatic roles.

165 Advanced Study in Piano (1-2) F, W, S. Designed to give students the technique, musical insight, and performance experience for interpreting works of the piano literature in concert performances. Private weekly lessons. Open to Music majors and minors only. May be repeated for credit.

166 Advanced Study for String Instruments (2) F, W, S. Private weekly lessons. Open to Music majors and minors only. Corequisite: Music 160, 161, 162, or 178. May be repeated for credit.

167 Advanced Study for Wind Instruments (2) F, W, S. Private weekly lessons. Open to Music majors and minors only. Corequisite: Music 160, 161, 162, or 178. May be repeated for credit.

168 Advanced Study in Voice (2) F, W, S. Designed for voice majors; students are selected by audition. Private weekly lessons. Corequisite: concurrent enrollment in Music 162 or 171. May be repeated for credit.

169 Conducting (4). Fundamentals of baton technique, score study, transposition, and orchestration. Prerequisites: Music 15C and Music 40A-B-C or equivalents.

170 Orchestration (4). Ranges and capabilities of modern orchestral instruments. Exercises in writing for various combinations of wind, string, and percussion instruments and for full orchestra. Although designed for music majors, the course is open to anyone possessing the requisite theoretical background. Prerequisites: Music 30C or equivalent; Music 5C.

171 Chamber Singers (2). A select ensemble specializing in vocal chamber music from all periods. Frequent performances on and off campus. Membership is open to all UCI members by audition.

172 Chamber Orchestra (2). An ensemble of 12-20 members. Open to all UCI students by audition. May be repeated for credit.

173 Band (2). A 40- to 50-member ensemble which plays classical, jazz, and pop arrangements for athletic events and social and charity functions both on and off campus.

174 Guitar and Lute Workshop (2) F, W, S. A practical class for the improvement of sight-reading skills by ensemble playing. The workshop also covers specialized forms of notation employed for the guitar and lute, and the history and literature of these instruments. May be repeated for credit.

175 Piano Repertory (2) F, W, S. Weekly two-hour meetings for students to perform before each other, followed by open discussion. The aim is to develop a sense of self-criticism and the ability to listen intelligently. Normally each student also participates quarterly in piano recitals. May be repeated for credit.

176 Chamber Ensembles and Performance (2) F, W, S. A class for instrumental majors (woodwind, brass, strings, percussion, guitar, lute, piano) wherein members perform solo and chamber music at each meeting before their fellow students. Critical listening and constructive criticism are encouraged. May be repeated for credit.

177 Private Lesson (Special String Performance majors) (4) F, W, S. A one-hour weekly private lesson. Instruction in technique and literature for Special String Performance option at junior and senior levels. Corequisite: Music 196. May be repeated for credit.

178 Jazz Band (2) F, W, S. Rehearsal and performance of literature written for large jazz ensemble with emphasis on methods and materials. Laboratory setting for new arrangers and/or composers of modern jazz pieces. Prerequisite: consent of instructor. May be repeated for credit.

179 Percussion Ensemble (2) F, W, S. Instrumental performance experience in percussion. Principles of percussion performance practices including individual styles. Prerequisite: ability to read music and/or understanding of common musical usages and notations. May be repeated for credit.

180 Music Criticism (4). Topics vary.

190 Studio Tutorials in Music (2) F, W, S. Private lessons for Music majors and minors in guitar/lute and percussion, as well as for graduate composition students in piano, strings, winds, voice, guitar/lute, and percussion. May be repeated for credit.

191 Tutorial in Music (4) F, W, S. May be repeated for credit.

192J Junior Recital (0) F, W, S. Solo or joint public recital by audition only and with departmental approval. Prerequisites: Music 15A-B-C; 35A-B. Corequisite: Music 163, 174, 175, or 176. Open to music majors only. Pass/Not Pass only.

192S Senior Recital (0) F, W, S. Solo public recital by audition only. Prerequisites: Music 15C; 35B; 40A-B-C or equivalent; 155A. Corequisite: Music 163, 174, 175, or 176. Pass/Not Pass only.

194 Chamber Music (2) F, W, S. Performance of classical, romantic, and contemporary chamber music works. Includes private coaching (every other week) and an open forum for constructive criticism by class members. Open to string players and a limited number of woodwind players and pianists by audition. May be repeated for credit.

195 String Quartet Proseminar (2) F, W, S. Designed to acquaint string players with the repertoire of the string quartet through open rehearsals and seminars. May be repeated for credit.

196 Special String Senior Recital (4) F, W, S. A full, public recital to be given in the senior year. The program must include works from the major periods of music (e.g., Baroque, classical, romantic, modern). For Special String Performance students only. Corequisite: Music 177. May be repeated for credit.

197 Vocal Accompanying (2) F, W, S. Designed for advanced singers and pianists. Performance practice, styles of vocal literature: German *Lieder*, French *mélodies*, twentieth-century art song.

198 Music Workshop (4) F, W, S. May be repeated for credit.

Graduate Courses in Music

All graduate courses may be repeated for credit.

200 Bibliography and Research (4-4) F, W. Required of all entering students. A systematic introduction to the bibliographical tools both in the general field of music and in the students' areas of specialization.

210 Graduate Studio: Vocal Literature (4-4-4) F, W, S. Includes studies in vocal literature, vocal pedagogy, and diction and performance.

211 Graduate Studio: Instrumental Literature (4-4-4) F, W, S. Contents will vary according to the student's major instrument. The core of this course is intensive private instruction and study of the various instrumental literatures.

212 Graduate Studio: Composition (4-4-4) F, W, S. Intensive work in composition geared to each student's level of competence.

218 Graduate Voice Tutorial (2-2-2) F, W, S. Advanced studies in vocal technique. Private weekly lessons. May be repeated for credit. Prerequisite: acceptance into graduate program in Drama with an emphasis on music theatre.

220 Seminar in Music History (4)

230 Seminar in Contemporary Music (4) F, W, S. Special seminar projects dealing with music of the twentieth century with emphasis on analytical techniques and style criticism. May be repeated for credit.

240 Graduate Projects (4-4-4) F, W, S. Contents vary according to the student's area of concentration. For composers contents include preparation of works for performance; for singers and choral conductors contents include study of conducting and the preparation of solo and choral works for performance; for pianists contents include master classes in performance; and for other instrumentalists contents include participation in the University Orchestra.

250 Directed Reading (4)

260 Thesis (4). By consent.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

Department of Studio Art

Faculty

- Jerry Anderson, M.F.A. University of Arizona, *Chair of the Department and Lecturer in Studio Art* (new directions in art forms)
- Judy Baca, M.A. California State University, Northridge, *Assistant Professor of Studio Art* (drawing with an emphasis on murals and mural technique)
- Ed Bereal, Chouinard Art Institute, *Lecturer in Studio Art* (live art performance using social/political themes, video documentation and presentation)
- Tony DeLap, Claremont Graduate School, *Professor of Studio Art* (painting and design, architecture)
- Thomas W. Jenkins, M.F.A. University of Colorado, *Lecturer in Studio Art* (sculpture, painting)
- John Paul Jones, M.F.A. University of Iowa, *Professor of Studio Art* (printmaking, intaglio techniques)
- Craig Kauffman, M.F.A. University of California, Los Angeles, *Professor of Studio Art* (drawing and painting)
- Robin Mitchell, M.F.A. California Institute of the Arts, *Lecturer in Studio Art* (drawing and painting)
- Gifford C. Myers, M.F.A. University of California, Irvine, *Assistant Professor of Studio Art* (ceramics)
- Art Nomura, M.F.A. University of California, Los Angeles, *Lecturer in Studio Art* (video production)
- Melinda Wortz, M.A. University of California, Los Angeles, *Lecturer in Studio Art, Director of the University Fine Arts Gallery* (art history, museum problems with emphasis on contemporary artists and exhibitions)

The Studio Art curriculum provides basic studio experiences in the fundamental concepts and techniques of drawing, painting, sculpture, ceramics, graphics (printmaking), video and art photography, and a study of the history and criticism of art. The curriculum constantly relates studio practice to the development of the visual arts and current critical theory. It aims to develop a sense of visual awareness through as wide a range of the study of arts as possible. The student majoring in Studio Art develops creativity by learning to think with the materials and techniques of various media.

Departmental faculty expect students at both the undergraduate and graduate levels to be willing to experiment and change rather than to conform with the kind of work they were doing when they were admitted into the program. The faculty supports work in process as well as finished projects, so long as the student is practicing sustained and disciplined work habits.

The University's Education Abroad Program offers students the opportunity to study abroad. Special programs for Studio Art majors are offered in Venice (for graduate-level study also) and in Florence; the latter program, at Il Bisonte, focuses on lithography and intaglio printmaking.

Careers for the Studio Art Major

Department faculty and gallery exhibitions have provided career examples and inspiration for prospective professional artists. An unusually high percentage of alumni have gone on to successful exhibitions and arts management careers. Many graduates teach at all levels and work in museums as curators or preparators (those who prepare the gallery for an exhibit and hang or install the works). A Studio Art major is also good preparation for graduate-level study.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: None.

Departmental Requirements for the Major

Studio Art 30A-B-C; Art History 40A-B-C or any three courses from Art History 20A, B, C, D, E, F; three quarters

in lower-division studio courses; three quarters in history of modern art; 12 upper-division studio courses (Studio Art 145 through 199).

Sample Program for Freshmen

Fall	Winter	Spring
Studio Art 30A	Studio Art 30B	Studio Art 30C
Art History 40A	Art History 40B	Art History 40C
Elective	Elective	Elective
English and Comparative Literature WR39A	English and Comparative Literature WR39B	English and Comparative Literature WR39C

Master of Fine Arts Program

Degree Offered

M.F.A. in Fine Arts, with emphasis in Studio Art.

General Information

The M.F.A. program focuses on development of experimental concepts and approaches relevant to contemporary issues as they affect visual arts, rather than on traditional techniques and ideas. A small, personal environment supports the individual's efforts in research, development, and exhibition of ideas by providing as much latitude for special needs as possible. Faculty meeting with students on a one-to-one basis or in small groups provides a variety of art experiences. Internships, selected field trips, contemporary exhibitions in the University Art Gallery, contact with visiting professional artists, and seminars provide the framework for the program.

Off-campus graduate student studio space is available on a limited basis by application to the appropriate program chair or to the graduate advisor.

Admission

Applicants for admission to the degree program must meet the general requirements for admission to graduate study, hold a B.A. or B.F.A. in Art, and submit by March 1 a portfolio of their creative work or 12 or more slides, on a #80 Kodak Carousel tray, of their most recent work. Normally, anyone who has earned an M.F.A. degree in Studio Art will not be considered for admission into the program.

General Degree Requirements

Normally two years of residence are required. Each candidate must enroll for three courses each quarter for six quarters, exclusive of summer sessions.

The student's progress and body of work will be reviewed by a faculty committee yearly. A satisfactory opinion by this committee will allow the student to progress to candidacy for the degree.

Satisfactory attainment must be demonstrated by a specific creative project, which usually takes the form of a graduate exhibition in the University Art Gallery. This project is to be supported by a thesis incorporating visual and written material relevant to the project and the candidate's creative research while at UCI. Oral defense of the project and essay may be required to test the candidate's general knowledge in the area in which the project falls.

Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B or a Satisfactory in each course. Not more than 20 units in upper-division courses may count toward the degree. Electives may be taken in any discipline. The 72 units will normally be made up in the following manner:

First Year: three courses in graduate problems (Studio Art 215A-B); three seminars in problems of contemporary art (Studio Art 230); three courses in graduate projects (Studio Art 240).

Second Year: two courses in graduate problems (Studio Art 215A-B); three seminars in problems of contemporary art (Studio Art 230); three courses in graduate projects (Studio Art 240); one course in thesis (Studio Art 260).

Lower-Division Courses in Studio Art

30A-B-C Visual Arts Fundamentals (4-4-4) F, W, S. Addresses the individual's relationship with art through a series of experiences and exercises which include reading materials, studio art projects using specifically designated materials, slides, and discussion. The art projects deal with environment, space, time, form, and personal content. Must be taken sequentially. Basic foundation for studio art majors. (IV)

35A-B-C Contemporary Artists (4-4-4) F, W, S. Concepts and processes of contemporary artists. An exploration of the issues and artists of contemporary times, with special emphasis on art of the last 40 years. Slide lectures are supplemented with field trips to museum exhibitions, private collections, and artists' studios, and with films. Reading consists of artists' writings and those of contemporary critics. Same as History of Art 35A-B-C. (IV)

50A Basic Drawing (4) F, W, S. Basic techniques and introduction to drawing materials and surfaces. Life drawing and still-life drawing focusing on skill development and "learning to see." May be repeated for credit three times with the consent of the instructor.

60 Basic Painting (4-4) F, W, S, Summer. A five-hour course taught weekly by regular faculty members or visiting artists. Encourages experimental use of painting techniques dealing with a variety of problems in basic structure, elements of space, and surface quality. Classes often move into experimental fields with discussions on historical development of painting and formal approaches to this medium. Slides and discussion/critiques; occasional field trips.

70 Basic Sculpture (4-4-4) F, W, S. An introduction to a variety of techniques used to fabricate three-dimensional objects. Cutting, joining, and assembly of wood, metal, and plastic; casting, modeling, and carving.

80 Basic Printmaking (4-4-4) F, W, S. Basic techniques, materials, and methods including relief and intaglio. Emphasizes techniques and development of aesthetic expression.

86 Basic Ceramic Sculpture (4-4-4) F, W, S. Exploration of the use of clay on a sculptural basis with an emphasis on development of an idea. Hand-building, glazing, finishing processes, and use of other structural materials. Experimentation encouraged. Laboratory fee.

90 Basic Video (4-4-4) F, W, S. Introduction to the tools of video and television production: cameras, lighting, microphones, video recording and editing machines. Use and application of video in studio and electronic news-gathering.

91 New Concepts/Performance Art I (4-4-4) F, W, S. Introduction to the concepts and history of performance art. Exploration of basic elements of audience- and non-audience-oriented performance and the relationship of performance art to other arts.

96 Basic Photography and Art (4-4-4) F, W, S. A workshop covering camera function, equipment, and use; processes such as spotting, bleaching, hand-coloring, development, enlargement and presentation, and papers. Emphasis on self-expression through assignments, and critiques. Students must have 35 mm manual camera. Fee for materials.

Upper-Division Courses in Studio Art

With the exception of Studio Art 197A, 197B, 197C, and 198, all advanced problems, special studies, and tutorial courses may be repeated for credit.

145 The Art of Architecture (4) F, W, S. Early Modernism, the influence of Cubism on architecture, and philosophy of Early Modernism (The International School). Late and Post-Modernism and what is happening today between artists and architects. Students construct models, present drawings, and paintings related to topics. Prerequisites: Studio Art 30A-B-C, Studio Art 35A-B-C, and one studio course.

150A-B Intermediate Drawing (4-4) F, W, S, Summer. Continuation of basic drawing exercises with emphasis on composition and experimentation with media. Conceptual foundation for an individual art-making process, explored with an emphasis on self as subject matter. Prerequisites: Studio Art 50A and 35A-B-C.

150C Advanced Drawing (4) F, W, S. Advanced studio problems for visual exploration. Students pursue individual solutions to self-defined and presubscribed projects. Techniques/materials are individual choice. Continual analysis of the personal process. Prerequisites: Studio Art 50A, 150A-B. May be repeated with consent of instructor.

160A-B Intermediate Painting (4-4) F, W, S. An introduction to twentieth-century art history. Experience in the use of paint and other related materials typical to this era. Slides, film, video, field trips. Prerequisite: Studio Art 60.

160C Advanced Painting (4) F, W, S. Students deal with and present ideas which relate to contemporary painting. Slides, field trips, and discussions with the artist/instructor. Prerequisites: Studio Art 30A-B-C and 160A-B.

170A-B Intermediate Sculpture (4-4) F, W, S. Prerequisites: Studio Art 35A-B-C and Studio Art 70.

170C Advanced Sculpture (4) F, W, S. Development of a personal direction in and in-depth exploration of contemporary sculpture art. Prerequisite: Studio Art 170A-B.

180A-B Intermediate Printmaking II (4-4) F, W, S. Addresses techniques and processes of intaglio printing, dry point, grounds, photo-etching, and a variety of experimentation on the etching plate. Prerequisites: Studio Art 35A-B-C and 80. May be repeated with consent of instructor.

180C Advanced Printmaking (4) F, W, S. Concentration on personal development through intensive focus on conceptual and experimental use of a chosen print medium, and the development of technical skills. Prerequisites: Studio Art 180A-B.

186A-B Intermediate Ceramic Sculpture (4-4) F, W, S. Development of technical and conceptual skills related to ceramic sculpture. Hand-building, casting, glaze formulation, kiln building, and firing. Prerequisites: Studio Art 35A-B-C and Studio Art 86.

186C Advanced Problems in Ceramic Sculpture (4) F, W, S. Discussion of ideas, techniques, and personal control of form. Clay body, fabrication, glazing, and firing. Emphasis on development of personal direction. Prerequisites: Studio Art 186A-B. May be repeated with consent of instructor.

188 History of Intermedia (4) F, W, S. The history of intermedia in the twentieth century—the entire realm of artwork that melds otherwise discrete artistic disciplines into a seamless unity which includes visual poetry, conceptual art, performance art, and music-theatre.

190 Studio Problems: Methods/Materials (4) F, W, S. Presentation of projects which cannot be dealt with in other more specifically defined studio courses. Emphasis on manifestation of ideas through conversation and presentation of work. May be repeated for credit.

191A-B Intermediate Performance Art I, II (4-4) F, W, S. Further exploration of the elements of performance. Emphasis on individual work. Examination of methods of creating performance pieces and technical aspects of presentation. Prerequisites: Studio Art 35A-B-C and Studio Art 91.

191C Advanced Performance Art III (4) F, W, S. Advanced study in performance art. Critical analysis of individual performance work and how it applies to the field and society at large. Prerequisites: Studio Art 191A-B. May be repeated with consent of instructor.

192 Studio in Painting (4)

193 Studio in Sculpture (4)

194 Studio in Graphic Art (4)

195 Art Museum Problems (4). Lectures and practical experience in staffing the UCI Fine Arts Gallery, preparing for exhibitions, receptions, and learning the basic technical and operational needs of a gallery. Students interact directly with professional artists. Field trips, critiques, and internship programs with other museums and galleries are available.

196A Intermediate Photography and Art (4) F, W, S, Summer. Refined skills in developing, printing, enlarging. Expanded use of darkroom, solution of technical problems, development of personal style and concepts through assignments. Must have 35 mm. camera. Prerequisites: Studio Art 96 or portfolio review; consent of instructor. Laboratory materials fee. May be repeated with consent of instructor.

196B Advanced Photography and Art (4) F, W, S. Intermediate to advanced lecture and critique on photography and its relationship to producing art. Emphasis on techniques such as black and white printing. Introduction to small cameras. Possibilities of color and conceptual art are explored through assignments. Prerequisites: Studio Art 196A or portfolio review; consent of instructor. Laboratory materials fee. May be repeated with consent of instructor.

197A Narrative Video Production (4) F. Introduction to basic elements and styles of video and television. Hands-on use of studio and location video equipment. Participation in production exercises. Emphasis on preproduction, original script, and storyboard. Prerequisite: Studio Art 90 or consent of instructor.

197B Narrative Video Production (4) W. Further exploration of textual usage to create or reinforce dramatic significance of images. Production of script and storyboard produced in Studio Art 197A through use of television studio and/or location production equipment. Prerequisite: completion of Studio Art 197A with a grade of B or better.

197C Narrative Video Production (4) S. In-depth discussion, hands-on experience with aesthetics and techniques of video editing. Emphasis on postproduction process. Departmental screening of finished work. Prerequisites: Studio Art 197A and Studio Art 197B.

198A Intermediate Narrative Video Production (4-4-4) F, W, S. Preproduction, production, and/or editing of a video project. Credit contingent upon instructor's approval of proposed project. Prerequisites: Studio Art 190A or 190B, Studio Art 197C; consent of instructor.

199 Special Study (4) F, W, S. Individual study as arranged with faculty member. Used when special circumstances arise during normal progress of study. Prerequisite: consent of instructor. May be repeated for credit.

ensure that all students are exposed to faculty members on an individual basis. May be repeated for credit.

230 Seminar in Problems of Contemporary Art (4) F, W, S. May be repeated for credit.

240 Graduate Projects (4) F, W, S. May be repeated for credit.

250 Directed Reading (4). May be repeated for credit.

260 Thesis (4) S. Limited to second-year graduate students preparing for candidacy during their final quarter.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

Graduate Courses in Studio Art

210 Graduate Studio: Painting (4). May be repeated for credit.

211 Graduate Studio: Sculpture (4). May be repeated for credit.

212 Graduate Studio: Ceramics (4). May be repeated for credit.

214 Graduate Studio: Graphic Art (4). May be repeated for credit.

215A Graduate Problems (4) F, W, S. General seminar led by a visiting artist addressing contemporary, social, and art world issues; examines specific work of participants related to those issues. Explores a broad spectrum of disciplines including performance art, music, painting, sculpture, installations, and combinations thereof. May be repeated for credit.

215B Graduate Problems (4) F, W, S. Faculty members select an issue in contemporary art or their own work. Course is intended to

School of Humanities

Terence D. Parsons **Dean**

The School of Humanities sets for itself the goal of helping to develop both the analytical and creative powers of its students with particular respect not only to vocational goals, but also the larger questions of human conduct, the modes of human communication and symbolization, speculative thought, and the verbal arts. The School includes those basic disciplines of language, literature, history, and philosophy that deal fundamentally with the texture and dimensions of experience, both individual and social, past and present. The School takes as its concern a large portion of the liberal education not only of students who intend to major within its confines, but also of students who come to it from other parts of the campus. Because of the nature of the disciplines collected in the School, it is deeply concerned with language and its many facets. Further, though the School has established a number of specific major courses of study, it is intent on integrating the basic disciplines in a variety of ways at the undergraduate level and to some extent at the graduate level.

Degrees

Classical Civilization	B.A.
Classics	B.A., M.A., Ph.D.
Comparative Literature	B.A., M.A., Ph.D.
English	B.A., M.A., M.F.A., Ph.D.
Film Studies	B.A.
French	B.A., M.A., Ph.D.
German	B.A., M.A., Ph.D.
History	B.A., M.A., Ph.D.
Humanities	B.A.
Linguistics	B.A.
Philosophy	B.A., M.A., Ph.D.
Russian	B.A.
Spanish	B.A., M.A., M.A.T., Ph.D.

Honors at Graduation

Students are nominated for honors at graduation on the basis of scholarship and special achievements. To be eligible for nomination the student must file an Application for Graduation and meet the following criteria by the end of the winter quarter of the senior year: (1) achieve a UC grade point average of at least 3.40, (2) complete at least 18 courses (72 units) in residence at a UC campus, and (3) receive strong recommendation from the major department. Eligible students are automatically considered for Honors at Graduation.

Undergraduate Programs

The School offers undergraduate majors in Classical Civilization, Classics, Comparative Literature, English, Film Studies, French, German, History, Humanities (an interdisciplinary major which might include an Emphasis in Women's Studies, Concentration in Religious Studies, Minor in Global Peace and Conflict Studies, Minor in Latin American/Chicano Studies, or other area of interest) Linguistics, Philosophy, Russian, and Spanish. It offers courses in Chinese, Japanese, Italian, and Portuguese.

The Humanities Undergraduate Counseling Office, located in the Humanities Annex Building, is prepared to help all students in planning a program of study. Transfer students in particular will need to consult an academic counselor to determine major requirements. Students who expect to pursue graduate study also should consult with appropriate faculty members to ensure proper preparation.

A corps of lower-division advisors is designed to meet the special needs of freshmen and sophomores who are inter-

ested in the humanities but who have not chosen a major in the School. The advisors are particularly interested in undergraduate education and are especially knowledgeable about University regulations, requirements in and outside the School, course content, options to major, and other matters that may present difficulties. For the first two years, students in Humanities are encouraged to explore the various disciplines represented in the School. During that time the lower-division advisor is prepared to help the undeclared student keep options to a major open, plan a coherent program of humanistic study, and reach an eventual decision about the major.

Generally each major stipulates a one-year course that is both an introduction to the discipline and a prerequisite to the major itself. Students who plan wisely will construct programs that include a good number of such courses.

NOTE: In many undergraduate courses in the School of Humanities, additional meetings between individual students and the instructor may be required.

Undergraduate students in the School of Humanities participate in the affairs of the School in a number of ways: by serving on committees of various departments, by sitting with the faculty in its meetings, and by serving on the Humanities Council, which directly advises the Dean.

Graduates of the School of Humanities often go on to graduate and professional schools. An undergraduate major in the humanities is excellent preparation for future careers in law, teaching at all levels, business, journalism, administration, government service at all levels, and also medicine.

Humanities Honors Program

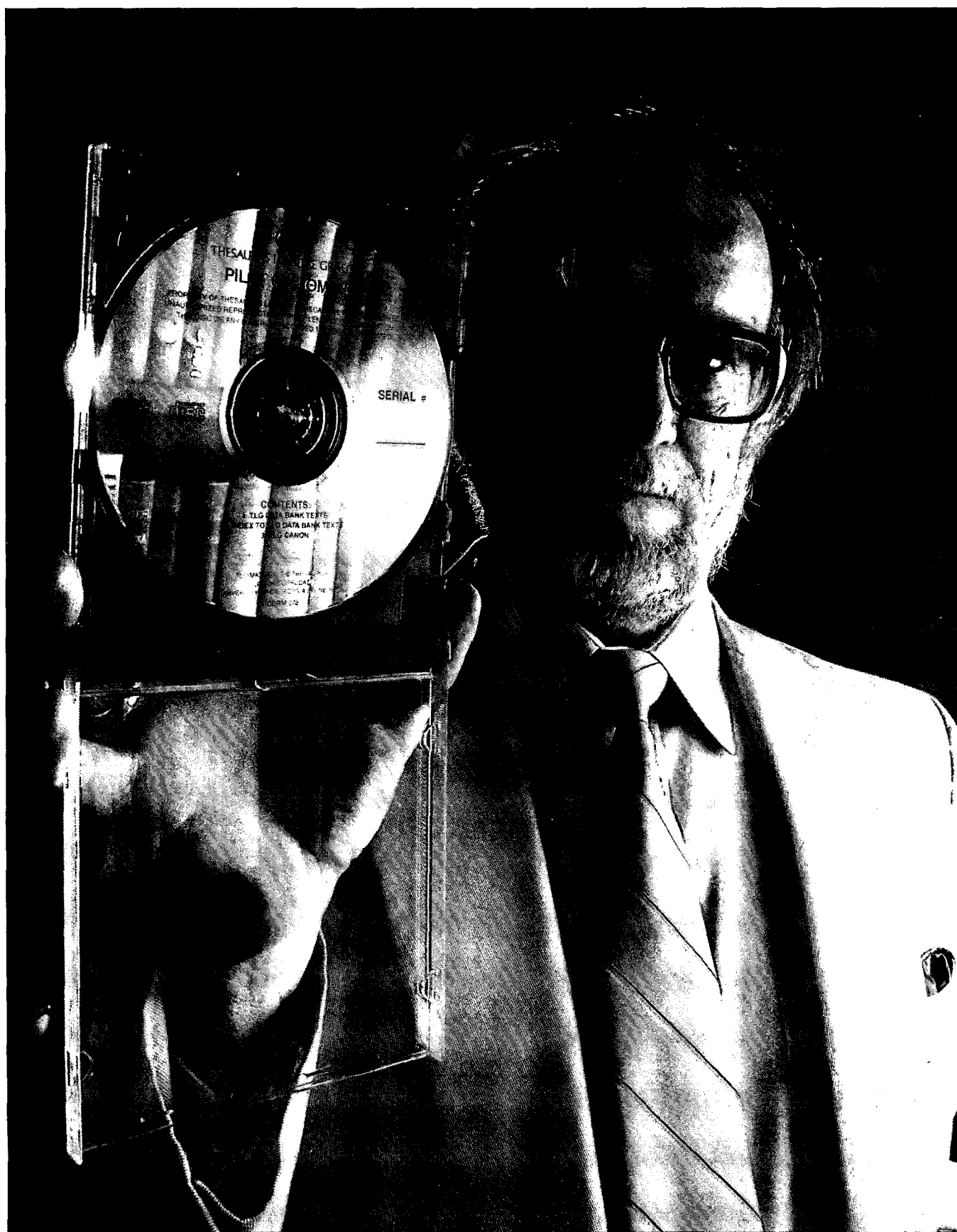
The Honors Program of the School of Humanities is designed to challenge superior students and provide them with unique opportunities for interdisciplinary work. Honors Program participants have the added advantage of being able to pursue independent research with a faculty member and to participate in advanced seminars in humanistic inquiry. The Program is open by invitation to students from programs and disciplines outside the School of Humanities. Additional information is available from the Humanities Undergraduate Counseling Office; telephone (714) 856-5132.

Language Learning Resource Center

The Language Learning Resource Center (LLRC) provides audio, video, computer, and reference materials in the nine languages offered by the School of Humanities, as well as equipment and facilities, for use by students, faculty, and staff. Audio and reference materials also are available in over 40 additional languages.

LLRC facilities include a language laboratory, a listening laboratory, a video laboratory/conference area, and a computer resources center.

The LLRC also administers a translation referral service which provides members of the community and local businesses with the names of qualified interpreters, translators, and tutors. Members of the community also are welcome to use LLRC materials and facilities.



Professor Theodore Brunner's Thesaurus Linguae Graecae Project is a data bank of Greek literature from its Homeric beginnings to the end of the Byzantine era (circa A.D. 600). Approximately 60 million words are now available to the global research community.

The Language Learning Resource Center is located in 207 and 213 Humanities Hall and is open from 8:00 a.m. until 4:00 p.m., Monday through Friday. The telephone number is (714) 856-6344.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61 and 62.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements

Humanities 1A-B-C, taken in the freshman year (transfer students may substitute appropriate course work in composition, literature, history, humanities, and philosophy for the Core Course by permission; apply in the Humanities Undergraduate Counseling Office); two years of work in a single acceptable foreign language, either modern or classical (through 2C), or equivalent competence; quarterly consultation with an assigned advisor and the advisor's written approval for the program of study decided upon. Consultation should be made by the second week of each quarter.

Foreign Language Placement. Students entering UCI with previous foreign language training are placed as follows: in general, one year of high school work is equated with one quarter of UCI work. Thus, students with one, two, three, or four years of high school foreign language will normally enroll in 1B-, 1C-, 2A-, or 2B-level language courses, respectively. Exceptions must have the approval of the appropriate course director. Transfer students may not repeat foreign language courses for which they received credit upon matriculation to UCI.

School Residence Requirement: At least five upper-division courses required for each major must be completed successfully at UCI. See individual major requirements for specific courses.

Graduate Programs

The School offers a wide program of graduate degrees. Although the Master's degree is offered in most departments, the programs emphasize the Ph.D. and give distinct preference in admission to those students who intend to take that degree. Exceptions are the two-year Master of Fine Arts in English (Creative Writing) and the two-year Master of Arts of Teaching in Spanish. In addition to the seminars offered by the various departments, the School sponsors a number of interdisciplinary seminars annually. These courses are taught jointly by faculty members from various departments. Further, several departments offer a few students the opportunity to do part of their work for the Ph.D. in a related discipline.

A limited number of students is accepted annually to study for teaching credentials. This program is a cooperative effort between the School and the Office of Teacher Education.

Graduate students in the School of Humanities participate in the affairs of the School in a number of ways: by serving on committees of the various departments, by sitting with the faculty in its meetings, and by serving on the student graduate advisory committee, which directly advises the Dean.

Department of Classics

Faculty

Dana F. Sutton, Ph.D. University of Wisconsin, *Chair of the Department and Professor of Classics* (Greek and Latin drama, Greek poetry)

Luci Berkowitz, Ph.D. The Ohio State University, *Professor of Classics* (pastoral poetry, literary criticism)

Theodore F. Brunner, Ph.D. Stanford University, *Professor of Classics and Director, Thesaurus Linguae Graecae Project* (computer application to classical literature, Augustan literature)

Walter Donlan, Ph.D. Northwestern University, *Professor of Classics* (early Greek literature and social history)

Richard I. Frank, Ph.D. University of California, Berkeley, *Associate Professor of Classics and History* (Roman history, Classical tradition)

Shelley P. Haley, Ph.D. University of Michigan, *Assistant Professor of Classics* (Latin historiography, women in antiquity)

B.P. Reardon, D.U. Université de Nantes, *Professor of Classics* (Late Greek literature, Greek novel)

Patrick Sinclair, Ph.D. Northwestern University, *Assistant Professor of Classics* (Latin prose, lexicography)

Undergraduate Program

The Department of Classics aims to provide the undergraduate student with a working knowledge of the origins and heritage of Western civilization. The Department is committed to a twofold purpose: (1) disseminating interest in and knowledge of Classical Civilization through the teaching of Greek and Latin language and literature; and (2), helping students, through courses in Classical literature, history, civilization, mythology, and religion taught through English translations, to appreciate the high achievements of Greek and Roman culture and their pervasive influence on our own civilization.

The Department offers both a major in Classics (with an emphasis on Greek, Latin, or Linguistics) and a major in Classical Civilization in which most of the required courses are in English translation. Students are encouraged to consult with the Classics faculty regarding the appropriate choice of major and design of program.

For the Classics major, study of the Classics must be based on competence in both Greek and Latin. The Classics program is designed to provide the student with this competence as rapidly as possible, so that by the end of first-year Greek or Latin the student has already been introduced to some of the major Classical authors in the original. From then on, courses are devoted to reading and interpreting the literature of ancient Greece and Rome. In addition to their training in the languages, students gain first-hand knowledge of the literature, history, and thought of the ancient world through the close study of some of its finest writers.

The major in Classical Civilization is designed for students who do not plan to concentrate on the Classical languages or pursue graduate study in the classics, yet wish to obtain an undergraduate degree based on a sound knowledge of the Classical world. This major requires one year of study (or its equivalent) in either Greek or Latin and a minimum of 10 courses taught in English translation concerning such topics as Classical literature, civilization, history, archaeology, art, drama, and philosophy.

The student planning to major in Classics or Classical Civilization should obtain a copy of the brochure, "Undergraduate Study in Classics," available in the departmental office.

Students entering UCI with previous Greek or Latin training can be given advanced standing. Usually, one year of high

school work is equated with one quarter of UCI work. Thus, students with one, two, three, or four years of high school Latin (or Greek) will enroll in Latin (or Greek) 1B, 1C, 25, and 101 respectively. Placement may vary, depending on the extent of the student's preparation. Students with transfer credit for Greek and/or Latin may *not* repeat those courses for credit. Students with high school training in the classical languages are encouraged to consult with the Classics staff before enrolling in Classics courses.

The Department adheres to the policy of giving its students an opportunity to participate in the departmental decision-making process. Student representatives, elected from and by the undergraduate majors, participate in all departmental meetings. They are responsible for maintaining close liaison with their constituency, for representing the students' interest in curriculum and personnel matters, and for the evaluation of both the academic program and the academic staff.

Inquiries regarding language placement, prerequisites, planning a program of study, or other matters related to the Department's offerings should be directed to the Office of the Chair, 142 Humanities Hall, telephone (714) 856-6735 or 856-5896.

Hebrew and Judaic Studies

Courses in Hebrew and Judaic Studies were initiated by the Department of Classics in September 1976, through a joint agreement between the School of Humanities and the University of Judaism in Los Angeles. Normally two years of Hebrew are offered, which meet the Humanities foreign language requirement. Emphasis is on modern Israeli-spoken Hebrew, with some instruction in Biblical Hebrew during the second year. Hebrew language courses will not be offered in 1989-90. Courses will continue to be offered in aspects of Jewish history, philosophy, and literature (Classics 180A-B-C, 181, and 182A-B-C). Through this program the Department of Classics is able to broaden its offerings to include both the Greek and Hebrew contributions to Western civilization.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for Majors

Two separate majors: Classics (with an emphasis in Greek, Latin, or Linguistics) and Classical Civilization.

Classics (Greek emphasis): Greek 1A-B-C; Greek 25; Greek 101-102; Greek 105A-B-C; Greek 110; Latin 1A-B-C; Latin 25; Latin 101-102.

Classics (Latin emphasis): Latin 1A-B-C; Latin 25; Latin 101-102; Latin 105A-B-C; Latin 110; Greek 1A-B-C; Greek 25; Greek 101-102.

Classics (Linguistics emphasis): two possible plans of study. *Greek concentration*—Greek 25, 101, 102, 105A-B-C; Latin 25, 101, 102; Linguistics 50, 110, 120, 130 (Greek 120 recommended) or *Latin concentration*—Latin 25, 101, 102, 105A-B-C; Greek 25, 101, 102; Linguistics 50, 110, 120, 130 (Latin 120 recommended).

NOTE: With the permission of the Department, an additional course at the 100 level in the same language may be substituted for Greek or Latin 25.

Classical Civilization: Latin (or Greek) 1A-B-C, or equivalent; Classics 35A-B-C or 50A-B-C; four upper-division Classics courses; three additional courses in classical history, classical philosophy, or classical art.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for Minors

The Department offers minors in Greek, Latin, and Classical Civilization.

Greek: Greek 1A-B-C, 25, 101, 102, 105A-B-C. Greek 120 may be substituted for one course at the 100 level.

Latin: Latin 1A-B-C, 25, 101, 102, 105A-B-C. Latin 120 may be substituted for one course at the 100 level.

Classical Civilization: Classics 35A-B-C or Classics 50A-B-C; five courses from Classics 140, 150, 151, 160, 165, 169, 170.

Residence Requirement for the Minor: Four upper-division courses must be successfully completed at UCI.

Planning a Program of Study

The Department believes in close consultation with students on academic advising and program planning. Students planning to major (or minor) in Classics or Classical Civilization are strongly urged to consult with the departmental faculty at the earliest possible moment to learn about the various programs.

Career Opportunities

The study of the ancient world is a valuable possession for modern life. The discipline of Classics is an important part of a liberal education. Greek and Latin language and literature, history and philosophy, mythology and religion make an excellent basis for exploring all periods of Western culture down to the present day. Classics is an interdisciplinary study, exploring human culture by a variety of methods from a variety of points of view. For this reason, the student who chooses to major in Classics or Classical Civilization may find many professional opportunities open.

Graduate and professional schools in medicine, law, management, and other fields welcome students with training in the Classics. So do many business corporations. Business, industry, and technology are well acquainted with the value of a Classical education. They are aware that students with a strong background in a respected and challenging major such as Classics are disciplined thinkers who can express themselves in clear, coherent, and cogent language, capabilities that are considered valuable in future physicians, lawyers, and managers.

There are also specific vocational opportunities open to the graduate in Classics or Classical Civilization. A major in this field may lead to a career in high school teaching, or (after appropriate further study) in college or university teaching. It is also an excellent preparation for advanced study in other academic disciplines such as archaeology, history, comparative literature, philosophy, and linguistics, as well as for theological studies and for work in a wide range of the humanities and social sciences.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Graduate Program

From the program's inception in 1970, emphasis has been on close attention to each student's progress, together with a relatively high reliance on independent work. Each graduate

student is assigned to a faculty preceptor, who monitors student progress in language skills, knowledge of the discipline, competence in research, and experience in teaching. The principal strength of the Department lies in the fields of language and literature. The graduate program is closely connected with the Thesaurus Linguae Graecae research project, (see page 12), and this especially recommends our program to prospective students interested in computer-assisted research in these areas.

The Department offers a Ph.D. program with specializations in Greek or Latin. The program is based on a three-year cycle of seminar and course work. Graduate students enroll in the following courses each quarter for three years: Classics 220 (seminars, devoted mainly but not exclusively to major literary topics); Classics 230 (directed reading courses, focusing on the graduate reading list); and Classics 240 (Greek and Latin language study, with regular exercises in prose composition and translation).

Diagnostic tests administered at the start of the graduate student's career are used in planning work, so that each student is encouraged to focus their energies and to progress in a steady, organized manner. Progress evaluation examinations are administered regularly in order to identify student strengths and weaknesses. Normally a total of three years of course work is required for the Ph.D. A comprehensive candidacy examination is required after the completion of course work, and a dissertation is required. Experience in supervised teaching and/or research activity normally is required.

Beginning in 1989-90 an M.A. degree in Classics with specializations in both Greek and Latin will be offered. All students entering the Ph.D. program, with the exception of those granted advanced standing because they hold the M.A. degree from another institution, will be concurrently enrolled in the M.A. program. The requirements for the M.A. degree will be six quarters of course work (i.e., 72 units), passage of a special set of examinations, and completion of a paper. The normative time for completion of the M.A. degree will be two years. Course work for the M.A. degree will normally consist of three quarters of Classics 210A-B-C, three quarters of Classics 220, six quarters of Classics 230, and six quarters of Classics 240. Completion of a minimum of three quarters of Classics 220 is required. Students will be required to pass a departmentally administered reading examination in German, or otherwise demonstrate proficiency in German in a manner acceptable to the Department, by the beginning of the second year of course work. Demonstration of reading proficiency in German will be a prerequisite to admission to Classics 220 seminars. Upon completion of the requirements for the M.A. degree, a student will be permitted to continue in the Ph.D. program only upon a positive vote of the majority of the Classics faculty.

In addition to the above, instruction is given regularly in the tradition, methods, and tools of classical scholarship, including computer application to literature.

In addition to course work, students are required to read extensively in the general field of Classics, under faculty guidance.

Students take written examinations, and their progress is assessed periodically. Students are required to pass a reading examination in a second modern language by the end of the third year. After course work is completed, each student must pass an individually designed qualifying examination, covering both the general field of Classics and the student's own interests, in order to become a candidate for the Ph.D. and enter the dissertation stage.

The resources of the program are appreciably enhanced by contributions from other sources. In particular, cooperative arrangements are in force among the Classics graduate programs of the UC campuses at Irvine, Los Angeles, Riverside, and Santa Barbara. Additionally, the program calls on visiting scholars, faculty from other UCI departments, and members of the Thesaurus Linguae Graecae Project (see below).

Thesaurus Linguae Graecae Project

The Thesaurus Linguae Graecae Project, a unique resource for research in Greek literary and linguistic studies, is closely affiliated with the Department of Classics although it is administratively separate. For further details, see page 12.

Undergraduate Courses

Greek

Greek 1A-B-C Fundamentals of Greek (5-5-5) F, W, S. 1A-B: Elements of classical Greek grammar, syntax, and vocabulary. **1C:** Introduction to reading texts.

Greek 20A-B-C Intensive Greek (5-5-5) Summer. Offered in summer session only. Covers, in eight weeks, the equivalent of Greek 1A-B-C. Will be offered if enrollment warrants; those interested should contact the Department.

Greek 25 Grammar Review and Survey of Greek Literature (5) F. Intensive review of grammar and survey of Greek literature with an introduction to selected authors for students who have passed 1C or its equivalent or have had two years or more of the language at the high school level. (V)

Greek 99 Special Studies in Greek (4-4-4) F, W, S. Consultation with instructor necessary prior to registration.

Greek 101 Greek Prose (4) W. Introduction to Greek prose with readings from the works of a major prose author such as Herodotus. Prerequisite: Greek 25, equivalent, or consent of the Department. (V)

Greek 102 Greek Poetry (4) S. Introduction to Greek poetry with readings from the works of a major poet such as Homer. Prerequisite: Greek 101, equivalent, or consent of the Department. (V)

Greek 105A-B-C Seminar in Greek Literature (4-4-4) F, W, S. Studies in specific Greek authors and topics arranged in a two-year sequence, i.e., prose, epic, philosophy; drama, history, lyric. May be repeated for credit provided topic varies. Prerequisite: Greek 102, equivalent, or consent of the Department.

Greek 110 Prose Composition (4). Studies in Greek grammar and syntax through composition of sentences and passages in Greek prose. Prerequisite: Greek 25, equivalent, or consent of the Department.

Greek 120 Reading of Selected Portions of the New Testament (4). Portions read may change each time course is offered. May be repeated for credit provided content varies. Prerequisite: Greek 1C or equivalent.

Greek 198 Directed Group Study (4-4-4) F, W, S. Special topics in Greek culture and civilization through directed reading and research. Consultation with instructor necessary prior to registration.

Greek 199 Independent Studies in Greek (4-4-4) F, W, S. Consultation with instructor necessary prior to registration.

Latin

Latin 1A-B-C Fundamentals of Latin (5-5-5) F, W, S. 1A-B: Elements of Latin grammar, syntax, and vocabulary. **1C:** Introduction to reading texts, including study of the poetry of Catullus and selected readings.

Latin 20A-B-C Intensive Latin (5-5-5) Summer. Offered in summer session only. Covers, in eight weeks, the equivalent of Latin 1A-B-C. Will be offered if enrollment warrants; those interested should contact the Department.

Latin 25 Grammar Review and Survey of Latin Literature (5) F. Intensive review of grammar and survey of Latin literature with an introduction to selected major authors for students who have passed 1C or its equivalent, or have had two years or more of the language at the high school level. (V)

Latin 99 Special Studies in Latin (4-4-4) F, W, S. Consultation with instructor necessary prior to enrollment.

Latin 101 Latin Prose (4) W. Introduction to Latin prose with readings from the works of a major prose author such as Cicero. Prerequisite: Latin 25, equivalent, or consent of the Department. (V)

Latin 102 Latin Poetry (4) S. Introduction to Latin poetry with readings from the works of a major poet such as Vergil. Prerequisite: Latin 101, equivalent, or consent of the Department. (V)

Latin 105A-B-C Seminar in Latin Literature (4-4-4) F, W, S. Studies in specific Latin authors and topics arranged in a two-year sequence, i.e., prose, epic, satire; drama, history, lyric. May be repeated for credit provided topic varies. Prerequisite: Latin 102, equivalent, or consent of the Department.

Latin 110 Latin Prose Composition (4). Studies in Latin grammar and syntax through composition of sentences and passages in Latin prose. Prerequisite: Latin 25, equivalent, or consent of the Department.

Latin 120 Introduction to Vulgar and Medieval Latin (4). Morphological, syntactical, and lexical developments in post-classical Latin illustrated by a variety of texts. Prerequisite: Latin 1C or consent of instructor.

Latin 198 Directed Group Study (4-4-4) F, W, S. Special topics in Roman culture and civilization through directed reading and research. Consultation with instructor necessary prior to enrollment.

Latin 199 Independent Studies in Latin (4-4-4) F, W, S. Consultation with instructor necessary prior to enrollment.

Classics

Classics 5 Building English Vocabulary through Greek and Latin Roots (4) F, W, S. Formation and use of English words from Greek and Latin derivatives. Particularly useful for first-year students who wish to augment their vocabulary systematically.

Classics 10 Scientific and Specialized Terminology (4) F, W, S. A study of English terms derived from Greek and Latin and important to contemporary medicine, science, and other professions, with emphasis on development of word-building skills. No prior knowledge of Greek or Latin required. For undergraduates, particularly those in the sciences, interested in development of their technical vocabulary.

Classics 35A-B-C The Formation of Ancient Society (4-4-4) F, W, S. A unified view of the cultures of the Mediterranean world in antiquity. Focuses on major institutions and cultural phenomena as seen through the study of ancient literature, history, archaeology, and religion. Same as History 35A-B-C. (IV)

35A Origins of Ancient Society (IV)

35B Classical Greece (IV)

35C Ancient Rome (IV)

Classics 50A-B-C Classical Literature (4-4-4) F, W, S. A survey of Greek and Latin literature with attention to relations with social developments. (IV)

50A Greek and Roman Epic (IV)

50B Greek and Roman Drama (IV)

50C Greek and Roman Historians (IV)

Classics 99 Special Studies in Classics (4-4-4) F, W, S. Consultation with instructor necessary prior to enrollment.

Classics 111 The Thesaurus Linguae Graecae (4). Exposes undergraduate students to the history, objectives, and activities of UCI's Thesaurus Linguae Graecae Project, and to provide them with basic understanding of the principles and procedures inherent in computer application to literary texts. Prerequisite: one year of ancient Greek, or consent of instructor.

Classics 139 Writing in Classics (4). A course requiring at least 4,000 words of assigned composition based upon Greek and Latin texts in English translation, as well as upon pertinent secondary materials. Topics vary. Classics or Classical Civilization majors will

be given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

Classics 140 Classics and History: The Ancient World (4). Selected topics in society and culture of the Graeco-Roman world. May be repeated for credit provided topic varies. Readings in translation.

Classics 145 Introduction to Classical Archaeology (4). Range and variety of materials used as evidence for reconstruction or recovery of the Greek and Roman civilizations and methods by which information is inferred from artifacts. Emphasis on particular facets of daily life.

Classics 150 Classical Mythology (4). Selected myths and legends as used in classical literature, and their modern interpretations.

Classics 151 The Olympians (4). Examination of the origins and development of the Greek Olympian divinities with emphasis upon those who became central figures in pre-Christian religious cults.

Classics 160 Topics in Classical Literature in English Translation (4). Subject matter variable. May be repeated for credit provided topic varies.

Classics 165 New Testament Literature (4). Analysis of texts and their literary, historical, and religious contexts.

Classics 169 Ancient Literary Criticism (4). Study in English translation of the major literary critics in classical antiquity including Plato, Aristotle, Horace, "Longinus," and Quintilian. Designed particularly for students majoring in Comparative Literature, English, Classics, and the various languages.

Classics 170 Topics in Classical Civilization (4). Subject matter variable. May be repeated for credit provided topic varies.

Classics 198 Directed Group Study (4-4-4) F, W, S. Special topics in classical studies through directed reading and research. Consultation with instructor necessary prior to registration.

Classics 199 Independent Studies in Classics (4-4-4) F, W, S. Consultation with instructor necessary prior to registration.

Hebrew and Judaic Studies

Classics 2A-B-C Hebrew Reading and Composition (4-4-4) F, W, S. Not offered 1989-90. (V)

Classics 180A-B-C Judaic Studies (4-4-4) F, W, S. Jewish culture, history, and philosophy. Topics vary. May be repeated for credit provided topic varies.

Classics 181 Christian-Jewish Relations (4) S

Classics 182A-B-C The Epic of the Jews (4-4-4) F, W, S. Panorama of Jewish history highlighting great events, ideas, leaders, and interaction with other cultures. Sponsored by the Jewish Chautauqua Society in honor of Rabbi Edgar I. Magnin.

Graduate Courses

Classics 210A Proseminar (4) F. Introduction to tools and methods in various fields of classical studies, including textual criticism, literary criticism, epigraphy, papyrology, and semantics.

Classics 210B History of Greek Literature (4) W. An introductory overview of the history of Greek literature in its social and historical context.

Classics 210C History of Latin Literature (4) S. An introductory overview of the history of Latin literature in its social and historical context.

Classics 220 Classics Graduate Seminar (4-4-4) F, W, S. Subject matter variable; mainly but not exclusively major literary topics.

Classics 230 Directed Reading (4-4-4) F, W, S. Texts from the reading list; several topics each year.

Classics 240 Greek and Latin Language (4-4-4) F, W, S. Prose composition, translation, and language studies.

Classics 280 Independent Study (4). Supervised independent research. Subject varies.

Classics 290 Research in Classics (4-4-4) F, W, S

Classics 299 Dissertation Research (4-4-4) F, W, S

Classics 399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Department of English and Comparative Literature

Faculty

- Edgar T. Schell, Ph.D. University of California, Berkeley, *Chair of the Department and Professor of English* (medieval and Renaissance literature)
- Stephen A. Barney, Ph.D. Harvard University, *Professor of English* (medieval literature and culture, allegory)
- Homer Obed Brown, Ph.D. The Johns Hopkins University, *Professor of English* (eighteenth-century, novel, theory, Romanticism)
- James L. Calderwood, Ph.D. University of Washington, *Professor of English and Associate Dean of Graduate Studies, School of Humanities* (drama, Shakespeare)
- Michael P. Clark, Ph.D. University of California, Irvine, *Associate Professor of English* (Colonial American literature, critical theory)
- Stuart K. Culver, Ph.D. University of California, Berkeley *Assistant Professor of English* (nineteenth-century American literature)
- Jacques Derrida, Doctorat d'Etat es Lettres, Sorbonne, *Professor of Comparative Literature and French*
- Robert Folkenflik, Ph.D. Cornell University, *Professor of English* (eighteenth-century, novel, biography, and autobiography)
- Alexander Gelley, Ph.D. Yale University, *Professor of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory, comparative literature)
- Linda Georgianna, Ph.D. Columbia University, *Associate Professor of English* (medieval literature and culture)
- Oakley Hall, M.F.A. University of Iowa, *Professor of English and Director of the Program in Writing* (fiction writing, contemporary fiction)
- Carl Hartman, M.F.A. University of Iowa, *Senior Lecturer Emeritus in English* (fiction writing)
- Donald Heiney, Ph.D. University of Southern California, *Professor of Comparative Literature* (fiction writing, theory and criticism of fiction)
- John Hollowell, Ph.D. University of Michigan, *Lecturer in English and Writing Director* (rhetorical theory, teaching of composition, American literature)
- Rendé Riese Hubert, Ph.D. Columbia University, *Professor Emerita of Comparative Literature and French* (literature and fine arts, modern poetry, surrealism, Romanticism, comparative literature)
- Wolfgang Iser, Ph.D. University of Heidelberg, *Professor of English* (eighteenth-century English literature, modern novel, critical theory)
- Murray Krieger, Ph.D. Ohio State University, *Director of the University of California Humanities Research Institute and University Professor of English* (critical theory, Renaissance lyric, eighteenth-century figures)
- Julia Lupton, Ph.D. Yale University, *Assistant Professor of Comparative Literature* (Renaissance literature, literature and psychology)
- Juliet Flower MacCannell, Ph.D. Cornell University, *Associate Professor of Comparative Literature* (eighteenth-century French literature, modern semiotics, comparative literature)
- Lillian Manzor-Coats, Ph.D. University of Southern California, *Assistant Professor of Comparative Literature* (Latin-American literature, literature and art)
- James McMichael, Ph.D. Stanford University, *Professor of English and Director of the Writing Program in Poetry* (contemporary poetry, poetry writing, prosody, Joyce)
- J. Hillis Miller, Ph.D. Harvard University, *UCI Distinguished Professor of English and Comparative Literature* (Victorian literature, critical theory)
- Robert L. Montgomery, Ph.D. Harvard University, *Professor of English* (Renaissance literature, critical theory, comparative literature)
- Jane O. Newman, Ph.D. Princeton University, *Associate Professor of Comparative Literature* (sixteenth- and seventeenth-century German literature, contemporary theory and criticism, feminism)
- Robert Newsom, Ph.D. Columbia University, *Associate Professor of English* (Victorian literature, theory of fictions)
- Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature* (modern British literature)

- Robert L. Peters, Ph.D. University of Wisconsin, *Professor of English* (Victorian literature, contemporary poetry)
- Barbara L. Reed, Ph.D. Indiana University, *Lecturer in English and Assistant Vice Chancellor Academic Affairs for Administration and Academic Personnel* (American literature, children's literature)
- John Carlos Rowe, Ph.D. State University of New York, Buffalo, *Professor of English* (American literature, modern literature, critical theory, comparative literature)
- Gabriele Schwab, Ph.D. University of Konstanz, *Director of the Program in Comparative Literature and Professor of English and Comparative Literature* (modern literature, critical theory, psychoanalysis, comparative literature)
- Martin Schwab, Ph.D. University of Bielefeld, *Assistant Professor of Comparative Literature and Philosophy* (philosophy, aesthetics, comparative literature)
- Myron Simon, Ed.D. University of Michigan, *Professor of English and Education* (American and Canadian literature, early twentieth-century English poetry, ethnic literature, rhetoric)
- Owen Thomas, Ph.D. University of California, Los Angeles, *Professor of Linguistics, English, and Education* (history of English, American literature)
- Harold Toliver, Ph.D. University of Washington, *Professor of English* (Renaissance and seventeenth-century literature, theory of genre)
- Albert O. Wlecke, Ph.D. Michigan State University, *Associate Professor of English* (English and American Romanticism, teaching of composition)

The Department of English and Comparative Literature is concerned with the nature and value of literature, possible approaches to literary works, and the relation of literary criticism to the intellectual issues of the day. Fundamentally it is concerned with the humanistic problem of value. Thus its main literary concern is critical and theoretical. Though not alone in the task, the Department recognizes a continuing obligation to help all students write the English language with clarity and grace.

Students are given the opportunity to participate in departmental affairs through two elected student committees, one of undergraduates, one of graduates. The committees meet periodically with faculty committees of the Department, and the recommendations of student committees become matters of record which accompany any recommendations emanating from the Department. Each quarter all students taking classes within the Department have the opportunity to evaluate the particular course and teacher.

Careers for the English or Comparative Literature Major

The study of literature helps students to express their ideas clearly, do independent research, and think analytically and imaginatively. These capabilities will help qualify majors for careers in education, law, technical writing, communications, journalism, public relations, business, and management. An undergraduate major in either English or Comparative Literature is also an especially good preparation for graduate study.

Department advisors encourage their students to investigate various careers—especially those outside the traditional fields for such majors (e.g., graduate study and law)—before these students have completed their undergraduate educations.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Undergraduate Program

The Department offers to the undergraduate three areas of study:

The Program in Literary Criticism, which emphasizes a variety of critical approaches in the reading and criticism of English, American, and comparative literature.

The Program in Writing, which offers an emphasis in the writing of poetry or fiction. Undergraduate courses in journalism and nonfiction are also available, including formal instruction and workshop experience for staff members of the campus newspaper. The aim of the program is to encourage the creative powers of students while introducing them to the discipline of reading and practical criticism, often in workshop situations. Under certain circumstances, creative writing courses may satisfy part of the writing requirement portion of the UCI breadth requirement (Category I). See page 54.

The Program in Comparative Literature, which though administratively a part of the Department, is basically interdisciplinary in its orientation, drawing on faculty and other resources from the fields of the various modern and classical literatures and drama. The consciousness of the modern educated person is the product of centuries of cultural heritage, including not only works of literature in one's own language but world literature from Homer to Gide and Thomas Mann. At UCI, Comparative Literature is regarded as the study of literature from the international point of view rather than in a national framework. A student who completes a degree in Comparative Literature will be expected to have a grasp of the history of literature in its broad outlines and to be able to deal competently with literary texts, whatever their period or national origins. Comparative Literature is well-suited for students interested in a double major.

Since the Department believes that a student of literature should recognize the importance of understanding theoretical problems in literature, of developing a broad acquaintance with literary texts, and of experiencing the problems of literary creation at first hand, the Department invites students to take work in all three of its programs, with an emphasis in one of the first two (toward a Bachelor's degree in English) or a major in the third (toward a Bachelor's degree in Comparative Literature).

Many of the courses will vary in specific content from year to year, depending on the plans of individual teachers, since the Department recognizes that no course can treat all the major authors and works relevant to a given period or topic.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the English Major

Two courses from the E 28A-B-C or CL 50A-B-C groups (including either E 28A or CL 50A) and a third course either from those two groups or from E 6, 7, 8 or CL 8; CR 100A; CR 100B and CL 100 (approved seminars from the course groups numbered in the 103s and 104s may be substituted for these courses); at least four courses from the E 101 group; at least five Department courses numbered above 101, not counting E 140, 150, or WR 179; competence in a foreign language, either classical or modern, equivalent to six quarters of work at Irvine (in classical languages, 1A-B-C and Greek or Latin 100 three times, though Greek or Latin 25 may be substituted for one of the 100 courses), plus (in modern languages) one course in a foreign literature in which

texts are read in the original language. Students selecting a writing emphasis have some flexibility in substituting writing workshops for period and genre courses; their total courses normally number more than the usual major.

Residence Requirement for the English Major: CR 100A, CR 100B, and three E 101s must be completed successfully at UCI.

Departmental Requirements for the English Minor

Three courses selected from E28A-B-C, CL50A-B-C, or E6, 7, 8 sequences, including at least one quarter of E28; and at least five English or writing courses numbered 101 or higher, although two courses from the following may be substituted: CR100A, CR100B, WR100B, CL100, CL104.

Residence Requirement for the English Minor: Four upper-division courses must be successfully completed at UCI.

Departmental Requirements for the Comparative Literature Major

Sufficient competence in a foreign language, either modern or classical, to be able to read any standard literary or critical text in that language. If the student intends to continue with graduate work, the study of a second foreign language is highly recommended before graduation.

Three quarters of lower-division work: Comparative Literature majors are normally required to take CL 50A-B-C.

Transfer students may be required to take one or more courses in the sequence depending on the courses they have taken previously.

Normally 10 upper-division courses in addition: usually these will include CR 100A, CL 100 twice, two courses (one 101 and one above 101) in a selected foreign language, or two 101s in two different foreign languages, or two years of a classical language; two courses from CL 103 or CL 104; three additional upper-division courses chosen from the offerings in comparative literature, English, literary criticism, and creative writing. Courses in allied areas, e.g., history, philosophy, social science, may be counted toward the major if they deal with literary or philosophical texts, though prior approval of a faculty advisor is necessary.

The Comparative Literature Program maintains a comprehensive reading list in world literature, on which CL 50A-B-C is based. Students may, *by prior arrangement with the Director of the Program*, take an examination on one or more parts of the list and thereby become exempt from one or more quarters of CL 50A-B-C.

Residence Requirement for the Comparative Literature Major: CR 100A and four upper-division English or Comparative Literature courses must be completed successfully at UCI.

Departmental Requirements for the Comparative Literature Minor

CL50A-B-C, CR100A, CL100, CL103 or 104 (three courses), and one upper-division literature course taught in a foreign language.

Residence Requirements for the Comparative Literature Minor: Four upper-division courses must be successfully completed at UCI.

Planning a Program of Study

Students should plan, with their faculty advisors, coherent programs of study, including undergraduate seminars, workshops in writing (for students choosing a writing emphasis), and courses in allied areas outside the Department. It is possible to combine a cluster of courses in literature with other majors in the sciences and social sciences, and to use an English or Comparative Literature major as preprofessional training in government, law, medicine, etc. Students who wish advice in planning such programs should consult both the Department and people in their prospective professional areas.

Students who intend to pursue a single subject or multiple subject teaching credential must consult with Professor Myron Simon (as well as with the Office of Teacher Education) to ensure that they understand the departmental and State requirements.

A student who intends to continue with graduate work is urged to study a second foreign language before graduation.

Graduate Program

The Department's three principal areas of work on the undergraduate level—English and American Literature, Comparative Literature, and the English major with writing emphasis—are reflected in the graduate programs: the M.A. and Ph.D. in English, the M.A. and Ph.D. in Comparative Literature, and the M.F.A. in English (Creative Writing). A student's courses for the M.A. and Ph.D. in English may include or emphasize work in American literature as well; and the faculty is particularly equipped to guide students with special interests in criticism and theory, an area which candidates for the Ph.D. in English or in Comparative Literature may stress in their qualifying examinations and dissertations. Ordinarily students are not admitted to the English or Comparative Literature programs unless they plan to continue, and are qualified to continue, to the degree of Ph.D. Students are admitted to the M.F.A. program chiefly on the basis of submitted creative work. A committee of the Department, with the consent of the Dean of Graduate Studies, admits students to these programs. Each program has a director appointed by the Department Chair. A deliberate effort is made to maintain close administrative and intellectual ties among the programs.

Specific requirements for the graduate degrees will be reached by consultation between members of the faculty and the candidate. The first-year graduate student or the candidate for the Master of Fine Arts in English (Creative Writing) plans a program with an assigned advisor; candidates for the Ph.D. plan with an advisor and three-person committee. At the time of the M.A. examination, the Graduate Committee evaluates the student's graduate career up to that point and offers advice about future prospects. Candidates for literary degrees are encouraged to study philosophy, history, foreign languages and literatures, and the fine arts.

Applicants for graduate degrees in English and Comparative Literature must submit scores for the Graduate Record Examination (GRE) including the Subject Literature in English Test; applicants must also submit sample papers and a statement about competence in foreign languages.

Only in exceptional circumstances will students be permitted to undertake programs of less than six full courses during the academic year. The normal expectation, however, is enrollment in three courses each quarter, except for Teaching Assistants, who take two courses in addition to earning credit for University teaching. Students who are not teaching

should be able to complete course work in two years. The Ph.D. qualifying examination should be taken within a couple of quarters after courses are finished. Dissertations can frequently be written in a year. The Ph.D. in English or the Ph.D. in Comparative Literature normally should be completed in six years or less.

The Department recognizes that many of its graduate students intend to become teachers, and it believes that graduate departments should be training college teachers as well as scholars—indeed, that teaching and most literary scholarship complement one another. Thus the Department has initiated a program by which all its Ph.D. candidates, in English as well as in Comparative Literature, may gain supervised training as part of the formal seminar work required for the degree. M.F.A. candidates also have the opportunity to participate in this program. Candidates for the Ph.D. are expected to acquire experience in teaching.

All those interested in graduate study in the Department should obtain the brochure on graduate programs from the departmental office.

English

Master of Arts in English

Each candidate for the M.A. will be assigned to a graduate advisor who will supervise the student's program. The M.A. plan of study includes (1) the completion of course work, as advised, for three quarters or the equivalent; (2) demonstrated proficiency in reading a designated foreign language, modern or classical; and (3) the submission of materials (including a statement about work accomplished and plans for future study, and a sample essay) to the Graduate Committee, who will review and assess the student's progress, recommend whether further study toward the Ph.D. is advisable and, if so, give advice about areas for further study.

Master of Fine Arts in English

The Master of Fine Arts (M.F.A.) is a degree in creative writing.

The M.F.A. degree is normally conferred upon the completion of a two-year residence. Each quarter the candidate will be enrolled in either the poetry or fiction section of the Graduate Writers' Workshop, which will constitute two-thirds of a course load, the other course to be selected in consultation with the student's advisor. It is expected that M.F.A. candidates will complete at least one supervised teaching seminar.

In addition to course work, the candidate is required to pass an examination on a reading list of literary works in the genre selected, and to present as a thesis an acceptable book-length manuscript of poetry or short stories, or a novel.

Doctor of Philosophy in English

The program for the Ph.D. in English requires about two years of full-time enrollment in regular courses beyond the B.A. (two courses of which may be in the graduate teaching program); proficiency in the reading of two acceptable foreign languages, modern or classical; the dissertation; and satisfactory performance on designated examinations.

The languages acceptable depend upon the nature of the student's program as determined by the student's advisors. Reading competence in one of these languages must be established in the first year of residence, and competence in the second well before the general examination.

Students admitted at the post-M.A. level must provide evidence of satisfactory competence in foreign languages. Competence in one of the two languages required for the Ph.D. is

verified through a course in theory and practice of translation; the other language may be verified through examination.

Upon completion of course work the student takes general examinations on literary theory and criticism; some particular literary form, genre, style, theme, or structure; a historical period; a group of authors; and a specific topic. The first four of these examinations are written; the fifth is oral. The student has the opportunity to present personal choices for the examination, but the choices must enable an individual to demonstrate breadth of knowledge as well as literary understanding and therefore must be approved by the advisory committee.

Upon satisfactorily completing the general examination and the oral Qualifying Examination, the student is admitted to candidacy for the degree. As soon after completion of the general examination as is practical, the student presents an essay leading to dissertation for the approval of the doctoral committee. The dissertation itself must also be approved by the committee, which may or may not require an oral examination on it. All work for the Ph.D. degree must be in courses limited to graduate students.

Comparative Literature

There are at least four avenues by which the student may approach graduate work in Comparative Literature:

1. An undergraduate major in Comparative Literature equivalent to the one described above;
2. An English major, provided that a sufficient background in at least one foreign language is demonstrated (a beginning on a second foreign language is desirable);
3. A normal major in drama, with same proviso as above;
4. A normal major in a foreign language, provided that a sufficient general background in world literature is demonstrated.

Make-up work will be required before graduate studies can begin if one of these avenues has not been taken.

At the graduate level, the study of Comparative Literature becomes more specialized, with the student engaged in a particular area of research and concerned with such problems as the development of genres, interrelations between literatures, the theory and practice of translation, and other literary questions transcending national boundaries.

For the graduate student in Comparative Literature a professional competence in foreign languages is essential. French and German are usually required for all doctoral candidates, since these languages along with English are the accepted tools of international literary scholarship. A classical language may prove indispensable for work in many traditional fields of literary study, and the scholar's own specialty may require the mastery of other languages. The underlying assumption of language requirements is that, after the tool languages have been mastered, the professional scholar's own interests should determine the specific kinds and degrees of language skill to be acquired.

At the graduate level, the nucleus of the foreign language requirement is the course CL 220 (Problems in Translation) in which, after a suitable theoretical preparation, the student plans and carries out a high-quality translation of a literary text. The translation, along with an introduction or other scholarly apparatus explaining and defending the technical decisions involved in the task, is then submitted as a paper for course credit.

Master of Arts in Comparative Literature

Students entering the Master of Arts program should complete their course work in three quarters. This course work should include CL 220 (Problems in Translation) with a project in either French or German and appropriate graduate-level work in English, foreign languages, drama, comparative literature, and other areas as recommended by the advisor. Soon after beginning graduate work the student, with the advice and approval of the assigned advisor, will decide on a field of specialty, which will be emphasized in progressing toward the M.A. degree. (Normally this choice will be a preliminary step toward the selection of an area of specialty for the Ph.D.)

Graduate study in Comparative Literature requires an exceptional facility in foreign languages, and the student should not attempt a Master's degree without a thorough knowledge of one foreign language and literature and a considerable knowledge of a second language. Normally the greatest part of the student's work will involve the study of literary texts in the original languages.

At the end of course work, normally about nine courses at the graduate level, the student will be examined on a reading list in world literature that the student's committee has approved. This list should be designed by the student in consultation with the committee and based on the general World Literature list for Comparative Literature. The student's own list should follow some organizing principle, such as an emphasis on the fields and languages of the student's specialization. Nevertheless, every list should include works from all of the different groups represented on the general World Literature list. The M.A. examination is a three-hour written examination, which focuses on essay questions based on the student's approved reading list. Exceptional students may be exempted from taking the examination by petitioning the Graduate Committee, which will review the student's performance and qualifications in arriving at its decision.

Doctor of Philosophy in Comparative Literature

The doctoral program is designed to prepare the student for a professional career as a scholar and critic of literature. Details of the doctoral program in Comparative Literature may be obtained from the Director of the Program in Comparative Literature. Normally the degree requires two years of course work (usually a minimum of three courses per quarter). Of these courses, the only required course is CL 220 (Problems in Translation), which is taken twice, with projects in acceptable languages. The rest of the student's work will be in seminars or other graduate-level courses in Comparative Literature, English, the various foreign language departments, or drama.

In general an exceptional command of foreign languages is required, normally involving a professional competence in two or more foreign languages, either modern or classical. The doctoral student is encouraged to design and carry out a personal plan of study (the area of specialty) in a particular field of interest. The requirements for the doctorate also include an area of competence in literary theory and practical criticism; a student may also stress theory in preparation for the Qualifying Examination.

Upon completion of the course work, the student will be examined in the following areas of knowledge: (1) mastery of a limited topic in literary theory or history of criticism, along with general knowledge of major critical texts in the history of literature; (2) an area of specialty as described above; and

(3) major works and authors appropriate to the study of comparative literature. Following this examination, and upon recommendation of a candidacy committee appointed by the Graduate Dean on behalf of the Graduate Council, the student is formally admitted to candidacy.

The study toward the degree of Doctor of Philosophy will culminate in the writing of a suitable dissertation, normally on a comparative subject, although subjects lying within a single literature or dealing with general literary and aesthetic problems not confined to any specific literatures may also be acceptable. Studies of the relation between literature and the other arts are also encouraged.

Undergraduate Courses

Satisfaction of the Subject A requirement is a prerequisite for all departmental courses except E 6, E 7, E 8, and CL 8. See page 52 for information on fulfilling the Subject A requirement.

Descriptions of the topics to be offered in the undergraduate literary courses during a given year are available in the departmental office in the fall.

E 6 Major British Writers: Chaucer to Pope (4) F, Summer. Lecture, three hours. Reading of major works by such figures as Chaucer, Shakespeare, Milton, Swift, Pope, and others. Primarily designed for nonmajors. (IV)

E 7 Major British Writers: Wordsworth to Joyce (4) W, Summer. Lecture, three hours. Reading of major works by such figures as Wordsworth, Keats, the Brontës, Dickens, Arnold, Joyce, and others. Primarily designed for nonmajors. (IV)

E 8 Major American Writers (4) S, Summer. Lecture, three hours. Reading of major works by such figures as Emerson, Hawthorne, Melville, Whitman, Twain, James, Eliot, Faulkner, and others. Primarily designed for nonmajors. (IV)

CL 8 Major European Authors (4) W. Comparative study of two or more European writers related by genre, style, etc., for instance, Balzac and Dickens, Kafka and Beckett. May be substituted for one quarter of the E 6, 7, 8 series.

E 28A-B-C The Nature of Literature (4-4-4) F, W, S. Discussion, three hours. **28A:** The Poetic Imagination; **28B:** Comic and Tragic Vision; **28C:** Realism and Romance. Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short papers in each course. (IV)

WR 30 The Art of Writing: Poetry (4) F, W, S, Summer. Beginners' workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings. May be repeated once for credit with a different instructor. (I)

WR 31 The Art of Writing: Prose Fiction (4) F, W, S, Summer. Beginners' workshop in fiction writing, evaluation of student manuscripts, and parallel readings. May be repeated once for credit with a different instructor. (I)

WR 32 The Art of Writing: Drama (4). Beginners' workshop in playwriting, evaluation of student manuscripts, and parallel readings. Same as Drama 32. (I)

WR 38 The Art of Writing: Nonfiction and Journalism (4) F, W, Summer. Beginners' workshop in the writing of nonfiction and news articles, evaluation of student manuscripts, projects. (I)

WR 39A Fundamentals of Composition (0-2) F, W, S, Summer. Discussion, three hours. Deals with the fundamentals of grammar, usage, paragraph development, principles of rhetoric, and the writing of expository essays. Some exercises; frequent papers. A student seeking to satisfy the Subject A requirement who receives a grade below C must repeat the course, normally in the next quarter of residency. A student who satisfies the Subject A requirement during WR 39A and achieves a grade of C or above in WR 39A will earn two units of baccalaureate credit. Students held for Subject A must satisfy the requirement within the first three quarters of residency.

WR 39B Expository Writing (4) F, W, S, Summer. Discussion, three hours. Guided practice in the writing of expository prose. Readings selected from current fiction and nonfiction; writing topics require

analysis of the readings and demonstration of rhetorical principles. Prerequisite: English and Comparative Literature WR 39A or the equivalent. (I)

WR 39C Argument and Research (4) F, W, S, Summer. Discussion, three hours. Guided writing practice in argumentation, logic, and inquiry. Readings are selected from current nonfiction and from materials students select from the University library. Research strategies emphasized. Prerequisite: English and Comparative Literature WR 39B. (I)

CL 40A-B-C Development of Drama (4-4-4) F, W, S. Same as Drama 40A-B-C. (IV)

CL 50A-B-C The Literary Tradition (4-4-4) F, W, S. The reading of selected major works in the Western literary tradition. Required of Comparative Literature majors. (IV)

CL 100 Undergraduate Seminar in Literary Theory and Practice (4) F, W, S. Seminar, three hours. Open to upper-division majors in English and Comparative Literature only, and required of them. Sections limited to 15 students. Each instructor announces a topic that joins theoretical considerations of comparative literary study with the practical criticism of individual literary texts. May be repeated as the topics change. Prerequisite: a lower-division series in literature.

CR 100A Literary Theory and Criticism (4) F. Required of beginning majors in English and Comparative Literature. A series of lectures and discussions devoted to the theoretical dimensions of literary criticism as reflected in major theorists from Plato to the present. Prerequisite: a lower-division series in literature.

CR 100B Undergraduate Seminar in Literary Theory (4) W, S. Seminar, three hours. Open to upper-division majors in English and Comparative Literature only, and required of them soon after the completion of CR 100A. Sections limited to 15 students. Each instructor announces a theoretical topic deriving from CR 100A and explores it through a number of theoretical and literary texts. May be repeated as the topics change. May be cross-listed with CR 139 when the topic is appropriate. Prerequisite: English and Comparative Literature CR 100A.

CR 100C Contemporary Critical Theory (4) W, S. Lecture, three hours. Discussion of contemporary critical theory. Enrollment limited to 25 students. Prerequisite: English and Comparative Literature CR 100A.

WR 100B Undergraduate Seminar in Literary Theory (4). Seminar, three hours. Substitute for CR 100B for writing emphasis students. Prerequisite: English and Comparative Literature CR 100A.

E 101 English and American Literary History (4) F, W, S, Summer. English majors are required to take four different E 101 courses. Topics are announced by instructors, but the E 101 curriculum is offered in such a way as to cover the following periods in any two-year academic cycle: Medieval, Renaissance (through 1660), Restoration and eighteenth century, Romanticism and Victorian, nineteenth-century American, Anglo-American Modernism. Required of English majors with junior or senior standing. May be repeated as topics vary.

E 103 Undergraduate Lectures in English Literature (4) F, W, S, Summer. Three hours. May be taken more than once provided the topic changes. A series of lectures on and discussions of announced topics in literary criticism, history, genres, modes, major authors. Prerequisite: none for most topics; check descriptions of individual course topics.

CL 103 Undergraduate Lectures in Comparative Literature (4) F, W, S, Summer. Three hours. May be taken more than once provided the topic changes. A series of lectures on and discussions of announced comparative topics in literary criticism, history, genres, modes, major authors. Prerequisites: none for most topics; check descriptions of individual course topics.

CL 104 The Interdisciplinary Course (4) F, W, S. Lecture and discussion course open to all students, three hours. May be taken more than once provided the topic changes. Treats interdisciplinary topics of various kinds (e.g., literature and politics, literature and religion, literature and science, literature and other arts). Prerequisites: none for most topics; check descriptions of individual course topics.

WR 109 Nonfiction and Journalism (4) S. Three hours. The course develops out of WR 38 for students with special competence for advanced work in journalism. Prerequisite: consent of instructor.

WR 110 Short Story Writing (4) F, W, S, Summer. Three-hour workshop in short fiction; discussion of student writing and of relevant literary texts. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 111 Poetry Writing (4) F, W, S, Summer. Three-hour advanced poetry writing workshop; discussion of student writing and of relevant literary texts. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 112 Playwriting (4). Three-hour advanced playwriting workshop; discussion of student writing and of relevant literary texts. Prerequisite: consent of instructor. Same as Drama 112.

WR 113 Novel Writing (4) S. Three-hour advanced workshop in fiction writing; discussion of student writing and of relevant literary texts. Prerequisite: consent of instructor.

WR 115 Conference in Writing (4). Primarily for writing emphasis seniors. May be repeated for credit toward graduation but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 139 Advanced Expository Writing (4) F, W, S, Summer. Discussion, three hours. Study of rhetorical techniques; practice in writing clear and effective prose. Several essays of varying lengths, totaling at least 4,000 words. Prerequisites: satisfaction of the lower-division writing requirement of the breadth requirement and junior standing. (I)

E 139E Critical Writing: Topics in English Literature (4) F, W, S, Summer. Discussion, three hours. Study and practice of critical writing on various topics in English literature. Four essays of varying lengths, totaling at least 4,000 words. Open to all juniors and seniors; priority given to English majors. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

E 139F Critical Writing and the Craft of Fiction (4) F, W, S, Summer. Study and practice of various fictional forms and the critical understanding of these forms. Critical essays and exercises in aspects of the craft of fiction, totaling at least 4,000 words. Priority given to writing-emphasis majors in English and Comparative Literature. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

E 139P Critical Writing and Poetic Practice (4) F, W, S, Summer. Study and practice of various poetic forms and the critical understanding of these forms. Critical essays and poetic exercises of varying lengths, totaling at least 4,000 words. Priority given to writing-emphasis majors in English and Comparative Literature. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

CL 139 Critical Writing: Topics in Comparative Literature (4) F, W, S, Summer. Study and practice of critical writing on various topics in comparative literature. Four essays of varying lengths, totaling at least 4,000 words. Open to all juniors and seniors; priority given to Comparative Literature majors. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

CR 139 Critical Writing: Topics in Literary Theory (4) W, S. Study and practice of critical writing on various topics in literary theory. Four essays of varying lengths, totaling at least 4,000 words. Restricted to English and Comparative Literature majors. May be cross-listed with CR 100B when the topic is appropriate. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

E 140 Children's Literature (4) F. Lecture course open to all students. Explores the nature of children's literature and the special critical problems raised by it. Primarily for nonmajors. May not be counted toward the upper-division requirements for English or Comparative Literature majors.

E 150 Topics in Literature for Nonmajors (4). Lecture, three hours. Major texts in English, American, and Comparative Literature

explored for basic humanistic issues and themes, on announced topics. Primarily for upper-division students, but not requiring previous training in literature. May be repeated as topics change. May not be counted toward the upper-division requirements for English or Comparative Literature majors.

WR 179 Advanced Composition for Teachers (4). Principles of formal composition and teaching composition. Selected handbooks and ancillary reading, marking papers, making assignments, and conducting workshops and tutorials. May not be counted toward the upper-division requirements for English or Comparative Literature majors. Same as Education 179.

E 181 The Structure of English (4). An examination of American English phonology, morphology, and syntax. Intended primarily for prospective teachers of English in elementary and secondary schools and for teachers of English as a second language. Prerequisite: Linguistics 50 or equivalent. Same as Linguistics 162 and Social Sciences 144E.

E 184 History of English (4). External (historical and social) and internal (linguistic) changes which have affected the English language from its Germanic roots to the present day. Recommended: Linguistics 50 or equivalent. Same as Linguistics 132 and Social Sciences 143B.

E 187 Selected Topics in English Linguistics (4)

E 198 Special Topics (4-4-4). Directed group study of selected topics. By consent, by arrangement.

E 199 Reading and Conference (4-4-4). To be taken only when the materials to be studied and the topic to be pursued lie outside the normal run of departmental offerings, when the student will have no formal chance in the course of several years to pursue the subject of interest, and when the subject fits significantly into the student's major program. Prerequisites: consent of the student's advisor, the course instructor, and the Department Chair; the student must submit a written description of the course to the Chair.

CL 198 Special Topics (4-4-4). Directed group study of selected topics. By consent, by arrangement.

CL 199 Reading and Conference (4-4-4). See the description of E199 above.

Graduate Courses

All graduate courses may be repeated when the topic varies. Descriptions of the topics to be treated in a given academic year are published by the Department in the fall. Enrollment in each graduate course requires the consent of the instructor. The courses are limited to registered graduate students, except for specially qualified fifth-year students seeking teaching credentials, who may enroll if they have first received permission from the Department's Graduate Committee and if space permits.

In addition to the following courses, graduate students in the Department of English and Comparative Literature might find these Humanities courses of special interest: Humanities 200 (The Nature and Theory of History); Humanities 210 (Approaches to Linguistic Study); Humanities 230 (Philosophical Analysis); and Humanities 291 (Interdisciplinary Topics).

E 200 Selected Topics in English Linguistics (4)

CL 200 Methods of Comparative Literature (4) F. Introduction to comparative literary study required of first-year graduate students in Comparative Literature. Study of representative theories of the discipline.

E 210 Studies in Literary History (4) F, W, S

CL 210 Comparative Studies (4) F, W, S

CL 220 Problems in Translation (4) F, W, S

CR 220A-B-C Studies in Literary Theory and Its History (4-4-4) F, W, S. CR 220A same as Humanities 220.

- E 225 **Studies in Literary Genres** (4) F, W, S
 E 230 **Studies in Major Writers** (4) F, W, S
 E 235 **Methods of Literary Scholarship** (4)
 CR 240 **Advanced Theory Seminar** (4) F, W, S
 WR 250A-B **Graduate Writers' Workshop (Fiction)** (4-4) F, W, S
 WR 250C **Graduate Writers' Workshop (Poetry)** (8) F, W, S. Satisfactory/Unsatisfactory only.
 WR 251A-B **Writing in Conference (Fiction)** (4-4) F, W, S
 WR 251C **Writing in Conference (Poetry)** (8) F, W, S. Satisfactory/Unsatisfactory only.
 E 290 **Reading and Conference** (4) F, W, S
 CL 290 **Reading and Conference** (4) F, W, S
 E 291 **Guided Reading Course** (4)
 CL 291 **Guided Reading Course** (4)
 E 299 **Dissertation Research** (4 to 12) F, W, S. Satisfactory/Unsatisfactory only.
 CL 299 **Dissertation Research** (4 to 12) F, W, S
 E 398 **Rhetoric and the Teaching of Composition** (4) F. Readings, lectures, and internship designed to prepare graduate students to teach composition. Formal instruction in rhetoric and practical work in teaching methods and grading. Consent of instructor required.
 E 399 **University Teaching** (4-4-4) F, W, S. Required of and limited to Teaching Assistants. Satisfactory/Unsatisfactory only.

Program in Film Studies

Faculty

- Eric Rentschler, Ph.D. University of Washington, *Director of the Program and Professor of German* (German film, history, criticism, and theory)
 Homer Obed Brown, Ph.D. The Johns Hopkins University, *Professor of English* (film theory, American film, popular culture)
 David Carroll, Ph.D. The Johns Hopkins University, *Professor of French and Italian* (film history and criticism, French cinema, film and society)
 Anne Friedberg, Ph.D. New York University, *Assistant Professor of Film Studies* (film history and theory, film and postmodernism, avant-garde and experimental film)
 Renée Riese Hubert, Ph.D. Columbia University, *Professor Emeritus of Comparative Literature* (surrealist film/fantastic film, early comedy)
 Alejandro Morales, Ph.D. Rutgers University, *Professor of Spanish* (Latin American film)
 Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (Spanish cinema)
 John Carlos Rowe, Ph.D. State University of New York at Buffalo, *Professor of English* (film and documentary images of war, film theory)
 Franco Tonelli, Ph.D. Louisiana State University; Laurea, University of Catania, *Professor of Film Studies and Drama* (French and Italian cinema, theory, criticism, genre)
 Linda Williams, Ph.D. University of Colorado, *Professor of Film Studies* (film history, theory, and genre; women and film, feminist theory, mass culture)

The expressive media, film and television, significantly shape our access to the modern world. Film Studies seeks to comprehend the appeal, function, and changing character of these aural and visual forms, and to consider how they affect our understanding and experience.

The Program in Film Studies provides a systematic and comprehensive exposure to cinema, television, and modern media. The curriculum is composed of a coherent sequence of courses which span the film medium's connection to other art forms, its historical development, and its function as an institution and an industry. The Program familiarizes students with the history, theory, and aesthetics of cinema, a wide array of national cinemas, and individual filmmakers, period styles, and genres. Additional course work acquaints

students with the practical and technical aspects of film production and scriptwriting. The curriculum is complemented by regular film series, visits from directors and scholars, and critical symposia.

The School of Humanities charges a laboratory fee of \$20 per course to all students taking Film Studies courses.

Film Studies students have the opportunity to spend their junior year in France studying at the Inter-University Center for Film and Critical Studies in Paris, through the University's Educational Abroad Program. Information is available both in the Film Studies Office and the Education Abroad Program Office.

Career Opportunities

In addition to providing students with a solid grounding in humanistic studies, a degree in Film Studies prepares students to seek a career as a film educator, to attend graduate school in film studies, to continue literary studies connected with film, and to work in the rapidly growing entertainment industry, in either its commercial or independent sectors.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Program Requirements for the Major: Film Studies 50A, 101A-B-C, 102, 110A-B-C, 112, 113, 114, 115; and three courses (of varying topics) from Film Studies 160. Film Studies 198 may be substituted for one or two of the Film Studies 160 Courses.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Program Requirements for the Minor: Seven upper-division courses: Film Studies 101A-B-C, 112, 115, and two courses (of varying topics) from Film Studies 160.

Residence Requirement for the Minor: Four upper-division courses must be successfully completed at UCI.

Lower-Division Courses in Film Studies

40 Film Art Symposium (4) S. Weekly guest film artists present their work. Discussion of formal, stylistic, and practical problems of commercial and independent production. Formerly Film Studies 50C.

50A Basic Film Production (4) F. Introduction to the basic film apparatus. The elementary essentials of production, including the use of camera and lenses, film stock, and lighting, as well as editing and sound.

50B Advanced Film Production (4) W. Students produce individual film projects, utilizing skills and insights introduced in Film Studies 50A. Prerequisite: Film Studies 50A.

Upper-Division Courses in Film Studies

101A-B-C History of Film

101A The Silent Era (4) F. An investigation of the technological, economic, social, and aesthetic determinants of the cinema in its first 30 years. The formal strategies and historical importance of films by Méliès, the Lumières, Porter, Griffith, Murnau, Lang, Eisenstein, Pudovkin, and others.

101B The Sound Era I (4) W. Continues the investigation of formal strategies and historical contexts pursued in Film Studies

101A. Concentration on a range of national cinemas prior to and after World War II, scrutinizing films by Renoir, Welles, Riefenstahl, Hawks, Kazan, Rossellini, and others. Prerequisite: Film Studies 101A or consent of instructor.

101C The Sound Era II (4) S. An investigation of a variety of changes in narrative structure and cinematic technique which has taken place in the last 25 years. Frames aesthetic questions in political, social, and economic terms. Films by Godard, Antonioni, Fellini, Fassbinder, Wenders, Sembene, and others. Prerequisite: Film Studies 101B or consent of instructor.

102 History of Television (4) F, W, S. Development of television as a mass medium and a distinctive form of representation. Spans the history of the medium since the 1940s, concentrating on television as an expressive form and an institution, subject to a series of socio-political, aesthetic, and economic determinants.

110A-B-C Theory of Film

110A Classical Film Theory (4) F. Close readings in a seminar-style atmosphere of major texts by Arnheim, Balázs, Eisenstein, Bazin, Benjamin, Horkheimer/Adorno, Kracauer, and others. Same as Humanities 174B.

110B Contemporary Film Theory (4) W. Acquaints students with the central questions of contemporary film theory. Readings of key texts concerned with semiotic, post-structural, psychoanalytical, and feminist approaches to film studies. Prerequisite: Film Studies 110A or consent of instructor. Same as Humanities 174C.

110C Applied Film Theory (4) S. In-depth readings of studies devoted to single films and directors which reflect the interests of contemporary film theory. Prerequisite: Film Studies 110B or consent of instructor. Formerly Film Studies 111.

112 Studies in Film Genre (4) F, W, S. Theoretical discussion of what constitutes the patterns of recognition and serial productions we call "genre" films. Case studies of particular film genres, e.g., westerns, musicals, melodramas, and horror films. Prerequisite: Film Studies 101A-B-C or consent of instructor. Same as Humanities 174A.

113 Film, Literature, and Narrative (4) S. Concerned with the narrative cinema, i.e., film and how it functions as a storytelling medium. Deals with exchanges between film and literature, scrutinizing how the evolving nature of these relationships have conditioned the development of both cinematic and literary narrative. Prerequisite: Film Studies 101A-B-C or consent of instructor.

114 Film and the Other Arts (4) W. Reading of theoretical writings (psychological, aesthetic, semiotic, social) applicable to film and other visual arts, leading to a comparative study of image, space, and time. Texts of authors such as Benjamin, Arnheim, Kracauer, Artaud, Barthes, Gombrich, and Krauss are analyzed. Prerequisite: Film Studies 101A-B-C or consent of instructor. May be repeated for credit if topic varies.

115 Studies in Film Authorship (4) F, W, S. Theoretical scrutiny of the problem of authorship in film. Case studies of single directors/producers/artists and a larger body of films, e.g., Renoir, Riefenstahl, Ford, Godard, Fassbinder, and others. Prerequisite: Film Studies 101A-B-C or consent of instructor.

117A Script Writing (4) F. Writing the short script. Form, structure, and planning. Preparation of scripts for short films: dramatic, documentary, experimental, and other forms. Class assignments and completion of three short scripts.

117B Script Writing and Film Adaptation (4) W. Substantial novels being translated into treatment form, discussed in workshop, along with novels successfully turned into screenplays. Students dramatize scenes from their own treatment and write a paper on a problem of film adaptation. Prerequisite: lower-division writing course. Enrollment limited to 20 students.

117C Advanced Screenwriting (4) S. Continuation of exercises initiated in Film Studies 117A with concentration on alternative approaches to screenwriting, e.g., nontraditional narratives, non-narrative features, experimental explorations. Prerequisite: Film Studies 117A or consent of instructor.

160 National Cinemas (4) F, W, S. Study of the film production of individual nations, concentrating particularly on period styles and "schools." Examples include the French Nouvelle Vague, the New

German Cinema, Italian Neorealism, and Classical Hollywood Cinema. Same as French 160, German 160, Italian 160, Russian 160, and Spanish 160. May be repeated for credit when topic varies.

198 Special Topics in Film Studies (4) F, W, S. Exploration of special issues concerned with film history and theory. Examples include close textual analysis, film and pornography, representing war, film and gender. Prerequisite: Film Studies 101A-B-C or consent of instructor. May be repeated for credit when topic varies.

199 Individual Study (varying credit) F, W, S. Directed reading and research in consultation with a faculty member. Substantial written work required. Prerequisite: consent of sponsoring faculty member.

Department of French and Italian

Faculty

Richard L. Regosin, Ph.D. The Johns Hopkins University, *Chair of the Department and Professor of French* (sixteenth-century French literature)

Daniel Brewer, Ph.D. The Johns Hopkins University, *Assistant Professor of French* (eighteenth- and nineteenth-century French literature)

Ellen S. Burt, Ph.D. Yale University, *Associate Professor of French* (poetry)

David Carroll, Ph.D. The Johns Hopkins University, *Professor of French* (literary theory and twentieth-century French literature)

James Chiampi, Ph.D. Yale University, *Associate Professor of Italian* (Italian Renaissance)

Jacques Derrida, Doctorat d'Etat ès Lettres, *Professor of French and Comparative Literature* (philosophy, critical theory)

Suzanne Gearhart, Ph.D. The Johns Hopkins University, *Associate Professor of French* (seventeenth- and eighteenth-century French literature, philosophy and literature)

Elizabeth Guthrie, Ph.D. University of Illinois, *Lecturer, Director of the French language program*

Judd D. Hubert, Ph.D. Columbia University, *Professor Emeritus of French* (seventeenth- and nineteenth-century French literature)

Renée Riese Hubert, Ph.D. Columbia University, *Professor Emerita of French and Comparative Literature* (literature and fine arts, modern poetry, surrealism, Romanticism, comparative literature)

Alice M. Laborde, Ph.D. University of California, Los Angeles, *Professor of French* (eighteenth-century French literature)

Jean-Francois Lyotard, Doctorat d'Etat ès Lettres, *Professor of French* (philosophy, critical theory)

Leslie W. Rabine, Ph.D. Stanford University, *Associate Professor of French* (nineteenth-century French literature and women's studies)

Aliko Songolo, Ph.D. University of Iowa, *Faculty Assistant for Academic Affirmative Action to the Executive Vice Chancellor and Associate Professor of French* (French African and Caribbean literature)

Bernard Tranel, Ph.D. University of California, San Diego, *Director of the Program in Linguistics and Professor of French and Linguistics* (French linguistics)

The Department of French and Italian offers courses designed to provide linguistic competence and a broad knowledge of aspects of French and Italian culture: literary, social, historical, and aesthetic. It seeks to enrich students' appreciation of their own civilizations and to create a deeper sense of international understanding.

The program brings the students to participate in the creative process of language, to think in French or Italian as they learn to understand, speak, read, and write. Most classes are taught entirely in the foreign language, and a multiple approach stresses the interdependence of the four basic skills and makes them mutually reinforcing. The Language Laboratory is used to complement classroom activity.

All upper-division literature and culture courses are taught in the seminar mode. Because classes are limited in number of students, they promote and encourage participation and discussion and facilitate direct contact with professors.

Representatives chosen by the undergraduate French majors and by the graduate students serve on departmental committees. These representatives also participate in Department meetings and are responsible for student evaluation procedures.

Careers for the French Major

The great majority of students who major in French pursue careers in various sectors of the world of business and commerce, where they can take advantage not only of their competency in communicating in French but also of what they have learned from the study of French literature and civilization. The study of literature teaches students to think critically and develops analytical skills; it also helps them to express their own ideas clearly and persuasively. In practical terms, these skills will allow them to operate efficiently in marketing, publicity, public relations, and management, where sophistication has become essential. A number of students also follow careers in education, continue their studies in graduate school, or enter the diplomatic service.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Undergraduate Program in French

While preparing the student for graduate work and for the teaching profession, the French major is essentially a liberal arts program offering a broad, humanistic course of study.

At the intermediate lower-division level, texts of contemporary literary and social interest provide the focus for advanced conversation, reading, and composition.

After the second year, courses in speaking (conversation and phonetics) and writing enable the students to attain a greater degree of proficiency, preparing them for further study in French literature and linguistics and in French civilization and culture.

In the introductory courses in literature, complete texts are studied in their historical context. The student learns to analyze and interpret different types of creative literature and is introduced to various critical concepts and vocabulary. At the more advanced level, literature courses may emphasize a single author, movement, or critical problem within a historical period. The content of these courses changes yearly according to the interests of both faculty and students. Senior seminars are offered periodically to discuss literary problems which cannot be dealt with in depth in the regular offerings.

Courses in civilization and culture explore aspects of French history, intellectual thought, and the arts. Courses are offered with a historical emphasis (for instance, the world of the Renaissance in France; the Age of Louis XIV; colonialism; anti-Semitism) and with a comparative orientation (for instance, poetry and painting; literature and society; women in literature; Paris and the history of art; literature and history).

Courses in linguistics introduce students to aspects of the structure of the French language and to phonetics.

Students are placed in French courses according to their years of previous study. In general, one year of high school French is equated with one quarter of UCI work. Thus, students with one, two, three, and four years of high school French will enroll in French 1B, 1C, 2A, and 2B, respectively. Exceptions to this placement formula must be approved by

the appropriate course director. Students with transfer credit for college-level French may *not* repeat those courses for credit.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the Major

French Major with Emphasis in Literature and Culture:

French 11, 100A-B, 101A-B-C, and eight other upper-division courses taught in French, at least six of which must be in literature, culture, or civilization.

French Major with Emphasis in Linguistics: French 11, 100A-B, 101A-B-C, two courses in French civilization, Linguistics 50, 110, 120, 130, and French 113, 131. Prospective elementary and secondary school teachers who choose this option should take as electives additional courses in French language, civilization, and/or literature. Work in French civilization is required by State credentialing authorities.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

French 100A-B plus five other French courses, four of which must be upper-division. Prerequisite: French 2C or equivalent.

Residence Requirement for the Minor: Four upper-division courses must be successfully completed at UCI.

Planning a Program of Study

The student and the faculty advisor (assigned upon entering the major) should plan a coherent program of courses to fulfill the literature and culture or the linguistics emphasis.

The Department encourages the student to study in France, either through the University's Education Abroad Program or independently. Information is available in the Department Office.

Students should consult with the departmental coordinator or advisors concerning career plans in the areas of teaching, industry, journalism, law, civil service, etc.

Undergraduate Program in Italian

The Department offers a minor in Italian. In addition to first- and second-year language courses, upper-division offerings provide an introduction to Italian literature and culture that serves as a basis for composition, conversation, and phonetics.

Tutorial and seminar courses are available for advanced students. Students are encouraged to pursue their interests through a major in Humanities, leading to a B.A. degree in Humanities, which combines Italian literature, culture, history, art, and music.

Departmental Requirements for the Minor

Italian 100A-B, 101A-B-C, 130, and one other course outside the Department on Italian history, film, art, or other aspect of Italian culture, chosen in consultation with Department of French and Italian faculty.

Residence Requirement for the Minor: Four upper-division courses must be successfully completed at UCI.

Graduate Program in French

The Department's program of graduate study reflects its concern with the nature of both literature and the critical discourses used to interpret it. Seminars focusing on relationships between literature and theory explore various critical approaches and engage related fields of inquiry such as history, philosophy, aesthetics, psychoanalysis, women's studies, and anthropology.

Master of Arts in French

The Master of Arts degree is considered to be a step toward the Ph.D. degree; only students intending to pursue studies for the doctorate are admitted to the program. Performance on the Master's examination, usually given in the second year of graduate study, determines entrance into the doctoral program. Most candidates take a minimum of 11 graduate courses. Particularly well-prepared students may receive special permission to take a minimum of nine courses and to write a short thesis, for which two course credits are given. All entering graduate students are counseled by the graduate advisor. During the spring quarter of each year, the teaching performance and academic record of each student who is a Teaching Assistant are evaluated. All graduate students are also given a written evaluation of their work on a course-by-course basis. Proficiency in a foreign language in addition to French is required for the M.A. degree (proficiency is defined as the equivalent of the level attained at the end of course 2C).

All M.A. candidates are required to pass a written and oral comprehensive examination on material drawn from the class program and the Master's reading list. The student writes essays demonstrating skills of literary analysis and an understanding of theoretical concepts and their application to the study of specific literary texts. The oral part of the examination allows elaboration on aspects of the written examination, but seeks as well to test the students' broader knowledge.

The Master's examination is normally given at the end of winter quarter. Students who are Teaching Assistants normally take the examination in the fifth quarter of their studies.

Doctor of Philosophy in French

Upon successful completion of the Master's examination and admission to the Ph.D. program, or upon admission with a Master's degree from an accredited institution, a Guidance Committee is appointed in consultation with the student. The Guidance Committee advises the student in the choice of courses to help prepare for the written and oral Qualifying Examinations leading to advancement to candidacy for the Ph.D. degree. The Committee is composed of three faculty members from the Department, one faculty member from outside the Department, who represents the student's outside area of specialization, and, for the defense, one faculty member who is not affiliated with the School. One member of the Committee is expected to direct the dissertation.

Language Requirements: A reading knowledge of two foreign languages relevant to the student's area of specialization and subject to the approval of the Guidance Committee.

Course Requirements: A minimum of 18 graduate courses or seminars in French beyond the B.A. and three graduate courses outside the Department in areas related to the field of specialization are required.

A student may pursue the Ph.D. with particular emphasis in literary theory by taking additional course work in the

Department and in the Critical Theory Program beyond the minimum number required.

Teaching: Since the overwhelming majority of Ph.D. candidates plan to teach, the Department recognizes its responsibility to train them as teachers. Therefore, as far as it is possible, all candidates without previous teaching experience are required to participate in a program of supervised teaching for at least one year.

Qualifying Examination—Written and Oral: Upon completion of course work, the student takes a series of examinations involving problems of a critical and interpretive nature. The Ph.D. Examination encourages focus and depth at a time when the student's area of specialization and eventual dissertation topic should be taking an increasingly clearer shape. Accordingly, the examination is divided into five topic areas: author, genre, period, criticism, and an outside area. In consultation with the Guidance Committee, the student defines the precise nature and scope of the topics for the examination, which consists of written and oral parts. Upon successful completion of the written and oral Qualifying Examinations, the student is advanced to candidacy for the Ph.D. degree.

Dissertation: The dissertation topic chosen by the candidate will normally, but not necessarily, fall within one of the major fields covered by the Qualifying Examination. The dissertation must be defended in an oral examination and approved by the Doctoral Committee before the candidate is recommended for the degree.

Three faculty members, chosen by the candidate, proposed by the Department, and appointed by the Graduate Council, constitute the Doctoral Committee which directs the preparation and completion of the doctoral dissertation. The Doctoral Committee supervises an oral defense, the focus of which is the content of the doctoral dissertation, and certifies that a completed dissertation is satisfactory.

Lower-Division Courses in French

1A-B-C Fundamentals of French (5-5-5) 1A (F, S), 1B (F, W), 1C (W, S). Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French and meet daily. Language Laboratory attendance is required.

S1A-B Fundamentals of French (7.5-7.5) Summer. First-year French in an intensified form.

R1 French for Reading (4). Serves those students not planning to major in French who want to develop their reading ability in French rapidly; recommended for graduate students in any field who need a reading knowledge of another language.

2A-B-C Intermediate French (4-4-4) 2A (F, S), 2B (F, W), 2C (W, S). Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading and composition. Classes are conducted entirely in French. Prerequisite: normally three years of high school French or one year of college French. (V)

11 French Phonetics (4) W. Designed to help students improve their pronunciation; serves also as a preparatory course for language teaching, since it provides a basic understanding of the French sound system. Prerequisite: French 2C or equivalent.

13 Conversation (4) F, W, S. Helps students increase their fluency and enrich their vocabulary. Prerequisite: French 2C or equivalent.

30 Literature and Society (4). In English. An interdisciplinary introduction to literature within the context of social and political history, focusing on French literature and society. Variable topics. Same as Humanities 30A. (IV)

50A-B-C French Connections (4-4-4). In English. Introduces students to essential aspects of French culture from the Renaissance to modern times, from the perspective of France's interaction with

other cultures. With special emphasis given to the study of the relations of France with England, America, and the Third World, the literature, art, and philosophy of France are studied in order to understand the role of France in the formation of the modern world. (IV)

Upper-Division Courses in French

100 Composition and Grammar Review

100A Advanced Grammar and Composition (4) F, W. Systematic review of grammar with written compositions on various topics. Students study and practice forms of descriptive and imitative writing, techniques of translation, and textual analysis including *explication de texte* of prose and poetry passages. Prerequisite: French 2C or equivalent.

100B Essay Writing (4) W, S. Trains students to write about literature in French, and introduces them to specific critical approaches and strategies for utilizing library resources, organizing arguments, and developing a coherent essay. Topics for weekly compositions drawn from texts of literary, historical, and social interest. Prerequisite: French 100A or equivalent.

101A-B-C Introduction to French Literature (4-4-4) F, W, S. Introduction to all of the genres of a narrowly defined period in relation to a specific literary problem. In French. French 100A and 100B are recommended as prerequisites but may be taken concurrently with French 101A-B-C.

105 Advanced Composition and Style (4). Helps the student attain greater proficiency and elegance in the written language. Prerequisites: French 100A-B.

NOTE: The prerequisite for the following upper-division courses, except French 113 and 131, is French 101A-B-C or the equivalent. The content of these upper-division courses changes yearly. Students should consult the offerings in linguistics under the Program in Linguistics. NOTE: Courses numbered 110A-B-C through 198, except 139, may be repeated for credit when topics change.

110A-B-C French Civilization (4-4-4)

112A-B-C French Culture (4-4-4)

113 Topics in French Linguistics (4) S. Prerequisites: French 11 or Linguistics 50, and French 100A-B. Recommended: Linguistics 110 and 120.

115A-B-C Medieval Literature and Culture (4-4-4)

116A-B-C Sixteenth-Century French Literature (4-4-4)

117A-B-C Seventeenth-Century French Literature (4-4-4)

118A-B-C Eighteenth-Century French Literature (4-4-4)

119A-B-C Nineteenth-Century French Literature (4-4-4)

120A-B-C Twentieth-Century French Literature (4-4-4)

125A-B-C African Literature of French Expression (4-4-4) F, W, S. Introduction to the principal African and Caribbean works written in French. Offers opportunity to study literature and culture in French in a non-European context. Lectures and papers in French.

130 Junior-Senior Seminar in French Literature (4). Work on a specific topic of French literature or criticism. May be repeated. Prerequisite: two upper-division literature courses beyond French 101.

131 Junior-Senior Seminar in French Linguistics (4). Prerequisites: French 11 or Linguistics 50, and French 100A-B. Recommended: Linguistics 110 and 120.

139 Literature and Society (4). In English. Readings of masterpieces of French literature in their social, political, and historical contexts. Course requires at least 4,000 words of assigned composition based on French works. Several essays required. Topics vary. French majors have admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

140A-B-C Readings in French Literary Genre (4-4-4)

150A-B-C Topics in French Literature and Culture (4-4-4). In English. May not be counted toward the major.

160 French Cinema (4) F, W, S, Summer. In English. May have discussion sections in French. May be repeated when topic varies, but

can be taken only twice for credit toward the major. Same as Film Studies 160.

198 Special Studies in French Linguistics (4-4-4) F, W, S. To be taken only when the materials to be studied and the topic to be pursued lie outside the departmental offerings, when the student will have no formal chance in the course of several years to pursue the subject of interest, and when the subject fits significantly into the student's major program. Prerequisites: consent of instructor and of Department Chair; student must submit a written description of the course to the Chair prior to the first week of classes to obtain consent. May be repeated for credit.

199 Special Studies in French (4) F, W, S. Open only to outstanding students. Research paper required. Prerequisites: consent of instructor and of Department Chair; student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of classes.

Graduate Courses in French

The content of these courses changes yearly. Students should also consult the offerings of the Program in Linguistics.

In addition to the following courses, graduate students in French might find these Humanities courses of special interest: Humanities 200 (The Nature and Theory of History); Humanities 210 (Approaches to Linguistic Study); Humanities 220A-B-C (Literary Theory); Humanities 230 (Philosophical Analysis); and Humanities 270A-B-C (Advanced Topics in Critical Theory).

200 Selected Topics in French Linguistics (4). May be repeated.

201 History of the French Language (4)

202 Contrastive French Phonology (4)

203 Contrastive French Morphology and Syntax (4)

208 Stylistics (4)

NOTE: Courses numbered 210A-B-C through 399, except 280 may be repeated for credit.

210A-B-C Studies in Medieval Literature (4-4-4)

216A-B-C Studies in Renaissance Literature (4-4-4)

217A-B-C Studies in Baroque and Classical Literature (4-4-4)

218A-B-C Studies in Eighteenth-Century Literature (4-4-4)

219A-B-C Studies in Romanticism and Symbolism (4-4-4)

219D-E Studies in Naturalism and Realism (4-4)

220A-B-C Contemporary Novel (4-4-4)

221A-B-C Contemporary Poetry (4-4-4)

222A-B Contemporary Theatre (4-4)

230 Studies in Dramatic Literature (4)

231 Studies in Fiction (4)

232 Studies in Nonfictional Prose (4)

233 Studies in Poetry and Poetics (4)

240 Studies on a Major Writer (4)

251A-B-C Theory of Literature I (Comparative Methods) (4-4-4)

252A-B-C Theory of Literature II (Study of Genre) (4-4-4)

260A-B Literary Criticism (4-4)

270 Writing and Style (4)

280 Directed Study in French Literature (4) F, W. Restricted to graduate students taking the Master's examination the same quarter.

290 Research in French Language and Literature (4-4-4) F, W, S. A project proposal must be prepared by the student and approved by the faculty member who will direct the project. This proposal, with the faculty member's signature, must be given to the Chair for approval and will be put in the student's file. This procedure can be completed before or after registration or at the very latest must be completed by the end of the first week of classes. After the end of the first week no 290s can be approved. M.A. candidates may take this course once; Ph.D. candidates may take it twice.

291 Research in French Linguistics (4-4-4) F, W, S. A project proposal must be prepared by the student and approved by the faculty member who will direct the project. This proposal, with the faculty member's signature, must be given to the Chair for approval and will be put in the student's file. This procedure can be completed before or after registration or at the very latest must be completed by the end of the first week of classes. After the end of the first week no 291s can be approved. M.A. candidates may take French 291 or French 290 only once; Ph.D. candidates may take French 291 or French 290 twice.

299 Dissertation Research (4 to 12) F, W, S

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Lower-Division Courses in Italian

1A-B-C Fundamentals of Italian (5-5-5) F, W, S. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily. Language Laboratory attendance is required.

R1A Italian for Reading (5). Intended for students who wish to acquire a reading knowledge of Italian in the briefest time possible. Recommended for graduate students of any discipline who require a reading knowledge of a foreign language. Open to nonmajors.

2A-B-C Intermediate Italian (4-4-4) F, W, S. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian. Prerequisite: normally three years of high school Italian or one year of college Italian. (V)

99 Special Studies in Italian (4) F, W, S. Both student and instructor arrive at the theme of the course and the critical approach to be followed in consultation. Intended to offer courses in Italian otherwise unavailable. Prerequisites: consent of instructor and Department Chair; student must submit a written description of the course to the Chair prior to the first week of classes to obtain consent. May be repeated for credit when topic changes.

Upper-Division Courses in Italian

100A-B Italian Language and Civilization (4-4). Systematic review of grammar with written and oral composition on topics chosen from readings on Italian culture and civilization. Prerequisite: completion of Italian 2C or equivalent.

101 Introduction to Italian Literature. In this series of courses students learn to analyze and interpret creative literature by genre and are introduced to various critical techniques.

101A Introduction to Poetry (4)

101B Introduction to Theatre (4)

101C Introduction to Novel (4)

130 Major Italian Literary Figures (4). Examines a major Italian literary figure selected from a period of Italian literature. May be repeated when topic varies. Prerequisite: Italian 101A-B-C.

140A-B-C Readings in Medieval and Renaissance Literature (4-4-4). In English.

150 Topics in Modern Italian Culture (4). In English; no prerequisites. May be repeated for credit when topic changes.

160 Italian Cinema (4-4). In English. May be repeated but may be taken only twice for credit. Same as Film Studies 160.

199 Tutorial in Italian Literature and Culture (4-4-4) F, W, S. The student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of the course. Prerequisites: consent of instructor and approval of the Department Chair.

Department of German

Faculty

Thomas P. Saine, Ph.D. Yale University, *Acting Chair of the Department and Professor of German* (eighteenth-century German literature, Goethe)

Ruth K. Angress, Ph.D. University of California, Berkeley, *Professor of German* (Kleist, nineteenth-century literature, Stifter, Holocaust literature)

Meredith Lee, Ph.D. Yale University, *Associate Professor of German* (lyric poetry, Goethe and eighteenth-century literature, German-Scandinavian literary relations)

Herbert Lehnert, Ph.D. University of Kiel, *Professor of German* (modern German literature)

William J. Lillyman, Ph.D. Stanford University, *Professor of German* (Romanticism, Goethe, Tieck)

Bert Nagel, Ph.D. University of Heidelberg, *Professor Emeritus of German* (medieval German literature)

Eric Rentschler, Ph.D. University of Washington, *Director of the Program in Film Studies and Professor of German* (German film, modern German literature, German comedy)

Helmut J. Schneider, Ph.D. University of Bonn, *Associate Professor of German* (pastoral poetry, Enlightenment, Jean Paul, contemporary German literature)

John H. Smith, Ph.D. Princeton University, *Assistant Professor of German* (eighteenth- and nineteenth-century literature and intellectual history, literary theory)

Gabriele Steiner, M.A. University of California, Irvine, *Lecturer in German* (teaching methodology)

The Department of German sees its contribution in the context of the humanistic endeavor to understand and evaluate Western culture. We can understand ourselves and our immediate culture more clearly through the study of related but different languages and cultures. The Department offers courses on the German language and on German literature and film. The study of German literature is pursued from various critical perspectives. Some courses emphasize its historical, social, and political significance and setting; in others literature is approached as an imaginative experience which transcends its immediate context. The history of German literature and film, the theory of literature and literary criticism, and the relations of German literature to other literatures are also studied in the Department's courses.

Undergraduate Program

The German major offers alternative emphases, one in literature and another in linguistics.

All courses in the Department are taught in German to the extent compatible with the aim of the course. In the basic courses the student will develop an understanding of the nature of the language, based on linguistic principles, while learning the necessary skills. Use is made of the Language Laboratory. At the end of the first year, students will have attained mastery of the basic structure of the language.

At the intermediate and advanced levels the student's ability to read and write German will be developed gradually. A three-quarter, third-year course stresses composition and provides an introduction to contemporary German culture. It can be followed by a course in phonetics which aims to perfect the pronunciation as well as to introduce historical and dialectal variants. The introductory course in literature, usually taken in the third year, presents a first view of some periods of German literary history, familiarizes the student with German terminology used in the interpretation of literature, and uses these concepts in practical interpretations. A certain number of courses in the series German 117, 118, 119, 120 will be designated as "core courses" which cover German literature from the Reformation to the present and are especially recommended for majors. It is assumed that the student is familiar with basic concepts of literature in English. A further series of courses (German 130, 140, 160) treats questions of theme and genre and topics in literary theory and criticism, as well as perspectives in German cinema.

Students are given the opportunity to participate in programs of work and study abroad during the summer and the junior year. The University's Education Abroad Program has study

centers in Göttingen and Vienna, among other locations. Certain courses taken while participating in the Education Abroad Program are recommended as contributing to fulfillment of the German major requirements.

Students are placed in German courses according to their years of previous study. In general, one year of high school work is equated with one quarter of UCI work. Thus students with one, two, three, and four years of high school German will normally enroll in German 1B, 1C, 2A, and 2B respectively. Exceptions to this placement procedure must have the approval of the director of first- or second-year German instruction. Students with transfer credit for college-level German may *not* repeat those courses.

Careers for the German Major

German is excellent preparation for professional schools. It can be combined successfully with work in the natural sciences, business and management, and the computer sciences, and it is invaluable for advanced work in the humanities and the fine arts. The ability to speak and write German, when combined with other skills and specific training, can open up opportunities in communications, foreign trade and banking, transportation, government, science and technology, tourism, library services, and teaching.

Recent graduates of the German Department have begun careers in international law, business, the foreign service, the airline industry, professional translating, journalism, and all levels of education, including university teaching.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the Major

German Major with Literature Emphasis: German 100A-B-C; German 101; eight upper-division literature courses; and two courses selected from German 140, 150, 160, Linguistics 50, German 30, English and Comparative Literature CL 50A-B-C, a course in German history, or a course in German philosophy, as approved by the advisor for the major. German 139 may not be used to satisfy major requirements.

Students who plan to acquire a teaching credential, or intend to do graduate work in literature, are encouraged to take the major with literature emphasis.

German Major with Linguistic Emphasis: German 100A-B-C; German 101; five upper-division literature courses; Linguistics 50, 110, 120; one course selected from Linguistics 130, a Middle High German course, or a course in the history of the German Language; one course selected from German 140, 150, 160. German 139 may not be used to satisfy major requirements.

The German major with linguistic emphasis is recommended especially for students who intend to do graduate work in linguistics or enter a linguistics-related profession.

Residence Requirements for the Major: At least five of the upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

Seven upper-division courses, which must include German 100A-B-C and German 101. Not more than one course from

German 140, 150, or 160 may be counted for the minor.

German 139 may not be used to satisfy minor requirements.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI.

Graduate Program

In its graduate courses the Department stresses theoretical understanding of the nature of literature in its specific application to literature written in the German language. The Department also offers regular courses devoted to the history, analysis, and theory of German film, viewing the medium in its relationship to other forms of expression as well as considering it as an art form in its own right.

Courses also are offered elucidating the structure and history of the German language.

The graduate program in German is essentially a program leading to the Ph.D. The M.A. requires a minimum of one year in academic residence and must be completed in no more than two years of full-time graduate study. The Department will decide after completion of the M.A., at the latest, whether or not to permit the student to continue in the Ph.D. program. The M.A. thus may be in some cases a terminal degree. In those cases where the student enters the UCI graduate program in German with an M.A. from another institution, the Department will evaluate the student's progress during the first year of study before deciding to allow continuation toward the Ph.D.

Students who enter with normal academic preparation and pursue a full-time program of study ordinarily should be able to earn the Ph.D. degree within six years or less.

Master of Arts in German

Before entering the program, a candidate is expected to have the equivalent of our undergraduate major. Students with a bachelor's degree in another subject may be considered for admission. Normally their course of studies will have to be extended in order to make up for the deficiency. However, each case is considered individually by the faculty. The minimum course requirement for the M.A. degree is nine courses, eight of which must be taken within the Department of German. Reading knowledge of a foreign language other than German also is required for the M.A. degree. Whenever possible, a candidate is urged to complete this requirement before entering the program. Further requirements follow.

The Preparation of a Reading List. All candidates should prepare as early as possible a list of works read in the field of German literature, both primary texts and critical works. This list should preferably be augmented by critical texts and by works from other literatures which, in the candidate's opinion, relate to the German works in the list. Since it should ultimately contain representative selections from various eras of German literature and some works of criticism, a tentative list must be discussed with the graduate advisor before the end of the fall quarter of the year in which the candidate expects to receive the M.A. Candidates should indicate on the list a number of works with which they are especially familiar. In its final form (including works read during the course of study both in and out of class) the list will be submitted together with the essay two weeks before the oral examination. It is the student's responsibility to keep the reading list current.

The Master's Essay. The purpose of the written part of the M.A. comprehensive examination is to show the candidate's methodological progress in interpreting German literature. It consists of an essay in which a text is elucidated and related to: (a) pertinent works by the same author, (b) its social and historical context, and (c) other works of German or other literatures with which the candidate is familiar. The level of the discussion will normally be enhanced by the candidate's knowledge of the relevant secondary literature. The topic of the essay should be tentatively formulated and reported to the graduate advisor before the end of the second quarter of the student's residence.

The Oral Examination. During the oral examination the following items will be discussed: (a) the essay, (b) the reading list. The discussion based on the reading list will focus on works which the student knows well, but may broaden into other areas.

One Course in University Teaching (399)

One Year of Residence

Ph.D. in German

The Department requires a minimum of 22 approved courses from students entering with a bachelor's degree. These may include courses in philosophy, history, comparative literature, etc., suitable for the individual student's program of study. The course Introduction to Middle High German and one course in medieval German literature are required. The student also will participate in each of the German Department's colloquia. The student will augment the reading list and keep it current during the whole course of study. At least two years of residence are required.

Students entering with the master's degree will be advised individually as to remaining course requirements.

Since the majority of Ph.D. candidates choose careers as teachers, the German Department recognizes its obligation to offer them preparatory experience. Therefore, all candidates for the Ph.D. are required to teach under the supervision of a faculty member at least one course in each of three quarters (for which they will receive credit as German 399). Three of these courses may be counted toward the 22 courses required for the Ph.D.

Comprehensive Examination. There are two parts to the examination. In order to fulfill the written examination requirement the student will choose either (1) to present a lecture to the faculty and to the other graduate students, or (2) to write a three-part examination (one part on a significant author, one on a major genre, and one on an historical period) within a period of two weeks. These examination essays may be either closed-book or take-home, by agreement with the candidate's examination committee. The examination essays or the lecture will be on a text or texts selected by the faculty from a reading list submitted by the student for the comprehensive examination. The second part of the comprehensive examination is the formal oral qualifying examination of up to three hours duration ranging over the whole field of the student's studies, to be taken within two weeks after completion of the written examination. The student will submit the reading list at least two weeks before the written examination after consultation with the members of the examination committee.

Language Requirements. The candidate must demonstrate reading competence in two languages or extensive competence in one language other than German or English. Choice of language(s) depends on the student's area of specialization. French and Latin are recommended. For the various ways in

which these requirements may be fulfilled, the student should see the graduate advisor.

Dissertation. Toward the end of the second year of study, the student should formulate a tentative dissertation topic. Three faculty members proposed by the Department and appointed by the Graduate Council constitute the Doctoral Committee which directs the preparation and completion of the dissertation. The Doctoral Committee certifies that a completed dissertation is satisfactory through the signature of the Committee members on the title page of the dissertation.

Lower-Division Courses

NOTE: A student may take any one of the three first-year courses: German 1A-B-C; R1A-B-C; S1A-B.

1A-B-C Fundamentals of German (5-5-5) F, W, S. Basic language skills of understanding, speaking, reading, and writing. Classes conducted in German. Language Laboratory attendance is required.

R1A-B-C Fundamentals of German (with emphasis on reading) (4-4-4) F, W, S. For students not planning to major in German who want to develop reading ability rapidly. Does not serve as prerequisite for any higher-level course in German.

S1A-B Fundamentals of German (7.5-7.5) Summer. First-year German in intensive form.

2A-B-C Intermediate German (4-4-4) F, W, S. Conversation, reading, and composition skills; texts of literary and social interest. Intensive review of grammar. Conducted in German. Prerequisite: German 1C. (V)

30 Literature and Society (4). An interdisciplinary introduction to literature within the context of social and political history, focusing on German literature and society. In English translation. Variable topics. Same as Humanities 30B. (IV) Not offered 1989-90.

53 Advanced Conversation (2) S. Includes reading of political and cultural material. Prerequisite: German 2C.

Upper-Division Courses

NOTE: Upper-division courses normally are taught in German. Exceptions are German 103, 139, 140, 150A-B-C, and 160.

100A-B-C Advanced Composition (4-4-4) F, W, S. Competence in writing and reading expository German.

101 Introduction to Literature (4) F. Sample interpretations of poetry and prose. Introduction to critical language in German. Prerequisite: German 2C.

102A Literature and Society Since World War II (4). Interdisciplinary introduction to recent German literature not only as an aesthetic phenomenon but also as a social and political force. Methodological problems arising from an analysis of literature in its historical context. Prerequisite: German 2C or consent of instructor.

102B Literature and Society 1918-1945 (4). See above description. Prerequisite: German 2C or consent of instructor.

103 German Phonetics (4) S. Contrastive analyses of the sound of English and German. Emphasis on standard German pronunciation. Prerequisite: German 2C. Not offered 1989-90.

NOTE: Courses numbered 117 to 199 (with the exception of German 139) may be repeated provided course content changes. German 101 or consent of instructor is prerequisite for courses 117 to 120.

117 Topics in German Literature 750-1750 (4). Specific course content determined by individual faculty members. Example: Luther and the European Renaissance.

118 Studies in the Age of Goethe (4). Individual authors such as Lessing, Goethe, Schiller, Kleist, and Hölderlin, or the drama of the "angry young men" of the German 1770s.

119 Studies in Nineteenth-Century German Literature (4). Individual authors such as Büchner, Grillparzer, Keller, and Nietzsche, or broader social-literary phenomena.

120 Studies in Twentieth-Century German Literature (4). Individual authors such as Thomas Mann, Brecht, Kafka, Rilke, and Grass, or topics addressing questions of genre such as the drama of German Expressionism.

130 Topics in German Literature (4). Literary topics not fully contained within the periods listed above, such as "German Comedy," "The Novel from Wieland to Fontane."

139 Writing about Literature (4) S. In English. Requires at least 4,000 words of assigned composition based upon readings in German literatures. Several essays required. Topics vary. German majors given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor. Not offered 1989-90.

140 Topics in Literary Theory and Criticism (4-4-4). In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics such as Marxism, Freudian thought, the German Idealistic tradition of aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and *Rezeptionsaesthetik* are explored in a selection of theoretical, critical, and literary texts.

150A-B-C German Literature in Translation (4-4-4) F, W, S. Major German literary works in translation.

160 German Cinema (4). Historical, theoretical, and comparative perspectives on German cinema. Same as Film Studies 160.

199 Individual Study (4) F, W, S. May be repeated for credit.

Graduate Courses

All graduate courses offered in the Department fall under the generic titles German 200, 210, 220, and 230. Course titles and contents change according to the instructor teaching them; courses offered under these numbers may be repeated for credit provided the content has changed. Complete course descriptions are available quarterly from the Department and School of Humanities.

Three core courses dealing with the lyric, drama, and novel traditions are offered, normally one each year. These courses combine theoretical with historical considerations and practical interpretations. Other graduate courses aim at letting the student share in the research interests of the faculty at the frontiers of on-going scholarship. Such courses may be devoted to topics, methods of interpretation and research, or individual authors.

200 Literary Criticism (4)

210 Literary Theory (4)

220 Selected Topics in German Linguistics (4)

230 Literary and Cultural History (4)

290 Independent Study (4). Counted toward course requirements for the M.A. or Ph.D. A term paper or project is required. Letter grade only. May be repeated for credit.

298 Directed Reading (4). For students preparing for doctoral examination. Satisfactory/Unsatisfactory only.

299 Dissertation Research (4). For students who have been admitted to doctoral candidacy. Satisfactory/Unsatisfactory only.

398A-B The Teaching of German (2-2) F, W. Required of all Teaching Assistants in the German Department. Also open to present and prospective teachers of German who are not Teaching Assistants.

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Department of History

Faculty

Michael P. Johnson, Ph.D. Stanford University, *Chair of the Department and Professor of History* (American social and political)

Gordon H. Chang, Ph.D. Stanford University, *Assistant Professor of History* (U.S./International)

Cornelia H. Dayton, Ph.D. Princeton University, *Assistant Professor of History* (early American, legal and social, women's)

Jonathan S. Dewald, Ph.D. University of California, Berkeley, *Professor of History* (early modern European social)

John P. Diggins, Ph.D. University of Southern California, *Professor of History* (American intellectual)

Richard I. Frank, Ph.D. University of California, Berkeley, *Associate Professor of History and Classics* (Roman empire, Classics)

James B. Given, Ph.D. Stanford University, *Associate Professor of History* (Medieval Europe)

Lamar Mott Hill, Ph.D. University of London, *Associate Professor of History* (Britain in the Tudor-Stuart era)

Karl G. Hufbauer, Ph.D. University of California, Berkeley, *Associate Professor of History* (social history of science)

Jon S. Jacobson, Ph.D. University of California, Berkeley, *Associate Professor of History* (European international)

Thomas E. Keirstead, Ph.D. Stanford University, *Acting Assistant Professor of History* (Japanese medieval)

Lynn Mally, Ph.D. University of California, Berkeley, *Assistant Professor of History* (modern Russian and Soviet)

Samuel C. McCulloch, Ph.D. University of California, Los Angeles, *Professor Emeritus of History* (British empire and commonwealth, nineteenth-century)

Henry Cord Meyer, Ph.D. Yale University, *Professor Emeritus of History* (twentieth-century Europe)

Robert G. Moeller, Ph.D. University of California, Berkeley, *Associate Professor of History* (modern Germany, European women)

Keith L. Nelson, Ph.D. University of California, Berkeley, *Associate Professor of History* (American foreign relations)

Patricia A. O'Brien, Ph.D. Columbia University, *Associate Professor of History* (modern French social)

Spencer C. Olin, Jr., Ph.D. Claremont Graduate School, *Professor of History* (American social and political)

Kenneth L. Pomeranz, Ph.D. Yale University, *Assistant Professor of History* (Modern China)

Mark S. Poster, Ph.D. New York University, *Professor of History* (modern European intellectual)

David C. Rankin, Ph.D. The Johns Hopkins University, *Associate Adjunct Professor of History* (American social, Black history)

Jaime E. Rodríguez, Ph.D. University of Texas, *Professor of History* (Latin America, Mexico)

Amy Dru Stanley, Ph.D. Yale University, *Assistant Professor of History* (American women's)

Timothy Tackett, Ph.D. Stanford University, *Professor of History* (Old Regime Europe, French Revolution)

Steven C. Topik, Ph.D. University of Texas, *Associate Professor of History* (Latin America)

Gerald T. White, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (American economic and business)

Jonathan M. Wiener, Ph.D. Harvard University, *Professor of History* (history and social theory)

R. Bin Wong, Ph.D. Harvard University, *Associate Professor of History* (modern Chinese, comparative economic)

Undergraduate Program

The undergraduate program in History is designed to develop critical intelligence and to foster an awareness of ourselves and our world through the study of the past. The Department offers a variety of approaches to history, and each emphasizes basic disciplinary skills: weighing evidence, expository writing, constructing logical arguments, and exploring the role of theory in historical analysis and human action.

In addition to offering a number of lower-division history courses open to nonmajors, the Department requires all History majors to participate in an introductory core course, History 29A-B-C. This is a comparative course that acquaints students with the modern world by examining some of the basic characteristics of modernity and by focusing on the historic process of modernization in different societies over time.

The Department has established a minor in History, designed for students who are interested in the study of history but

who are majoring in other disciplines. The program incorporates the main elements of the Department's program for majors but allows students enough flexibility to pursue programs in other departments and schools.

From this introductory course the student moves on to a series of upper-division courses, the contents of which range from the examination of individual nation-states (e.g., British History), to studies of the relations among nation-states (e.g., European International History), to historical analyses of political, socio-economic, and cultural factors (e.g., Women and the Family in the United States). Students are also provided the opportunity for small-group learning experiences in a series of colloquia in the following areas: social history, political history, international history, intellectual history, social thought, and comparative history. The colloquia are conducted as discussion groups and involve close reading and analysis of secondary texts. The senior seminar is a two-quarter research seminar in primary materials that culminates in the writing of a research paper.

Faculty members in the Department of History work closely with their students. All upper-division History majors are assigned a faculty advisor, whom they are encouraged to consult at least once each quarter.

Careers for the History Major

The training and discipline derived from historical studies provide a valuable experience for all educated persons seeking to understand themselves and their world. Many students who complete undergraduate degrees in the Department of History go on to graduate school in a variety of fields, including history, law, business, international relations, and teacher education. The study of history is valuable preparation for many other careers as well. The strong academic and professional orientation acquired by History majors is necessary to pursue successful careers in such diverse fields as advertising, banking, journalism, management, public relations, publishing, and government service.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the Major

Fourteen courses are required, including History 29A-B-C (for which transfer students may substitute such year-long surveys as European, American, Asian, or Latin American history); at least five upper-division historical studies courses; at least one colloquium and one senior seminar (a two-course sequence) *or* three colloquia; and three additional courses (which may be drawn from lower- and upper-division offerings).

Residence Requirement for the Major: Three historical studies and a senior seminar (or two colloquia) must be completed successfully at UCI.

Departmental Requirements for the Minor

Seven courses are required, including either at least one quarter of History 29 or at least one quarter of History 50. (Minors are encouraged to take the full History 29 sequence.) At least four of the remaining six courses must be upper-division History courses and must include two colloquia or one senior seminar.

Residence Requirement for the Minor: At least four upper-division History courses must be completed successfully at UCI.

Graduate Program

The graduate program leading to the M.A. and Ph.D. degrees in History is designed to provide students with both advanced historical skills and a rigorous grounding in historical theory. This combination of theoretical study with training in historical method reflects the Department's conviction that scholars should be encouraged to deal with significant questions about the past and to approach these questions in a methodologically sophisticated way. This approach requires that the student develop the critical abilities necessary to deal with primary sources, secondary syntheses, and the interrelationship of history and theory. Candidates for an advanced degree in History are expected to gain teaching experience as an integral part of their graduate training. Ordinarily this is accomplished through service as a Teaching Assistant.

Basic to the Department's curriculum is a year-long course in History and Theory which deals with both theoretical texts and historical studies that have utilized theoretical concepts and models. The History and Theory course also examines the phenomenon of modernization—the general world transformation of the past four hundred years—and seeks to understand the social institutions through which this process has occurred. The course directs attention to the diverse implications of modernity, to the groups who dominated and were dominated by it, and to the costs and benefits of the process. These matters can be studied most satisfactorily by the historian whose theoretical self-consciousness and methodological facility have been systematically and carefully developed.

An introductory two-quarter research seminar is required during the first year of study for the Ph.D. and is one of the three courses which comprise the one-year M.A. curriculum. This course offers guidance in the selection of significant research topics, the formulation of coherent statements of historical problems, the carrying out of projects of original research, and the writing of research papers. Students awarded M.A. degrees at other institutions before entering the graduate program at UCI may be exempted from this requirement, subject to evaluation of their M.A. theses.

Another research seminar, of three quarters' duration, is required of all graduate students (including those entering with an M.A. degree).

The colloquium, a reading course that examines the chief historical works in a "time-place" field, enriches the student's knowledge of the main areas of historical research and develops critical reading skills. Colloquia are offered yearly in American history and Modern European history, biannually in Early Modern European history, Latin American history, and Ancient history, and occasionally in medieval history. A student may prepare a dissertation in any of these fields. In addition, independent reading and research courses are provided for advanced, specialized study in tutorial form.

The immediate objective for the doctoral student is to develop four fields of competence in preparation for a comprehensive examination. These fields are: history and theory; first "time-place" field (field in which the dissertation is written); second "time-place" field; "focus" field (such as social, political, intellectual, or international history).

The subsequent objective, to write a distinctive dissertation, is of crucial importance. To assist in accomplishing both objectives, the Department offers intensive consultation with the faculty as well as a lively intellectual atmosphere. Students have long shared in the decision-making processes of the Department, which engages the entire historical community at Irvine in the collective pursuit of excellence. Students profit also from a vigorous visiting speakers program that brings scholars from other campuses and other nations to meet and interact with UCI students and faculty.

Master of Arts in History

Requirements for Admission. Although it is desirable that an applicant have the equivalent of an undergraduate major in History, the Department also accepts students who have previously specialized in other subject areas and who show promise of sustained and self-disciplined work in history. Typically, a minimum undergraduate grade point average of 3.0 (B) is required for admission, with evidence of better work in history. In addition, all applicants are asked to submit three letters of recommendation, scores from the Graduate Record Examination, and examples of written work in history from their undergraduate classes. Students are accepted for admission for fall quarter only, and the deadline for application for fall admission is March 1.

Program of Study. The M.A. program emphasizes the theoretical and historiographical dimensions of history. Each candidate for the M.A. will choose a graduate advisor who will supervise the student's program. Nine courses are required for the degree: three in History and Theory (History 200A-B-C), three in "time-place" colloquia, and two in the First-Year Research Seminar, and one quarter of an elective such as Directed Reading. Students intending to pursue the Ph.D. should begin at once to delineate doctoral interests in order to fit their work for the M.A. into the total program.

Language Requirement. Normally a reading knowledge of one foreign language is required for the M.A. degree. Students in American history, with an advisor's permission, may substitute a one-quarter departmental course in quantitative methods for the M.A. foreign language requirement. Language proficiency is usually demonstrated by passing a departmental exam administered by a faculty member proficient in the chosen language; students can also fulfill the requirement by achieving a score of 500 or more on the appropriate ETS examination.

Comprehensive Examination. At the end of the final quarter the M.A. candidate must pass a comprehensive oral examination covering the student's major field (e.g., America, Early Modern Europe) and focusing upon material assigned in the three-quarter "time-place" colloquium series.

Time Limits. The M.A. requires a minimum of one year in academic residence and must be completed in no more than two years of graduate study.

Doctor of Philosophy in History

Requirements for Admission. Applicants submit transcripts, three letters of recommendation, example(s) of written work, and aptitude scores from the Graduate Record Examination. In addition, a departmental interview may be required.

Ph.D. students are advised to begin their graduate work at UCI, since those who have taken the M.A. elsewhere will be expected to enroll in the same courses that are required of all incoming students, with the exception of the First Year Research Seminar. Subject to evaluation of their M.A. theses, students will be exempted from this requirement. In the

second and third years, the greater experience of those who enter with an M.A. may work to advantage in speeding them to examinations.

To be admitted formally into the doctoral program, students must satisfactorily pass a departmental evaluation at the end of their first year of study; this includes students who entered with an M.A. from another institution.

Incoming students are admitted for fall quarter only, and the deadline for application for fall admission is March 1.

Program of Study. The Department requires doctoral students to prepare themselves in four different areas:

1. History and Theory.
2. The first "time-place" field (such as Modern Europe), which is designed as a teaching field as well as the focus of the student's dissertation.
3. The second "time-place" field (such as American History), which is designed as a second teaching field.
4. A "focus" field (such as social history), which is designed to enhance the student's capability for dealing with the problems and phenomena of the field, to make comparisons, and to introduce the student to the theory and method of relevant related disciplines (e.g., sociology).

The courses required in this preparation include the History and Theory sequence, colloquia series in both time-place fields, and the two Research Seminar sequences. The normal academic load is three courses per quarter. However, applicants may be eligible for approved part-time status, which allows students to take a lighter course load at reduced fees.

Every doctoral student will be assisted by a departmental advisor in the student's general area of study who will be responsible for approving defined fields, guiding the student to consultant faculty, and supervising the examinations.

Language Requirements. All students, except as specified below, must demonstrate a reading knowledge of one foreign language relevant to the field of graduate study no later than the end of the second year in the program. Normally, completion of the M.A. foreign language requirement will fulfill this requirement. Proficiency usually is established by passing a departmental examination administered by a faculty member proficient in the chosen language; students can also fulfill the requirement by obtaining a score of 500 or more on the appropriate ETS examination. Students in American history who have opted for a language substitute in completing the UCI Master's degree will be allowed to submit this work in fulfillment of the alternate skill requirement discussed below, and will not be subject to the time limit in achieving a foreign language competence.

Additional language requirements depend on the subject the student selects for the first "time-place" field and must be met before the student takes the candidacy qualifying examinations. An individual with a first "time-place" field in American history may either demonstrate a reading knowledge of a second useful foreign language (by passing a language examination designed by a faculty member or by achieving an ETS score of at least 500), or complete, as a doctoral student, a sequence of courses in an alternate skill (e.g., statistics, linguistics) that will be useful in mastering the chosen historical fields.

An individual with a first "time-place" field in a non-American subject must demonstrate a reading knowledge of a second foreign language.

Qualifying Examinations and Dissertation. After completing the appropriate courses and other preparatory work, the student will take written examinations in the History and Theory and two "time-place" fields, followed by the oral Qualifying Examination in the "focus" field, first "time-place" field, and dissertation topic. Upon successful completion of these examinations, the student will be advanced to candidacy and will begin intensive work upon the dissertation. The research and writing involved in this effort are expected to require from one to two years. At the end of this period an oral defense of the dissertation normally will be held, focusing on the adequacy of the student's research and thesis.

Students who enter with normal academic preparation and pursue a full-time program of study should be able to earn the Ph.D. degree within six years.

Undergraduate Courses

University Courses

Special studies of general interest for all students. No prerequisites. History 10 is the only departmental course which can be used to fulfill the American History portion of the American History and Institutions requirement.

6 Topics in Recent History (4-4-4). Historical analysis of forces which have shaped the contemporary world. Topics include war, revolution, communism and anticommunism, and new attitudes toward sex, family, and race. Topics vary.

9 Historical Problems (4-4-4). How historians define problems and answer them is shown through careful study of particular questions.

10 Survey of American History (4). Designed especially for students seeking to satisfy the History portion of the UC American History and Institutions requirement. Examines a number of leading issues in American life from colonial times to the present, including immigration, the role of slavery, industrialization, the rise of the United States as a world power, and its diversity of cultures.

11 Introduction to Peace and Conflict (4) F. Examines the causes and effects of international violence, focusing on World War I, World War II, and the Cold War. Relates what is known about the dynamics of war to what is understood by conditions of peace. Required for the Minor in Global Peace and Conflict Studies.

The Core Course

The Formation of Modern Society. Histories of Europe and the United States, focusing on general social transformation from traditional to modern industrial society. Humanities 15-16, when taken in conjunction with History 29B and 29C, may be used to satisfy the lower-division portion of the breadth requirement in writing. (I), (IV).

29A Traditional Societies: 1300-1815 (4) F. (IV)

29B The Impact of Industrialization: 1815-1900 (4) W. (IV)

29C The Twentieth-Century Crisis: 1900-Present (4) S. (IV)

Introductory Courses

Courses which indicate methods and premises of historical scholarship as well as survey particular fields. Designed for students with a particular interest in history. No prerequisites.

The Formation of Ancient Society. A unified view of the cultures of the Mediterranean world in Antiquity. Focuses on major institutions and cultural phenomena, as seen through the study of ancient literature, history, archaeology, and religion. Same as Classics 35A-B-C. (IV)

35A Origins of Greek Society (4) F. (IV)

35B Classical Greece (4) W. (IV)

35C Ancient Rome (4) S. (IV)

Latin American Survey. An overview of Latin American history from pre-Columbian civilizations to today. Topics include native cultures, European conquest, colonialism, independence, nation-building, economic development, foreign influences, social protests, and revolutions. (IV)

42A Pre-Columbian Civilizations and European Colonization (1200-1750) (4) F. (IV)

42B Independence and the Nineteenth Century (4) W. (IV)

42C Twentieth Century (4) S. (IV)

East Asia: Traditions and Transformations. A survey of the distinctive cultures and histories of China, Japan, and neighboring countries. The first quarter is devoted to premodern patterns of politics, thought, social organization, and economic activity. The second and third quarters focus principally upon the modern histories of China and Japan, with attention to the different responses to Western impact each country made. (IV)

43A Pre-Modern East Asia (4) F. (IV)

43B Modern China (4) W. (IV)

43C Modern Japan (4) S. (IV)

Crises and Revolutions. Study of turning points in world history, illustrating themes and methods of historical analysis. History 50A-B-C may be used as a substitute for the History 29A-B-C requirement for the History major upon petition to the Chair. Humanities 15-16, when taken in conjunction with 50B and 50C, may be used to satisfy the lower-division portion of the breadth requirement in writing. (I), (IV)

50A Premodern Crises and Revolutions (Before 1600) (4) F. Topics vary. (IV)

50B Modern Crises and Revolutions (1600-1917) (4) W. Topics vary. (IV)

50C Contemporary Crises and Revolutions (Since 1917) (4) S. Topics vary. (IV)

60 Introduction to the History of Science (4) F. The emergence of modern science between 1500 and 1800. Case studies to illuminate revolutionary change in science and the impact of science-based technology on society. (IV)

Historical Studies

Courses in which students gain experience in analysis, interpretation, and writing. No prerequisites.

Ancient History

The Roman Empire. Creation of a bureaucratic empire; rule by gentry and officers; official culture and rise of Christianity; social conflict and political disintegration.

103A Early Roman Empire (4)

103B Later Roman Empire (4)

105 The Classical Tradition (4)

Medieval Europe

110A Europe in the Early Middle Ages (4). Survey of Europe between 300 A.D. and 900 A.D. Topics include the breakup of the Roman Empire, barbarian invasions, spread of Christianity, rise of Islam, the Carolingian Empire, and the Vikings.

110B Europe in the Central Middle Ages (4). Survey of European history from ca. 900 to ca. 1300. Topics discussed include the growth of the economy, feudalism, the crusades, the rise of towns, the development of the church, popular heresy, and the rise of large-scale polities.

110C Europe in the Later Middle Ages (4). Survey of European history from ca. 1300 to ca. 1500. Topics include the Black Death, the crisis of the economy, the Hundred Years' War, peasant and urban uprisings, and the Great Schism.

112 Medieval Kingship (4). Examination of the role kings played in the medieval polities of which they were the nominal rulers.

114A England in the Early Middle Ages (4). Survey of English history from ca. 400 to ca. 1200. Topics discussed include the Anglo-Saxons, the Viking settlement, the Norman Conquest, the Angevin Empire, and the development of royal, legal, and administrative mechanisms.

114B Later Medieval England (4). Survey of English history between ca. 1200 and ca. 1500. Topics include the Magna Carta, the Barons' War, the Welsh and Scottish wars, the development of Parliament, the Hundred Years' War, and the Wars of the Roses.

116 Social Conflict in Medieval Europe (4). Examination of the social and political divisions in late medieval society that produced large-scale uprisings. Particular attention is given to the English Peasants' Rebellion, the Glyndwr uprising in Wales, and the Hussite movement in Bohemia.

118 Topics in Medieval Europe (4). Topics vary.

Early Modern Europe

120A Renaissance Europe (4). Survey of the Renaissance in Italy and in northern Europe.

120B Reformation Europe (4). Survey of the Protestant and Catholic Reformations in sixteenth- and seventeenth-century Europe.

120C Europe of the Old Regime (4). Survey of the social, cultural, and political history of Europe from the middle of the seventeenth century to the French Revolution.

122A Tudor England (4). Survey of English history from the fifteenth century until the early seventeenth century. Course concentrates on the formation of Tudor political, social, and economic institutions.

122B Stuart England (4). Survey of English history from the early seventeenth century until the early eighteenth century. Focus on the causes of the English Revolution and the Revolution itself, the Restoration, and the Protestant ascendancy.

122D Constitutional and Legal History: Anglo-Saxons to 1485 (4)

122E Constitutional and Legal History: From 1485 (4)

123 Topics in Early Modern English History (4). Topics vary.

124 Early Modern France (4). France from 1453 to 1789. Topics include the development of the modern state, social and economic changes, and events leading to the French Revolution.

126 Early Modern Spain (4)

128 Traditional Russia to 1685 (4)

129 Topics in Early Modern Europe (4). Topics vary.

Modern European History

130 Modern Europe. Political and social developments in England, France, and Germany.

130A Modern Europe: 1789-1850 (4)

130B Modern Europe: 1850-1914 (4)

130C Modern Europe: 1914 to Present (4)

132 European Intellectual and Cultural History. Main currents of Western French, and German thinkers.

132A The Enlightenment Europe (4)

132B Hegel to Nietzsche (4)

132C Freud to Sartre (4)

133 European International History. Wars, politics, and diplomacy of the major powers.

133A Origins of World War I (4)

133B World War I to World War II (4)

133C Europe Since 1939 (4)

134 British History. Britain from the Early Modern period to the present.

134A Modern Britain: 1715 to 1832 (4)

134B Modern Britain: 1832 to 1885 (4)

134C Modern Britain: 1885 to Present (4)

134D British Traditions: The Four Georges and Queen Victoria (4)

134E Australia and New Zealand: Colony to Commonwealth (4)

135 Modern France. Emphasis on social, economic, and cultural history of France since the Great Revolution.

135A The French Revolution and Napoleon (4)

135B France: 1815-1914 (4)

135C France: 1914 to Present (4)

136 Modern Germany. Political, social, economic, and cultural history from 1848 to the present.

136A Germany: 1848-1917 (4)

136B Germany: 1917 to Present (4)

137 Russian History. Political and social developments from traditional Russia to the present Soviet society.

137A Imperial Russia: 1689 to 1905 (4)

137B Russian Revolution and Soviet Society: 1905 to 1965 (4)

138 Modern Spanish History

138A Modern Spain: Liberalism, Ideology, and Dictatorship (4)

139 History and Prose Composition (4-4-4) F, W, S. Requires at least 4,000 words of assigned composition based upon historical works. Topics vary from quarter to quarter. History majors are given admission priority. Prerequisites: satisfaction of the lower-division writing requirement; junior standing or consent of instructor.

American History

140 The Development of the American Nation. Growth of a distinctively American society out of the colonial heritage; with emphasis on social and economic bases of culture and politics, sectionalism, industrialization, and the United States as a world power.

140A Colonial New England (4)

140B Colonial American South (4)

140C Revolutionary America (4)

140D-E Nineteenth-Century United States (4-4)

140F-G Twentieth-Century United States (4-4)

142 American Social and Economic History

142A Slavery and Freedom (4). A social history of slavery in America, emphasizing appropriate comparisons to slavery elsewhere in the world and to free labor in the United States.

142B Utopian Experiments in American History (4). Focus on the cooperative dimension of the American experience; the large number of intentional experiments in community living and alternative life styles in the nineteenth and twentieth centuries. Examination of both the ideological foundations of communitarianism and specific historical case studies.

142C California in Modern America (4). California as a case study of national trends and as a unique setting: its specific problems and culture. Major themes include: colonization, immigration, race relations, agricultural development, industrialization, urbanization, working class movements, social conflict, and political reform.

144 American Intellectual and Cultural History

144A Puritanism and the Enlightenment (4)

144B Transcendentalism and the Civil War Crisis (4)

144C Pragmatism, Marxism, and Neo-Conservatism (4)

146 History of American Foreign Relations

146B United States Foreign Relations Since World War II (4). Deals with relations between the U.S. and the remainder of the world since 1940, giving particular attention to U.S. "cold war" and "detente" with the communist powers, the growing ties with European and Asian allies, and the continuing impact on less-developed nations.

146C Imperialism in United States History (4)

148 A-B Religion and Society in the United States (4-4)

150A-B Women and the Family in the United States (4-4)

152 Topics in United States History (4). Topics vary.

Latin American History

160 Latin America

160A Colonial and National Period: 1300 to 1850 (4). Examines Native American societies from Mexico south before Columbus, the impact of Spanish and Portuguese colonialism on the formation of New World societies and economic systems, independence movements, and the subsequent struggles to create nation-states up to 1850.

160B Latin America Since 1850 (4). Economic, social, and political evolution from 1850 to today. Topics include export economies; industrialization; the Mexican, Cuban, and Central American revolutions; and military dictatorships.

161 Mexico

161A Indian and Colonial Societies (4)

161B Nineteenth Century (4)

161C The Mexican Revolution—Twentieth Century (4)

162 Brazil (4). Overview of social, economic, and political developments since 1500.

163 Central America and the Caribbean (4). Examination of the historical roots and causes of the contemporary unrest in Central America and the Caribbean, including events within the individual nations and the role of the major powers in the area.

166 United States—Latin America Relations (4). U.S. relations with Latin America with emphasis on the twentieth century. Topics include the Monroe Doctrine, Mexican-American and Spanish-American Wars, the Big Stick and Good Neighbor policies, and recent events in Central America and the Caribbean.

169 Topics in Latin American History—Special Studies (4). Topics vary.

Asian History

170 Asia

170A Pre-Modern Asia, Antiquity to 1800 (4). Origins to 1800, a survey of the philosophical, religious, literary, and artistic developments in China and Japan prior to extensive contact with western civilizations.

170B Modern Asia : 1800 to Present (4). Survey of the history of western (and then Japanese) imperialism, modernizing revolutions, social conflict, industrialization, and great power conflict.

172 China

172A Traditional China (4). An analysis of major themes in the development of Chinese society, economy, politics, and culture from earliest times to the late Imperial period.

172B Modern China (4). An analysis of major themes in the development of Chinese society, economy, politics, and culture from the late Ming Dynasty (ca. 1600) to the present.

174 Japan

174A Japan to 1800 (4)

174B Japan Since 1800 (4)

176 Topics in Pre-Modern Asia (4). Topics vary.

177 Topics in Modern Asia (4). Topics vary.

African History

178 Africa from Colonial Times to Independence (4). Broad examination of relations between Europe and Africa from the precolonial era to the present. Topics include the slave trade, the rise of nationalism, and the development of anticolonial resistance movements.

Special Studies. Topics with particular methodological foci. Content varies; departmental office has quarterly list of topics. May be repeated for credit.

180 Special Studies in Social History (4)

181 Special Studies in Economic History (4)

182 Special Studies in Intellectual-Cultural History (4)

183 Special Studies in International History (4)

184 Special Studies in Comparative History (4)

185 Special Studies in Social Theory (4)

186 Special Studies in History of Science (4) (IV)

187 Special Studies in Legal History (4)

Historical Research for History Majors

190 Colloquium (4) F, W, S. Specialized courses dealing primarily with close reading and analysis of secondary works; required reports and papers (critical essays). Each colloquium reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 15 students. Prerequisites: junior/senior standing and history major, or consent of instructor. Content varies. May be repeated for credit.

192A-B Senior Seminar (4-4). Specialized courses dealing primarily with analysis of historical problems and use of primary sources; required reports and paper (interpretive essay). Each seminar reflects the instructor's intellectual interests and is conducted as a discussion. Limited to 15 students. Prerequisites: senior standing and History major, or consent of instructor. Content varies.

195 Arms Control Simulation (4). A history of contemporary efforts to achieve arms control and a simulation of negotiations involving the delegations of two large nations.

198 Directed Group Study (4). Special topics through directed reading. Paper required. Prerequisites: consent of instructor; a minimum of two students must enroll.

199 Independent Reading (4). Investigation of special topics through directed reading. Paper required. Prerequisite: consent of instructor.

Graduate Courses

In addition to the following courses, graduate students in History might find these Humanities courses of special interest: Humanities 210 (Approaches to Linguistic Study); Humanities 220 (Literary Theory); and Humanities 230 (Philosophical Analysis).

History and Theory

200A-B-C History and Theory (4-4-4) F, W, S. Introduction to role of theory in historical writing, focusing on several major theorists, their relation to their setting, the structure of their thought, and its application to significant historical issues.

205A-B First-Year Research Seminar (4-4) F, W. Introduction to research methods, problems, and sources. Normally required of all entering graduate students. Substantial research paper required.

206A-B-C Second-Year Research Seminar (4-4-4) F, W, S. Three-quarter sequence required of all Ph.D. students. Normally taken during the second year of the Ph.D. program; not required for M.A. students. Includes review of the current state of the literature and practical experience in conducting research and writing a research paper.

Colloquia

210A-B-C The Literature and Interpretations of Ancient History (4-4-4). Historiography of Antiquity (Ancient Near East, Greece, and Rome to A.D. 395). Selected problems, philology and social thought, and directions of contemporary research. Emphasis on development of interpretations through scholarly dialogue.

220A-B-C The Literature and Interpretations of Early-Modern Europe.

220A Society and Economy (4)

220B Political History (4)

220C Intellectual and Cultural History (4)

230A-B-C-D The Literature and Interpretations of Modern European History (4-4-4-4)

230A Britain (4)

230B France (4)

230C Germany (4)

230D Russia (4)

250A-B-C The Literature and Interpretations of Latin American History (4-4-4). 250A: Colonial Period; 250B: Nineteenth Century; 250C: Twentieth Century.

260A-B-C The Literature and Interpretations of American History (4-4-4)**260A Seventeenth and Eighteenth Centuries (4)****260B Nineteenth Century (4)****260C Twentieth Century (4)**

280A-B-C Seminar in Southern History (4-4-4) F, W, S. Analysis of major works on the history of the southern United States, focusing on social groups, class and race relations, economic development, culture, and politics. An intercampus course taught jointly by participating faculty from the Irvine, Riverside, and San Diego campuses. Prerequisite: UCI participants must obtain consent of one of the UCI instructors.

282 Seminar in Medieval and Early Modern British History. (4) F, W, S. An intercampus seminar in Medieval and Early Modern British history that is taught both at the Huntington Library in San Marino and at UCI. Focuses on the development of thesis statements, thesis chapters, and/or publishable articles. May be repeated for credit 12 times.

284A-B-C Seminar in French History (4-4-4) F, W, S. The development of French society and culture from the Old Regime to the present. Can be used to fulfill the first-year research seminar requirement.

Special Studies

290 Special Topics (4-4-4) F, W, S. Lectures, readings, and discussion on subjects more limited in scope than those included in the year-long colloquia.

291 Directed Reading (4-4-4) F, W, S. Prerequisite: consent of instructor.

295 Special Methods (4-4-4) F, W, S. Development of particular research skills.

298 Experimental Group Study (4-4-4) F, W, S. Open to four or more students. Prerequisite: consent of instructor.

299 Dissertation Research (4-4-4) F, W, S. Prerequisite: consent of instructor; advancement to Ph.D. candidacy.

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Special Programs in the Humanities**Undergraduate Major in Humanities**

The interdisciplinary major in Humanities is one of the many options available to a student who wants to select a major in the School of Humanities. As such, the major in Humanities is on a par with the major in Spanish, the major in Classics, the major in Linguistics, and other majors in the School. The major in Humanities accommodates students who want to organize their undergraduate education around a humanistic perspective on a topic, a field, or a problem which is interdisciplinary in scope (e.g., Literature and Politics in Twentieth-Century America; The Problem of Community; Social and Religious Thought in the Age of the Reformation). The student enters the program at the end of the sophomore year and, in consultation with the Humanities Major Committee, devises an individually tailored set of "major requirements," not all of which need be offered in the School of Humanities. The Committee will assign an advisor on the basis of the student's own preference, if possible. At the end of the senior year the student will prepare, under the advisor's supervision, a long paper in the area of the special major. This requirement is satisfied by taking Humanities 199. A student majoring in the Humanities must also meet the regular School, UCI, and University requirements for graduation. (See p. 52 and p. 138.) Inquiries by third-quarter sophomores should be addressed to the Senior Academic Counselor in the School's Office of Undergraduate Study.

Residence Requirement: At least five upper-division courses in Humanities required for the major must be completed successfully at UCI.

Emphasis in Women's Studies**Faculty**

Jane O. Newman, *Director* (sixteenth- and seventeenth-century German literature, contemporary theory and criticism, feminism)

Daniel Brewer (eighteenth-century French literature, literary theory)

Michael L. Burton (cognitive anthropology, economic anthropology, cross-cultural comparisons, gender roles)

Francesca M. Cancian (sociology, social movements, social change, theory, family and friendship, gender roles)

David Carroll (literary theory, twentieth-century French literature)

Ken Chew (demography of the family)

Michael P. Clark (colonial American literature, critical theory)

Anne J. Cruz (Spanish Golden Age literature, comparative literature)

Emily Culpepper (feminist theory, women's spirituality, writing by women of color)

Cornelia Dayton (women in the United States; women and the law, 1600-1860)

Neil Elliott (linguistics)

Anne Friedberg (film history and theory, film and postmodernism, avant-garde and experimental film)

Wendy A. Goldberg (developmental psychology, social policy, biopsychology of parenting, family system)

Lucia Guerra-Cunningham (Latin-American literature, literary theory, women's studies)

Shelley Haley (women in antiquity)

Maria Herrera-Sobek (Latin-American and Chicano folklore, bilingualism)

Renée Riese Hubert (literature and fine arts, modern poetry, surrealism, Romanticism, comparative literature)

Michael P. Johnson (American social and political history)

Gregory S. Kavka (social and political philosophy)

Mary Ritchie Key (historical and comparative linguistics, American Indian languages, sociolinguistics, nonverbal communication)

Meredith Lee (lyric poetry, Goethe and eighteenth-century literature, German-Scandinavian literary relations)

Karen Leonard (social history of India, comparative history of women and the family, Asian-American social history)

Juliet Flower MacCannell, (eighteenth-century French literature, modern semiotics, comparative literature)

Robert Moeller (European women, women in modern Germany)

Alejandro Morales (Latin-American and Chicano literature, film studies)

Robert Newsom (nineteenth-century fiction)

Patricia A. O'Brien (modern French social history)

Julian Palley (modern Spanish literature)

Mark S. Poster (modern European intellectual history)

Leslie W. Rabine (nineteenth-century French literature, women's studies)

Eric Rentschler (German film, modern German literature, German comedy)

John Carlos Rowe (American literature, modern literature, critical theory, comparative literature)

Gabriele Schwab (modern fiction, critical theory)

John H. Smith (eighteenth- and nineteenth-century German literature and intellectual history, literary theory)

Aliko Songolo (French African and Caribbean literature)

Owen Thomas (history of English, American literature)

Gary Watson (ethical theory, philosophy of the mind, political philosophy)

The Women's Studies Emphasis of the Humanities major is designed to provide for the systematic inquiry into the relationship of women to culture and society. As an interdisciplinary course of study, the Emphasis in Women's Studies offers an opportunity for reflection upon these relationships from a variety of perspectives and from the broadest point of view. Courses focus on the cultural role of women, women's history, and women's socioeconomic condition, as all of these

have been conceived traditionally and as they are currently undergoing change in the modern world. The value of pursuing this Emphasis at this time will continue to increase as women come more and more to take positions of decision-making and leadership in determining the future shape and direction of cultural and social life. The Emphasis equips students with the proper critical tools for accomplishing the historically unprecedented tasks with which they are faced in contemporary life.

Career Opportunities

The degree in Humanities with an Emphasis in Women's Studies affords the student several options in diverse career fields in both the public and private sectors: several leading universities have begun to offer graduate training in women's studies; businesses and corporations, as more women join the workforce, are discovering needs for specialists in women's studies; and the growth of women's organizations, women's research centers, and women's resource organizations across the country and around the world (including the United Nations) indicate that opportunities for people with backgrounds in women's studies are growing and should continue to grow in the foreseeable future.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Program Requirements:

Humanities 55A, 55B, 55C; two courses from *each* of the following: Humanities 170, 171, 172; Humanities 173; one additional course from Humanities 170, 171, 172, 173, 174; Humanities 155; Humanities 199 in Women's Studies.

Residence Requirement: At least five upper-division courses required for the Emphasis must be completed successfully at UCI.

Program Requirements for the Minor:

Humanities 55A, 55B, 55C; Humanities 172; three courses from Humanities 170, 171, 173, 174.

Residence Requirement: At least four upper-division courses required for the minor must be completed successfully at UCI.

Women's Studies Courses (titles of individual courses listed under Humanities 170-174 will vary in accordance with their cross-listing).

Humanities 55A Women in History (4). Surveys the history of women with respect to fundamental social changes and to the ongoing transformation of the relations between the sexes. (IV)

Humanities 55B Women in Literature (4). Surveys the role of women in literature as authors, subjects, and readers. Generally emphasizes recent (i.e., eighteenth-, nineteenth-, and twentieth-century) texts, with some attention to literatures outside the European and Anglo-American traditions. (IV)

Humanities 55C Feminist Theory (4). Surveys basic texts concerning the role of femininity in Western ideologies. Students are introduced to the classics of feminist thought. (IV)

Humanities 139 Advanced Expository Writing: Topics in Women's Studies (4). Practice in writing clear and effective prose. Several essays of varying lengths, totaling at least 4,000 words. Prerequisites: satisfaction of lower-division writing requirement and junior standing.

Humanities 155 Special Topics in Women's Studies (4). Designed to provide students with an opportunity to do advanced work in women's studies. May be repeated for credit when topic changes.

Humanities 170 Women's Studies: Literature and Language. These courses are cross-listed with offerings from departments of literature and language when suitable; they include courses from disciplinary literature and linguistic departments and programs such as French, German, English and Comparative Literature, and Spanish.

170CA Undergraduate Seminars in Literary Theory and Practice (4) F, W, S.

170CB Undergraduate Lectures in Comparative Literature (4) F, W, S, Summer. Same as English and Comparative Literature CL103.

170CLA Topics in Classical Civilization (4). Same as Classics 170.

170TA Undergraduate Seminars in Literary Theory (4) W, S

170CD The Interdisciplinary Course (4) F, W, S, Summer. Same as English and Comparative Literature CL104.

170FA Topics in French Literature and Culture (4) F, W, S. Same as French 150A-B.

170GA Topics in German Literature 750-1750 (4). Same as German 117.

170GB Studies in the Age of Goethe (4). Same as German 118.

170GC Studies in Nineteenth-Century German Literature (4). Same as German 119.

170GD Studies in Twentieth-Century German Literature (4). Same as German 120.

170GE Topics in German Literature (4). Same as German 130.

170GF Writing About Literature (4). Same as German 139.

170GG Topics in German Literary Theory and Criticism (4). Same as German 140.

170GH German Literature in Translation (4) F, W, S. Same as German 150.

170GJ German Cinema (4). Same as German 160.

170LA Sociolinguistics (4). Same as Linguistics 150.

170LB Paralanguage and Kinesics (4). Same as Linguistics 154.

170RA Russian Literature 1800-1880 (4) F. Same as Russian 150A.

170RB Contemporary Russian/Soviet Literature (4) S. Same as Russian 150C.

170SA-B Chicano Literature (4-4). Same as Spanish 133A-B.

170SC Hispanic Civilization (4). Same as Spanish 110.

170SD Selected Topics in Spanish Literature (4). Same as Spanish 185.

Humanities 171 Women's Studies: History. These courses deal with women and gender from a historical focus. They are cross-listed with upper-division courses in history when the focus is on women and gender.

171A-B Women and the Family in the United States (4-4). Same as History 150A-B.

171C Special Studies in Social History (4). Same as History 180.

171D Colloquium (4). Same as History 190.

171E-F Senior Seminar (4-4). Same as History 192A-B.

Humanities 172 Women's Studies: Social Sciences and Social Ecology. These courses are cross-listed with courses offered in social sciences when the topics covered relate to women and gender.

172A-B Women's Studies Core Course I, II (4-4). Same as Social Sciences 183A-B.

172C Families that Work (4). Same as Social Sciences 154.

172D-DA Family and Community I-II (4). Same as Social Ecology S161B-C.

172E War, Peace, and Gender (4). Same as Social Sciences 161Z.

172F Cross-Cultural Study of Gender (4). Same as Social Sciences 131B.

172G Development of Sex Differences (4). Same as Social Ecology S148.

172H Sociology of Gender Roles (4). Same as Social Sciences 162M.

172J Women in Asia (4). Same as Social Sciences 134E.

Humanities 173 Women's Studies: Philosophy. These courses deal with philosophical issues related to feminism, women, and/or gender.

173A Philosophy and Sexual Politics (4). Same as Philosophy 185.

Humanities 174 Women's Studies: Women and the Arts. These courses focus on women and gender in relation to the arts, including film and fine arts.

174A Study in Film Genre (4). Same as Film Studies 112.

174B Classical Film Theory (4). Same as Film Studies 110A.

174C Contemporary Film Theory (4). Same as Film Studies 110B.

Humanities 199 Directed Research (varies). Directed research for senior Humanities majors.

Minor in Global Peace and Conflict Studies

Faculty

Dennis Aigner, Graduate School of Management
 Francesca Cancian, School of Social Sciences
 Gordon Chang, School of Humanities
 Joseph DiMento, Program in Social Ecology
 Lawrence Howard, School of Social Sciences
 Karl Hufbauer, School of Humanities
 Jon Jacobson, School of Humanities
 Gregory Kavka, School of Humanities
 Jon Lawrence, School of Physical Sciences
 Herbert Lehnert, School of Humanities
 Guy de Mallac, School of Humanities
 Julius Margolis, School of Social Sciences
 Calvin McLaughlin, School of Biological Sciences
 Seymour Menton, School of Humanities
 Keith Nelson, School of Humanities
 Riley Newman, School of Physical Sciences
 Frederick Reines, School of Physical Sciences
 Shawn Rosenberg, School of Social Sciences
 Sherwood Rowland, School of Physical Sciences
 Roland Schinzinger, School of Engineering
 Caesar Sereseres, School of Social Sciences
 Rein Taagepera, School of Social Sciences
 John Whiteley, Program in Social Ecology

The minor in Global Peace and Conflict Studies is an interdisciplinary curriculum designed to introduce the student to the phenomenon of international violence in the twentieth century, with particular attention to the danger of nuclear war and the challenge of creating a satisfactory and enduring peace. The minor is available through the School of Humanities, the Program in Social Ecology, and the School of Social Sciences. The minor and its courses, however, are open to all UCI Students.

Participants in the minor must complete the equivalent of nine courses, beginning in the sophomore year with an introductory series and culminating later with the Peace and Conflict Forum and its related seminar, usually taken during the senior year. The student selects the remainder of the courses comprising the minor from an approved list of upper-division courses and must organize these choices in consultation with a panel of the participating faculty into a coherent interdisciplinary program complementary to the student's major.

Requirements for the Minor:

Three lower-division courses: History 11 (Introduction to Peace and Conflict), Social Science 26D (The Nuclear Arms Race), Physics 16 (Physics of Nuclear Weapons).

Five relevant upper-division courses. Among those usually offered are: History 146B (American Foreign Relations Since

World War II), Social Sciences 123G (U.S. Foreign Policy), Social Sciences 123 (U.S. National Security), Social Sciences 113E (Political Economy of National Defense), Social Sciences 122A-B (Soviet Society and Politics), History 133A-B-C (European International History), Philosophy 182 (Issues in Social Philosophy), History 195 (Arms Control Simulation), Social Ecology S178, S179, S180 (Social Ecology of Peace), Social Sciences 161Z (War, Peace, and Gender).

With approval of the Global Peace and Conflict Studies faculty, relevant lower-division courses may be substituted for up to two of the five upper-division courses.

A minimum of two quarters of Humanities 180 (same as Social Sciences 123S or Social Ecology E184)—Peace and Conflict Forum—total of two units maximum for credit.

One quarter of Humanities 181 (same as Social Sciences 123T or Social Ecology E185)—Peace and Conflict Seminar—totaling two units, taken during winter quarter of the senior year.

Further information concerning the minor is available in the Global Peace and Conflict Studies office, 734 Social Science Tower; telephone (714) 856-6410.

Minor in Latin American/Chicano Studies

Core Faculty

Frank Cancian, School of Social Sciences
 Maria Herrera-Sobek, School of Humanities
 Seymour Menton, School of Humanities
 Alejandro Morales, School of Humanities
 Eloy Rodriguez, College of Medicine and School of Biological Sciences

Jaime E. Rodriguez, School of Humanities
 Arthur Rubel, College of Medicine and School of Social Sciences
 Steven Topik, School of Humanities

The minor in Latin American/Chicano Studies is an interdisciplinary curriculum designed to develop in students an awareness, knowledge, and appreciation of Latin American and Chicano issues in the areas of language, history, culture, sociology, anthropology, political science, health, folk medicine, literary studies, and creative accomplishments in art, music, and dance. Its goal is to promote not only knowledge of two important population groups, but also interracial, interethnic, intercultural, and international understanding. The minor is available through the School of Humanities and is available to all UCI students.

Students in the minor follow one of two tracks, the Latin American track or the Chicano track, and must complete eight courses. In addition, students must fulfill a language requirement of two years of college-level Spanish or Portuguese (or equivalent).

Requirements for the Latin American Track:

Spanish 2A-B-C (Intermediate Spanish) or Portuguese 140A-B through 145 (three courses, exclusive of those used to meet the minor requirements), or equivalent knowledge of Spanish or Portuguese.

One course in Latin American literature (Spanish-American or Brazilian) selected from: Spanish 101D (Introduction to Latin American Literature), 130A (Spanish-American Prose Fiction 1830-1920), 130B (Spanish-American Prose Fiction 1920-1950), 130C (Spanish-American Prose Fiction 1950 to Present), 131A (Spanish-American Poetry), 131B (Spanish-American National Literature), 131C (Spanish-American Theatre), 150 (Spanish-American Literature in Translation),

160 (Topics in Hispanic Film Studies, when topic is on Latin America), 186 (Selected Topics in Latin American Literature); Portuguese 140A-B (Brazilian Prose Fiction), 142 (Brazilian Short Story), 143 (Brazilian Poetry), 145 (Brazilian Theatre), 190 (Individual Studies).

One course in Latin American history selected from: History 42A (Pre-Columbian Civilizations and European Colonization), 42B (Independence and the Nineteenth Century), 42C (Twentieth Century), 161A (Mexico: Indian and Colonial Societies), 161B (Mexico: Nineteenth Century), 161C (Mexico: The Mexican Revolution, Twentieth Century), 162 (Brazil), 163 (Central America and the Caribbean), 166 (United States—Latin American Relations), 190 (Colloquium, when topic is on Latin America).

One course in Latin American social sciences selected from: Social Sciences 122U (Latin American Politics), 123N (Central America, Conflict Internationalization, and U.S. Policy), 131E (Economic Anthropology), 134R (Rural Mexico), 172F (Latin American Culture); Social Ecology E136 (Social Ecology of the Borderlands).

One course in Chicano Studies selected from: Spanish 110C (Hispanic Civilization, when topic is on Chicano history or culture), 133A-B (Chicano Literature), 134 (Chicano Culture), 186 (Selected Topics in Latin American Literature, when topic is on Chicano literature).

Three courses in Latin American Studies selected from: any of the courses listed above in the literature, history, and social sciences requirements; Spanish 50C (The Individual and Society in Hispanic Literature), 110A-B-C (Hispanic Civilization, when the topic is on Latin American countries; Portuguese 141 (Brazilian Civilization); Linguistics 133 (Indian Languages of the Americas); Social Sciences 131H (Urban Anthropology), 134K (Peoples and Cultures of Latin America); Biological Sciences 199 (Independent Study in Biological Sciences Research, when topic is medicinal biology and herbs in Mexico).

One seminar course on a topic related to Latin American studies selected from: History 190 (Colloquium); Spanish 190 (Individual Study); Social Sciences 129A-Z (Special Topics in Politics and Society), 139A-Z (Special Topics in Anthropology), 169A-Z (Special Topics in Sociology).

Requirements for the Chicano Track:

Spanish 2A-B-C (Intermediate Spanish) or Portuguese 140A-B through 145 (three courses, exclusive of those used to meet the minor requirements), or equivalent knowledge of Spanish or Portuguese.

One course in Chicano history or culture selected from: Spanish 110C (Hispanic Civilization, when topic is on Chicano history or culture), 134 (Chicano Culture); History 198 (Directed Group Study, when topic is on Chicano history).

One course in Mexican history selected from: History 161A (Indian and Colonial Societies), 161B (Nineteenth Century), 161C (The Mexican Revolution, Twentieth Century).

One course in Chicano literature: Spanish 133A-B (Chicano Literature).

One course in Mexican literature: Spanish 186 (Selected Topics in Latin American Literature, when topic is on Mexican literature).

Three courses in topics related to Chicano Studies chosen from outside the School of Humanities, selected from: Social Sciences 121B (Politics, Public Policy, and the Mexican-American), 172D (Chicano Culture); Social Ecology E136 (Social Ecology of the Borderlands).

One seminar course on a topic related to Chicano Studies selected from: History 190 (Colloquium); Spanish 190 (Individual Study); Biological Sciences 197A-B-C (Special Study in Biological Sciences); Social Sciences 129A-Z (Special Topics in Politics and Society), 139A-Z (Special Topics in Anthropology), 169A-Z (Special Topics in Sociology).

Further information concerning the minor in Latin American/Chicano Studies is available from Professor Jaime E. Rodriguez, 363 Humanities Office Building; telephone (714) 856-8165.

Concentration in Religious Studies

The undergraduate Concentration in Religious Studies encourages the student to examine religion and religious phenomena in the context of the several disciplines represented in the Schools of Humanities, Fine Arts, and Social Sciences. The Concentration, which is available with any major offered by these three Schools, is, for the most part, made up of courses already offered in the undergraduate curriculum; it allows the student to organize these courses, however, into a program complementary to the student's major. It is the objective of the Concentration that participating students expand their appreciation and understanding of religion in the context of their own major discipline while also developing critical abilities in the area of religious studies in its own right. While the Concentration takes as its subject all religion and religious phenomena and courses are offered in non-Western religious subjects, the academic specialties of the majority of the contributing faculty lie in Western traditions.

Students electing the Concentration are required to take eight one-quarter courses from those approved for the Concentration. The courses are gathered into three generic categories: religious theory and comparative religions, canonical literature, and topics in religious studies. Students take two courses from each category as well as two additional courses from among those approved for the Concentration. For further information and a quarterly list of courses available, please contact the Coordinator of the Concentration, 343 Humanities Office Building.

3-2 Program with the Graduate School of Management

Outstanding students who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the Graduate School of Management section for additional information.

Undergraduate Courses

The following set of courses has no necessary relation to the undergraduate interdisciplinary major in Humanities. Most of the courses are open to any UCI student. Humanities 1A-B-C is required for the major in Humanities, as it is a requirement of any student majoring in the School of Humanities. Also, Humanities 199 is required of any undergraduate in the School who elects an interdisciplinary major in Humanities.

Humanities 1A-B-C The Humanities Core Course (8-8-8) F, W, S. A freshman course required of all Humanities majors. Each year the course deals with problems of concern to the humanistic disciplines (history, literature, philosophy), emphasizing the careful reading of major texts that bear on these problems and developing the ability

to think clearly and write well about the issues they raise. A writing program is integral to the course and counts for half the grade each quarter. Students held for Subject A will earn an additional two units of workload credit, and *must* take the course for a letter grade. (I), (IV)

Humanities H2A-B-C Critical Issues in the Humanities (4-4-4) F, W, S. An interdisciplinary Honors sequence organized around a single topic or problem designed to compare and contrast modes of analysis in history, literary studies, and philosophy. Variable topics. Required of participants in the Humanities Honors Program. Prerequisites: consent of instructor and the Humanities Honors Program Committee.

Humanities 10 Humanities Core Course Adjunct (0) F, W, S. For students who need to develop and refine their academic skills to meet the rigorous demands of the Core Course. Using the reading and writing assignments of the Core Course, students are assisted in study skills, vocabulary development, critical reading, essay writing, and test-taking preparation. Four units of workload credit only. Corequisite: concurrent enrollment in the Humanities Core Course.

Humanities 15 Humanities Writing Sequence (4) W. First quarter of lower-division writing requirement of the breadth requirement, when taken with an associated course. For 1988-89 the associated courses are History 29A-B-C and History 50A-B-C. Rhetoric and composition instruction related to basic concepts in respective discipline of associated course. Students *must* enroll concurrently in associated course (listed quarterly in *Schedule of Classes*). (I)

Humanities 16 Humanities Writing Sequence (4) S. Second quarter of lower-division Writing Requirement of the breadth requirement, when taken with associated course (see Humanities 15). Research, organization, composition, and revision of essays in respective discipline of associated course. Students *must* enroll concurrently in associated course (listed quarterly in *Schedule of Classes*). (I)

NOTE: Humanities 20A-B-C-D through 22B are for students who have been admitted to UCI and whose scores on the ESL Placement Test indicate the need for additional work in English as a second language (see p. 41).

Humanities 20A-B-C-D Writing for Students for Whom English Is a Second Language (4-4-4-4). Grammar, sentence structure, paragraph and essay organization of formal written English. Pass/Not Pass only. Corequisite: Humanities 22A, if indicated by results of the ESL Placement Test. Prerequisite: ESL placement examination.

Humanities 21A ESL Speaking and Listening (2). Basic listening and speaking skills in five fundamental areas: pronunciation, lecture comprehension and discussion, academic oral reporting, informal interviewing, and nonverbal communication. Pass/Not Pass only. Prerequisite: ESL placement examination. Primarily for graduate students.

Humanities 21B ESL Speaking and Listening (2). Further development of listening and speaking skills: oral reporting, panel presentation, functional/situational dialogue, and public argumentation and debate. Primarily for graduate students. Pass/Not Pass only. Prerequisite: ESL placement examination.

Humanities 22A ESL Reading and Vocabulary (2). Intensive reading exercises with occasional practice in extensive reading, focusing on comprehension, development of vocabulary, syntax, rhetorical features, reading strategies, and study skills. Pass/Not Pass only. Corequisite: concurrent enrollment with Humanities 20A-B. Prerequisite: ESL placement examination.

Humanities 22B ESL Reading and Vocabulary (2). Extensive reading with emphasis on long magazine and journal articles, short stories, textbook chapters, notetaking, and the interpretation of charts, diagrams, tables, and figures. Pass/Not Pass only. Prerequisite: ESL placement examination.

Humanities 29 Special Topics in ESL (1-2). Directed and individualized work in English as a second language not covered in the Humanities 20, 21, 22 sequence. Pass/Not Pass only. Prerequisite: consent of ESL Director. May be taken more than once provided the topic changes.

Humanities 30A-B-C Literature and Society (4-4-4). An interdisciplinary introduction to literature within the context of social and political history, focusing on French, German, and Spanish literatures and societies. Variable topics. In English translation. 30A same

as French 30; 30B same as German 30; 30C same as Spanish 30. (IV) Not offered 1989-90.

Humanities 55A Women in History (4). Surveys the history of women with respect to fundamental social changes and to the ongoing transformation of the relations between the sexes. (IV)

Humanities 55B Women in Literature (4). Surveys the role of women in literature as authors, subjects, and readers. Generally emphasizes recent (i.e., eighteenth-, nineteenth-, and twentieth-century) texts, with some attention to literatures outside the European and Anglo-American traditions. (IV)

Humanities 55C Feminist Theory (4). Surveys basic texts concerning the role of femininity in Western ideologies. Introduction to the classics of feminist thought. (IV)

Humanities 60 Introduction to Public Address (4) F, W, S. Analysis of principles of communication and their application to informative and persuasive speaking. Emphasis on modes of persuasion and argumentation.

Humanities 61 Introduction to Advocacy (4) F, W, S. Theory and research on the effectiveness of various modes of communication used to influence the perceptions and behaviors of others. Students learn to construct and deliver a persuasive campaign. Prerequisite: Humanities 60 or consent of instructor.

Humanities 75 Library Research Methods (2) F, W, S. Search strategy techniques relevant for library research at UCI and other academic institutions, with emphasis on application of these techniques to individual research interests. Recommended for, but not limited, to students with assigned papers for other classes. Pass/Not Pass only.

Humanities 98 Issues in Humanities (2) F, S. Examines issues pertaining to the study of the humanities in the 1980s. Includes career and life options, graduate and professional schools, overview of skills, insights and advantages of humanities education. Pass/Not Pass only.

Humanities H139 Senior Honors Seminar (4) F. An interdisciplinary seminar for students in the Humanities Honors Program on problems in humanistic inquiry. Variable topics. Critical essays of varying lengths, totaling at least 4,000 words. Required of participants in Humanities Honors Program. Prerequisites: satisfaction of lower-division writing requirement; junior standing; consent of instructor or Honors Program Committee.

Humanities H140 Senior Honors Thesis (4) W. Directed independent research. Required of participants in the Humanities Honors Program. Prerequisite: consent of instructor or Honors Program Committee.

Humanities H141 Senior Honors Colloquium (4) S. Presentation and discussion of Senior Honors Theses. Emphasis on interdisciplinary reading and evaluation. Prerequisites: Humanities 140; consent of instructor or Humanities Honors Program Committee.

Humanities 155 Special Topics in Women's Studies (4). Designed to provide students with an opportunity to do advanced work in women's studies. May be repeated for credit when topic changes.

Humanities 170 Women's Studies: Literature and Language. These courses are cross-listed with offerings from departments of literature and language when suitable; they include courses from disciplinary literature and linguistic departments and programs such as French, German, English and Comparative Literature, and Spanish.

170CA Undergraduate Seminars in Literary Theory and Practice (4) F, W, S.

170CB Undergraduate Lectures in Comparative Literature (4) F, W, S, Summer. Same as English and Comparative Literature 103.

170CLA Topics in Classical Civilization (4). Same as Classics 170.

170TA Undergraduate Seminars in Literary Theory (4) W, S. Same as English and Comparative Literature CR100B.

170CD The Interdisciplinary Course (4) F, W, S, Summer. Same as English and Comparative Literature CL104.

170FA Topics in French Literature and Culture (4) F, W, S. Same as French 150A-B.

170GA Topics in German Literature 750-1750 (4). Same as German 117.

170GB Studies in the Age of Goethe (4). Same as German 118.
170GC Studies in Nineteenth-Century German Literature (4). Same as German 119.

170GD Studies in Twentieth-Century German Literature (4). Same as German 120.

170GE Topics in German Literature (4). Same as German 130.

170GF Writing About Literature (4). Same as German 139.

170GG Topics in German Literary Theory and Criticism (4). Same as German 140.

170GH German Literature in Translation (4) F, W, S. Same as German 150.

170GJ German Cinema (4). Same as German 160.

170LA Sociolinguistics (4). Same as Linguistics 150.

170LB Paralanguage and Kinesics (4). Same as Linguistics 154.

170RA Russian Literature 1800-1880 (4) F. Same as Russian 150A.

170RB Contemporary Russian/Soviet Literature (4) S. Same as Russian 150C.

170SA-B Chicano Literature (4-4). Same as Spanish 133A-B.

170SC Hispanic Civilization (4). Same as Spanish 110.

170SD Selected Topics in Spanish Literature (4). Same as Spanish 185.

Humanities 171 Women's Studies: History. These courses deal with women and gender from a historical focus and they are cross-listed with upper-division courses in history when the focus is on women and gender.

171A-B Women and the Family in the United States (4-4). Same as History 150A-B.

171C Special Studies in Social History (4). Same as History 180.

171D Colloquium (4). Same as History 190.

171E-F Senior Seminar (4-4). Same as History 192A-B.

Humanities 172 Women's Studies: Social Sciences and Social Ecology. These courses are cross-listed with courses offered in social sciences or social ecology when the topics covered relate to women and gender.

172A-B Women's Studies Core Course I, II (4-4). Same as Social Sciences 183A-B.

172C Families that Work (4). Same as Social Ecology S154.

172D-DA Family and Community I-II (4). Same as Social Sciences 161B-C.

172E War, Peace, and Gender (4). Same as Social Sciences 161Z.

172F Cross-Cultural Studies of Gender (4). Same as Social Sciences 131B.

172G Development of Sex Differences (4). Same as Social Ecology S148.

172H Sociology of Gender Roles (4). Same as Social Sciences 162M.

172J Women in Asia (4). Same as Social Sciences 134E.

Humanities 173 Women's Studies: Philosophy. These courses deal with philosophical issues related to feminism, women, and/or gender.

173A Philosophy and Sexual Politics (4). Same as Philosophy 185.

Humanities 174 Women's Studies: Women and the Arts. These courses focus on women and gender in relation to the arts, including film and fine arts.

174A Study in Film Genre (4). Same as Film Studies 112.

174B Classical Film Theory (4). Same as Film Studies 110A.

174C Contemporary Film Theory (4). Same as Film Studies 110B.

Humanities 180 Peace and Conflict Forum (1) F, W, S. A faculty-student forum that meets weekly and features lecturers from a variety of institutions discussing the issues of global peace and conflict. Prerequisite: consent of instructor. Same as Social Sciences 1235 and Social Ecology E184.

Humanities 181 Peace and Conflict Seminar (2) F, W. Students prepare a research paper under the direction of a faculty supervisor.

Open only to those enrolled in the Concentration in Global Peace and Conflict Studies. Same as Social Sciences 123T and Social Ecology E185.

Humanities 197 Individual Field Study (varying credit) F, W, S. Individually arranged field study.

Humanities 198 Directed Group Study (varying credit) F, W, S. Directed group study on special topics.

Humanities 199 Directed Research (varying credit) F, W, S. Directed research for senior Humanities majors.

Ph.D. with Interdisciplinary Emphasis in Humanities

The School of Humanities offers no degree called the Ph.D. in Humanities. However, some Ph.D. students in regular programs in the School may elect an interdisciplinary modification of their degree with the permission of the departments or programs concerned. Such students will do about 60 percent of their graduate work in a major field and about 40 percent in one or more minor fields. At least one of the student's courses will be in the Humanities series 200-230. Those interested in an interdisciplinary degree should contact the Associate Dean for Graduate Studies or the Graduate Advisor in their major department.

Emphasis in Critical Theory

An Emphasis in Critical Theory, under the supervision of the Committee on Critical Theory, is available for doctoral students in all departments of the School of Humanities. Each Ph.D. student in Humanities may, with Committee approval, complete the Emphasis in addition to the degree requirements of the student's graduate program. Although there is no change in the existing Ph.D. program requirements or procedures, if the student wishes to have a letter (signed by the Dean and by the Director of Critical Theory) testifying that the student has satisfactorily added this theoretical dimension to the graduate program, then additional requirements must be met: these consist of a sequence of courses in theory, a theoretical section on the qualifying exam, and a theoretical component in the dissertation. Critical theory at UCI is understood in the broad sense as the study of the shared assumptions, problems, and commitments of the various discourses in the humanities. The faculty regards critical theory not as an adjunct to the study of one of the traditional humanistic disciplines but as a necessary context for the study of any humanistic discipline.

In recognition of the interdisciplinary nature and goals of critical theory, the Committee on Critical Theory coordinates the activities of theorists from literary, historical, philosophical, and linguistic fields of study. The membership includes:

Mark Poster, Director of the Emphasis in Critical Theory,
 Director of the Critical Theory Institute, Professor,
 Department of History

Ellen Burt, Associate Professor, Department of French and Italian

David Carroll, Professor, Department of French and Italian
 Michael Clark, Associate Professor, Department of English and Comparative Literature

Lucia G. Cunningham, Professor, Department of Spanish and Portuguese

Jacques Derrida, Professor, Departments of English and Comparative Literature and French and Italian

Alexander Gelley, Professor, Department of English and Comparative Literature

Wolfgang Iser, Professor, Department of English and Comparative Literature

Murray Krieger, University Professor of English, Department of English and Comparative Literature

Jean-Francois Lyotard, Professor, Department of French and Italian

David McDonald, Associate Professor, Department of Drama
J. Hillis Miller, Distinguished Professor, Department of English and Comparative Literature

Gonzalo Navajas, Professor, Department of Spanish and Portuguese

Jane Newman, Associate Professor, Department of English and Comparative Literature

Leslie Rabine, Associate Professor, Department of French and Italian

John Carlos Rowe, Professor, Department of English and Comparative Literature

Gabriele Schwab, Professor, Department of English and Comparative Literature

David Smith, Professor, Department of Philosophy

Juan Villegas, Professor, Department of Spanish and Portuguese

The emphasis consists of six graduate courses in critical theory: a three-course sequence offered in several departments and designed to introduce students to major theoretical issues and their historical settings; and at least three advanced seminars which build on the student's historical competence in order to probe topics of contemporary interest. Additional theory courses are offered by several departments.

The Critical Theory Institute (CTI) is an important resource for graduate students in Humanities doctoral programs. To acquaint Humanities graduate students with the most recent developments in the field, the CTI augments its teaching and research resources by inviting visiting theorists for varying periods of residence. The campus library has strong holdings in critical theory, and students also have access to the resources of the recently acquired Rene Wellek Collection of the History of Criticism. The annual Wellek Library Lecture Series provides for an extended dialogue with major contemporary theorists.

For further information, please contact the Committee on Critical Theory, School of Humanities, University of California, Irvine; Irvine, CA 92717; (714) 856-4234.

Emphasis in the History and Philosophy of Science

An emphasis in the history and philosophy of science is available for doctoral students in the Departments of History and Philosophy. The Emphasis is administered by the Committee on the History and Philosophy of Science. Student participants must fulfill special course, examination, and dissertation requirements.

Graduate Courses

Graduate courses in Humanities are under the direction of the School's Associate Dean for Graduate Studies.

These courses are designed for all graduate students in the School of Humanities, with the exception that students in philosophy may not count Humanities 230 as part of their degree program.

Humanities 200, 210, 212, 220, and 230 introduce study in five disciplinary areas, either to students planning a degree in history or one of the literature departments or to those seeking familiarity with disciplines other than their own.

Humanities 200 The Nature and Theory of History (4) F. Introduction to various approaches to historical inquiry. Speculative and critical history, as well as analytical history. Same as History 200A.

Humanities 210 Approaches to Linguistic Study (4) S. Linguistic theories and methods of language description, linguistic structure, language change, typology of grammars, theories of meaning. For students unfamiliar with basic principles of linguistics.

Humanities 220 Literary Theory (4) F. Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists.

Humanities 230 Philosophical Analysis (4). Fundamentals of philosophical analysis through application of techniques to selected problems in various "fields" of philosophy: ethics, philosophy of science, political philosophy, aesthetics, philosophy of religion.

Humanities 270 Advanced Critical Theory (4-4-4) F, W, S. Seminars on various topics in critical theory. Students should have taken introductory courses before enrolling in these seminars.

Humanities 291 Interdisciplinary Topics (4) F, W, S. Group of seminars and colloquia in interdisciplinary topics or in topics in a particular discipline designed for students in other disciplines.

Humanities 399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Program in Linguistics

Faculty

Bernard Tranel, Ph.D. University of California, San Diego, *Director of the Program and Professor of French and Linguistics* (phonetics, phonology, morphology, French linguistics)

Richard Barrutia, Ph.D. University of Texas, *Professor of Spanish and Linguistics* (Spanish phonology, language acquisition, general applied linguistics including English as a Second Language and bilingualism)

Mary Ritchie Key, Ph.D. University of Texas, *Professor of Linguistics* (historical and comparative linguistics, American Indian languages, sociolinguistics, nonverbal communication)

Armin Schwegler, Ph.D. University of California, Berkeley, *Assistant Professor of Spanish and Linguistics* (history of Spanish, dialectology, historical linguistics, typology, Creoles)

Owen Thomas, Ph.D. University of California, Los Angeles, *Professor of Linguistics, English, and Education* (syntax, linguistics and education, computers and education, the teaching of writing, nineteenth-century American literature)

(See also the School of Social Sciences for additional faculty in Linguistics.)

Linguistics is concerned with descriptions of human languages, with theories that seek to explain the nature of language, and with the various uses of language. Additionally, linguistics has potential relationships with other disciplines concerned with language.

The undergraduate major in Linguistics, administered by an interschool Linguistics Committee, is offered by the School of Humanities and by the School of Social Sciences. Students are able to select a Linguistics major in either School according to their interests. A Linguistics minor is also offered.

There are three ways to major in Linguistics as an undergraduate. They are designated as Tracks I, II, and III.

Track I, *General Linguistics*, will appeal to students who wish to receive a broad introduction to the major subfields of Linguistics. Track I may be taken either through the School of Humanities or through the School of Social Sciences.

Track II, *Theoretical and Formal Linguistics*, will appeal to students interested in areas of the cognitive sciences such as psychology and artificial intelligence. Track II may be taken through either the School of Humanities or the School of Social Sciences.

Track III, *Applied Linguistics* (Language Teaching and English as a Second Language), will appeal to students interested in language teaching including but not limited to the teaching of English as a second language. Track III is available through the School of Humanities.

Students also may major in Classics, French, German, Russian, and Spanish with an emphasis in Linguistics.

Students are encouraged to consider a double major in Linguistics and either English or a foreign language. This is especially recommended for students following Track III. Students who double major may not satisfy requirements in one major with courses which count for the other major, unless the same course is required for both majors.

Careers in Linguistics

A major in Linguistics prepares students for a wide variety of careers in teaching, law, publishing, and public service, among others. Linguistics at UCI is also excellent preparation for graduate work in a number of areas. *General Linguistics* prepares students for advanced work in the field; *Theoretical and Formal Linguistics* students may continue work in formal linguistics, psychology, or other areas in the cognitive sciences; and those who concentrate in *Applied Linguistics* may pursue careers in the teaching of English as a second language or in other areas of language teaching.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Program Requirements for the Major

Track I General Linguistics

1. Introduction to Linguistics (Linguistics 50 or Social Sciences 3)
2. Two courses in each of the following Core Groups:
A-Phonetics, Phonology, and Morphology (110-119)
B-Syntax, Semantics, and Pragmatics (120-129)
C-Historical Linguistics (130-139)
D-Psycholinguistics (140-149)
E-Sociolinguistics (150-159) and Applied Linguistics (160-169)
3. One year of a foreign language other than the one used to satisfy the School of Humanities language requirement. Students are strongly urged to study a non-Indo-European language (such as Hebrew, Arabic, Chinese, Japanese, Swahili) whenever available.

Note that Linguistics 110 and 120 are prerequisites for many of the courses offered in their respective groups and should be taken as soon as possible.

Track II Theoretical and Formal Linguistics

1. Introduction to Linguistics (Linguistics 50 or Social Sciences 3)
2. Acquisition of Language (Linguistics 40)
3. Six upper-division courses: Linguistics 110, 112, 120, 122, 126, 142
4. Six upper-division elective courses selected from the following: Linguistics 114, 124, 128, 135, 140, 141, 143, 144, 180; Social Sciences 144K, 144L, 151T; Information and Computer Science 162

Track III Applied Linguistics (Language teaching and English as a second language)

1. Introduction to Linguistics (Linguistics 50 or Social Sciences 3)
2. Eight upper-division courses:
Linguistics 110, 120, 140, 160, 162, 164, 166, 168
3. Two upper-division elective courses in Linguistics
4. One year of a foreign language other than the one used to satisfy the School of Humanities language requirement. Students are strongly urged to study a non-Indo-European language (such as Hebrew, Arabic, Chinese, Japanese, Swahili) whenever available.

Residence Requirement: At least five upper-division courses required for the major must be completed successfully at UCI.

Program Requirements for the Minor

1. Three core courses:
Linguistics 50 or Social Sciences 3
Linguistics 110 and 120
2. Four additional upper-division courses in Linguistics. In the selection of these four courses, students are encouraged to refer to the program requirements for the three tracks of the Linguistics major and to consult with a Linguistics faculty member.

Residence Requirement: At least four upper-division courses required for the minor must be completed successfully at UCI.

Courses

40 Acquisition of Language (4). What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year-olds. Comparison of kinds of data on which these theories are based. Recommended: Linguistics 50 or Social Sciences 3. Same as Social Sciences 14A and 50A. (V)

50 Introduction to Linguistics (4) F, W, S. Emphasis on the notion that language is a remarkable achievement of the human mind. Current insights into the nature of language. Survey of various subfields of linguistics. Introduction to linguistic analysis. Same as Social Sciences 3. (Linguistics 50 and Social Sciences 3 may not both be taken for credit.) (V)

60 Language and Society: Gender and Language (4). Recent sociolinguistic approaches to the expression of gender in language are scrutinized with a view to understanding how patriarchal social forms may be reflected in speech style and how talk may be used to objectify persons sexually, reinforce sex roles, and encourage discrimination. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Social Sciences 19A and 50J.

80 Studies in Linguistics (4). Special topics at lower-division level. May be repeated for credit when topic changes. Same as sections of Social Sciences 49A-Z as appropriate.

110 Phonetics, Phonology, and Morphology (4). General phonetics with emphasis on articulatory phonetics, including practice in phonetic transcription. Phonological and morphological analysis of data from a wide variety of languages. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Social Sciences 141H. (V)

112 Advanced Phonology and Morphology (4). Phonological and morphological theories illustrated by analysis of data from a wide variety of languages. Prerequisite: Linguistics 110 or Social Sciences 141H. Same as Social Sciences 141I.

114 Morphology and the Lexicon (4). Study of the lexical representations of words; relation of the lexicon to phonology, morphology, and syntax, with special emphasis on recent developments in the theories of morphology and syntax. Prerequisites: Linguistics 110 and 120 or Social Sciences 141H and 141A. Same as Social Sciences 141G.

120 Introduction to Syntax (4). Linguistic intuition, well-formedness, constituent structure, transformation, derivation, argument, and counter-example. Emphasis on English syntax and what characterizes a linguistically significant generalization. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Social Sciences 141A. (V)

122 Advanced Syntax (4). Further topics in English syntax and theory of grammar. Constraints on what linguistic rules can do. The relationship between linguistic theory and language learning. Prerequisite: Linguistics 120 or Social Sciences 141A. Same as Social Sciences 141B.

124 Current Topics in Syntactic Theory (4). A small number of well-defined topics will be pursued intensively, with particular emphasis on recent articles that have had significant impact on the development of the theory of syntax. Prerequisite: Linguistics 122 or Social Sciences 141B. Same as Social Sciences 141C.

125 Structures of Non-Indo-European Languages (4). Nontechnical analysis of essential grammatical aspects of selected non-Indo-European languages. Comparison and contrast with aspects of the grammars of more familiar Indo-European languages (e.g., English and French) are emphasized. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Social Sciences 141F.

126 Semantics (4). Analysis of various proposals for the treatment of semantics in an integrated linguistic theory. The boundary between syntax and semantics. Coreference phenomena. Contributions from philosophy of language. Prerequisite: Linguistics 120 or Social Sciences 141A or consent of instructor.

128 Pragmatics (4). The study in linguistic theory of the use of language by speakers as a tool for communication in context. Prerequisite: Linguistics 120 or Social Sciences 141A. Same as Social Sciences 141E.

130 Historical Linguistics (4). Methods of historical analysis of language. Classification of languages and aspects of language change by internal reconstruction and the comparative method. Prerequisite: Linguistics 50 or Social Sciences 3. Recommended: Linguistics 110 or Social Sciences 141H. Same as Social Sciences 143A.

132 History of English (4). External (historical and social) and internal (linguistic) changes which have affected the English language from its Germanic roots to the present day. Recommended: Linguistics 50 or Social Sciences 3. Same as English 184 and Social Sciences 143B.

133 Indian Languages of the Americas (4). Survey of Indian languages illustrating sound systems and structures. Linguistic affinities between North and South American languages. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Social Sciences 143C.

135 Linguistic Theories as Psychological Theories (4). Examines the claim that a central foundational tenet of contemporary linguistics is that linguistic theories are a type of psychological theory pertaining to the nature of human knowledge. Critical discussion from linguistic, psychological, and philosophical perspectives. Prerequisites: Linguistics 50 or Social Sciences 3; Social Sciences 7. Same as Social Sciences 142A.

139 History of Linguistics (4). A course requiring at least 4,000 words of assigned composition based upon readings related to the history of linguistics. Linguistics majors are given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior status or consent of instructor. Same as Social Sciences 143D.

140 Theories of Second Language Acquisition (4). Research in the acquisition and learning of second and foreign languages. The influence of language acquisition theory on past and current teaching methodology. A comparison of first and second language acquisition. Prerequisite: Linguistics 50 or Social Sciences 3. Recommended: Linguistics 40 or Social Sciences 14A or 50A. Same as Social Sciences 142G.

141 Project in Child Language (4). Begins with an intensive review of previous work on child language in which problems and methodology are discussed and projects specified. Remainder devoted to the projects and to discussing the problems and results which arise from doing them. Prerequisite: Linguistics 40 or Social Sciences 14A or 50A or consent of instructor. Same as Social Sciences 142B and 156E.

142 Introduction to Psycholinguistics (4). Study of a particular topic in the psychology of language with particular emphasis on syntax and semantics. Same as Social Sciences 142C.

143 Readings in Child Language (4). In-depth reading and discussion of recent works in language acquisition. Concentration on relating research to contemporary linguistic theory. Prerequisite: Linguistics 40 or Social Sciences 14A or 50A. Same as Social Sciences 142E.

144 Language and the Brain (4). Analysis of current research on the biological bases of human linguistic capacity. Topics include development, focusing on hemispheric specialization and plasticity; the localization of specific linguistic functions in adults, with an emphasis on the study of aphasia; the relation of linguistic capacity to general cognitive capacity, considering especially research on retardation. Prerequisites: Biological Sciences 80 and 81 or Biological Sciences 105 or consent of instructor. Same as Social Sciences 142D and Biological Sciences 160.

150 Sociolinguistics (4). Sociolinguistic varieties of language examined from different points of view: geographical, temporal, and cultural. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Humanities 170LA and Social Sciences 144A.

152 American Dialects (4). A survey of the English-speaking dialects of the Americas. History of the making of atlases and dictionaries of the regional dialects. Special attention to phonological variation and sound change in progress. Prerequisite: Linguistics 50 or Social Sciences 3. Recommended: Linguistics 110 or Social Sciences 141H. Same as Social Sciences 144B.

154 Paralanguage and Kinesics (4). Channels of nonverbal communication which correlate with speech. Extra-speech sounds and body movements. Recommended: Linguistics 50 or Social Sciences 3. Same as Social Sciences 144C.

160 Methods of Teaching English as a Second Language (4). Methods and materials for teaching English to speakers of other languages. Includes methodology for teaching children, adolescents, and adults. Field experience required. Recommended: Linguistics 50 or Social Sciences 3 and Linguistics 140 or Social Sciences 142G. Same as Spanish 114 and Education 140C.

162 The Structure of English (4). An examination of American English phonology, morphology, and syntax. Intended primarily for prospective teachers of English in elementary and secondary schools and for teachers of English as a second language. Prerequisite: Linguistics 50 or Social Sciences 3. Same as English 181 and Social Sciences 144E.

164 Theory and Practice of Bilingual Education (4). Theoretical and historical framework for bilingual education as is currently practiced in the United States. Major theoretical research regarding bilingual education and language acquisition processes. Analysis of the historical context in which bilingual education is grounded in the United States. Examination of the various changes in government policy and perceptions. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Spanish 100A.

166 Methods of Teaching ESL Reading and Writing (4). Theoretical background concerning native and nonnative reading and writing processes. Discussion, demonstrations, and critiques of methods, techniques, and materials for teaching reading and writing. Prerequisite: Linguistics 50 or Social Sciences 3. Recommended: Linguistics 160 or Spanish 114 or Education 140C.

168 Testing and Language Assessment (4). Nature of language assessment, types of language tests, English as a second language and foreign language tests, basic testing statistics, development of tests for placement and specific situations. Prerequisite: Linguistics 50 or Social Sciences 3. Recommended: Linguistics 160 or Spanish 114 or Education 140C.

180 Studies in Linguistics (4). Topic varies depending upon availability and interest of faculty. May be repeated for credit as topics change.

190 Directed Readings (4). Investigation of special topics through directed reading. Paper required. Prerequisite: consent of instructor.

199 Independent Study (4)

200 Special Studies (4). Topic varies.

Additional Linguistics Courses

NOTE: For group classification of these courses consult an advisor or the Director of the Program in Linguistics before taking the course.

English

- English 187 Selected Topics in English Linguistics (4)
- English 200 Selected Topics in English Linguistics (4)

French

- French 11 French Phonetics (4)
- French 113 Topics in French Linguistics (4)
- French 131 Junior-Senior Seminar in Linguistics (4)
- French 200 Selected Topics in French Linguistics (4)
- French 201 History of the French Language (4)
- French 202 Contrastive French Phonology (4)
- French 203 Contrastive French Morphology and Syntax (4)
- French 208 Stylistics (4)

German

- German 103 German Phonetics (4)
- German 220 Selected Topics in German Linguistics (4)

Humanities

- Humanities 210 Approaches to Linguistic Study (4)

Philosophy

- Philosophy 150 Philosophy of Language (4)
- Philosophy 151 Advanced Philosophy of Language (4)

Russian

- Russian 100C Phonetics and Review Grammar (4)
- Russian 200 Selected Topics in Russian Linguistics (4)

Social Sciences

- Social Sciences 14B Linguistics and Literary Theory (4)
- Social Sciences 14C Language and the Mind (4)
- Social Sciences 50U Writing Systems and Written Language (4)
- Social Sciences 144K and 157A Introduction to Cognitive Semantics (4)
- Social Sciences 157B Cognitive Iconics (4)

Spanish

- Spanish 113A Spanish Phonetics (4)
- Spanish 113B Introduction to Spanish Linguistics (4)
- Spanish 115 Methods for Secondary Teachers of Spanish (4)
- Spanish 187 Selected Topics in Spanish Linguistics (4)
- Spanish 200 Second Language Acquisition (4)
- Spanish 201 History of the Spanish Language (4)
- Spanish 202 Spanish of the Southwest (4)
- Spanish 204 Recent Trends in Foreign Language Teaching (4)
- Spanish 205 Spanish Dialectology (4)

Chinese and Japanese

C1A-B-C Fundamental Mandarin Chinese (5-5-5) F, W, S. Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing. Taught completely in Mandarin Chinese using the Pinyin system of Romanization.

C2A-B-C Intermediate Mandarin Chinese (5-5-5) F, W, S. Conversation, reading, and composition skills; new Chinese characters introduced. Conducted in Chinese. Prerequisite: Linguistics C1C or equivalent. (V)

C3A-B-C Advanced Mandarin Chinese (4-4-4) F, W, S. Emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation. Conducted in Chinese. Prerequisite: Linguistics C2C or equivalent.

J1A-B-C Fundamental Japanese (5-5-5) F, W, S. Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing all three Katakana, Hiragana, and Kanji scripts. Conducted in Japanese.

J2A-B-C Intermediate Japanese (5-5-5) F, W, S. Conversation, reading, and composition skills; approximately 230 Kanji are introduced. Conducted in Japanese. Prerequisite: Linguistics J1C or equivalent. (V)

Department of Philosophy

Faculty

- Gary Watson, Ph.D. Princeton University, *Chair of the Department and Associate Professor of Philosophy* (ethical theory, philosophy of the mind, political philosophy)
- Ermanno Bencivenga, Ph.D. University of Toronto, *Professor of Philosophy* (logic, ancient philosophy, philosophy of language)
- David M. Estlund, Ph.D. University of Wisconsin, *Assistant Professor of Philosophy* (ethics, political and social philosophy)
- Gordon G. Globus, M.D. Tufts University, *Professor of Philosophy and Psychiatry and Human Behavior*
- Gregory S. Kavka, Ph.D. University of Michigan, *Professor of Philosophy* (social and political philosophy)
- Joseph F. Lambert, Ph.D. Michigan State University, *Professor of Philosophy* (logic, philosophy of science, metaphysics)
- Penelope Jo Maddy, Ph.D. Princeton University, *Associate Professor of Philosophy* (logic, philosophy, and foundations of mathematics)
- A.I. Melden, Ph.D. University of California, Berkeley, *Professor Emeritus of Philosophy* (ethics, philosophy of the mind, social and political philosophy)
- Alan Nelson, Ph.D. University of Illinois at Chicago, *Assistant Professor of Philosophy* (philosophy of science, history of seventeenth-century philosophy and science, philosophy of economics)
- Terence D. Parsons, Ph.D. Stanford University, *Professor of Philosophy* (metaphysics, philosophy of language)
- Nelson C. Pike, Ph.D. Harvard University, *Professor of Philosophy* (philosophy of religion, history of philosophy)
- Gerasimos Santas, Ph.D. Cornell University, *Professor of Philosophy* (ancient philosophy, history of philosophy, ethics)
- Martin Schwab, Ph.D. University of Bielefeld, *Assistant Professor of Philosophy and Comparative Literature* (aesthetics, philosophy of mind)
- Guy Sircello, Ph.D. Columbia University, *Professor of Philosophy* (philosophy of art, philosophy of the mind)
- Brian Skyrms, Ph.D. University of Pittsburgh, *Professor of Philosophy* (philosophy of science, metaphysics)
- David W. Smith, Ph.D. Stanford University, *Professor of Philosophy* (phenomenology, metaphysics, epistemology, existentialism)
- Roger N. Walsh, M.B., B.S., Ph.D. University of Queensland, *Professor of Philosophy and Psychiatry and Human Behavior*
- Peter Woodruff, Ph.D. University of Pittsburgh, *Associate Professor of Philosophy* (philosophy of logic, metaphysics)

Philosophy addresses itself to questions that arise insistently in every area of human experience and in every discipline within the university. Each discipline inevitably poses problems concerning the nature of the standards appropriate to it and the place of its subject matter within the total framework of human knowledge. If we are to understand science or art or literature, or such human practices as morality and religion, we are bound to address ourselves to philosophical issues relating to their nature, the uses of reason appropriate to them, and the contributions they make to our understanding and appreciation of ourselves and the world in which we live.

Careers for the Philosophy Major

The study of argument and the precision and clarity of thought and writing required of Philosophy majors are excellent preparation for a variety of careers. Many undergraduates trained in Philosophy go on to professional schools in medicine, business, or law. The analytical skills developed in Philosophy courses seem to be especially useful in legal education; indeed, many UCI Philosophy graduates have established fine records at top law schools. Former Philosophy students also have used their skills to advantage in careers in

government, business, teaching, law enforcement, and computer programming. Many Philosophy majors also continue their education at the graduate level, either in philosophy or a related discipline.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Undergraduate Program

Instruction in philosophy relies essentially upon discussion in which students are active participants. Wherever possible, therefore, classes are severely limited in size in order to permit sustained dialogues between student and instructor.

Some of the courses offered are of general interest to all students. Others are designed to explore issues that arise in selected and special disciplines. Among these are courses in the philosophy of science and of art. The staff should be consulted for advice about courses best suited to the specialized needs of particular students.

The program of course offerings is also designed for those majors in philosophy whose intention may be either to enter some professional school upon graduation (e.g., law) or to engage in graduate work in philosophy.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the Major

Philosophy 30, Philosophy 10 and 12 and either 11 or 13; two of the following: Philosophy 140A-B, 145A-B, or 170A-B; four additional quarter courses from Philosophy 101-199. Students planning to go on to graduate school are strongly advised to take Philosophy 130.

Residence Requirement: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

The minor consists of two portions: a lower-division portion and an upper-division portion. Both must be satisfied.

Lower division: Three courses selected from Philosophy 1, 4, 5, 30 or three courses selected from Philosophy 1, 6, 7, 30 or three courses selected from Philosophy 10, 11, 12, 13, 30.

Upper division: Four courses in a given subfield of philosophy, some of which have been pre-approved by the Department and are included below:

Value theory (ethics, political/social, beauty), which includes Philosophy 111, 170A-B, 171, 172, 180, 181, 182, 184, and 190.

Epistemology, philosophy of mind, and philosophy of science, which includes Philosophy 127, 145A-B, 155, 156, 160, 162, and 186.

Metaphysics and philosophy of religion, which includes Philosophy 122, 140A-B, 195, and 196.

Logic and philosophy of language, which includes Philosophy 122, 130A-B, 132, 133, 134, 150, 151, and 165.

History of philosophy, which includes Philosophy courses numbered between 100 and 129 and Philosophy 181.

Other four-course sequences may be possible, subject to written permission by the Department. Such a sequence must consist of related courses in a coherent subfield.

Residence Requirement for the Minor: Four upper-division courses must be successfully completed at UCI.

Graduate Program

Students are encouraged to seek the counsel of any and all members of the Department whose recommendations the student would deem helpful. It is hoped that there will be a close intellectual relationship between graduate students and professors in order to provide the students with optimum conditions for philosophical development and to expedite their progress toward advanced degrees. In addition, the Department sponsors a series of colloquia each year. Participation in these colloquia is an important part of the graduate student's training.

Every new graduate student is assigned a committee of faculty members whose purpose is to oversee the student's progress through the major requirements for the advanced degree. The student consults with the committee each quarter about progress and any administrative or academic difficulties. Each student's overall record is evaluated by the Department each year, customarily during the first two weeks of April. When the student has satisfied residency, language, logic, and portfolio requirements, the Candidacy Committee supervises the qualifying examination and the development of a dissertation project, and the subsequent writing of the dissertation itself. The Chair of this committee is the principal person with whom the graduate student will consult on the dissertation.

Master of Arts in Philosophy

There is no list of courses required for the M.A. degree. The M.A. program in Philosophy takes one year at a minimum. The student may elect to follow either of the following routes to the degree: write a thesis on a subject to be chosen in consultation with an advisor and defend the thesis in an oral examination, or satisfy the Logic and Portfolio requirements for the Ph.D. (see below). Please refer to the Graduate Studies and Research section for information on the minimum number of courses required for the M.A. degree.

Advancement to candidacy for the M.A. degree is not automatic, but requires formal application to the Dean of Graduate Studies and Research via the Philosophy Department Office. Application must be made with the recommendation of the Philosophy Department and must take place before the beginning of the quarter in which the student expects to receive the degree.

Doctor of Philosophy in Philosophy

There is no set number of courses required for the Ph.D., thus allowing course work to be tailored to the individual student's needs and interests. However, as a prerequisite for the Ph.D. degree, every student is required to have some experience in teaching.

The Ph.D. program is designed to take four years for the normally qualified student. In exceptional cases it may be possible to obtain the degree within three years. A Master's degree is not a prerequisite for the Ph.D. The following five items are requirements for the Ph.D. degree.

Tools of research, to be satisfied by demonstrating proficiency in a single appropriate foreign language* or by passing with a grade of B or better five to six courses at the graduate level in a discipline or disciplines outside of the Philosophy Department. Approval for the latter alternative will be granted by the Department only if, in its judgment, the courses form an integrated unit in light of the student's research interest.

*The foreign language examinations are administered by the Department of Philosophy. They are two hours in length and consist of translating, with the aid of a dictionary, passages from two authors. Students wishing information as to courses to prepare them for these examinations and dates when these examinations will be given should consult the Philosophy Department Office, 500 Humanities Office Building; telephone (714) 856-6525.

Logic Requirement: Students entering the program are expected to be familiar with elementary quantification theory and some natural deduction techniques. If they are not, students may take Philosophy 30 (no graduate credit is given for this course).

Students in the Ph.D. program must complete, with a grade of B or better, three courses in logic: 230A, which covers first-order predicate logic; 230B, which covers the completeness theorems; and one additional course requiring substantial use of logical or mathematical techniques. Mathematics 150B may be substituted for 230B, and Mathematics 150C may be used as the third course. Additional courses which satisfy the third-course requirement include courses in mathematical and philosophical logic, mathematics, computer science, and mathematical social science; others may be permitted by the Department on a case-by-case basis.

Portfolio of papers representing the student's best work in philosophy. The papers may be, or may be based upon, essays written for course work. Papers will be evaluated by the faculty for the purpose of determining whether or not the student is ready to seek admission to candidacy. The portfolio is due at the end of the fourth week of classes of the seventh quarter of residence.

Breadth Requirements. Historical Breadth: To be satisfied by receiving a grade of B or better in at least four courses covering at least three of the following five historical periods: Ancient, Medieval, Modern, Kant and nineteenth-century, and twentieth-century. **Field Breadth:** To be satisfied by receiving a grade of B or better in one course in metaphysics, one course in epistemology, and two courses in value theory. Both breadth requirements must be satisfied by the end of the seventh quarter of graduate study.

Advancement to candidacy and the writing of a thesis. Upon successful completion of the above requirements, the student will apply for advancement to candidacy for the Ph.D. degree by filling out the appropriate forms and returning them to the Philosophy Department Office. A Candidacy Committee including at least one member from an academic area outside of the School of Humanities is then appointed by the Graduate Council. This Committee administers an oral Qualifying Examination to determine whether the student is qualified to begin work designed to lead to the completion of a thesis.

Upon passing this oral examination, the student becomes a candidate for the Ph.D. degree. The Doctoral Committee appointed by the Graduate Council supervises the student's further course work and research, as well as the actual writing of the doctoral thesis.

The defense of the thesis. At a suitable point during the development of the thesis, the Doctoral Committee administers an oral examination, the focus of which is the content of

the thesis itself. If at all possible, this examination will be given while the student is still in residence.

Undergraduate Courses

1 Problems of Philosophy (4). An introduction to some basic philosophical problems, concepts, and methods. Emphasis on both discussion and writing. (IV)

2 Freshman-Sophomore Seminar in Philosophy (4). Introduction to the philosophical enterprise via a study of classical philosophical texts. Emphasis on classroom dialogue and critical writing. Open to upper-division students only with consent of instructor.

4 Introduction to Ethics (4). Selected topics from the history of ethics. Problems include the nature of the good life and the moral justification of conduct. (IV)

5 Contemporary Moral Problems (4). A study of some current moral issues, e.g., abortion, sexual morality, euthanasia, capital punishment, reverse discrimination, civil disobedience, and violence. (IV)

6 Philosophy and Psychoanalysis (4). An analysis of psychoanalytic theory and therapy, and of its significance for classical philosophical problems such as the mind-body problem, self-identity and self-deception, psyche and consciousness, innatism, and the origins of moral behavior.

7 Introduction to Phenomenology and Existentialism (4). A study of the doctrines of phenomenology and existentialism. Emphasis on their philosophical origins, contributions to traditional philosophical topics (e.g., metaphysics, epistemology, ethics) and influences on other disciplines (e.g., psychology, social science, literature, religion).

10 History of Ancient Philosophy (4). Examination of the central philosophical themes developed by the Pre-Socratics, Socrates, Plato, Aristotle, the Stoics, the Epicureans, and the Skeptics. (IV)

11 History of Medieval Philosophy (4). A study of some of the major theological and philosophical texts from the Medieval period. Philosophy 10 recommended as background. (IV)

12 History of Modern Philosophy (4). Major developments in Western Philosophy from Descartes to Kant. Readings from Descartes, Leibniz, Locke, Berkeley, Hume, and Kant. Philosophy 10 or 11 recommended as background. (IV)

13 History of Contemporary Philosophy (4). A study of recent philosophical developments in Anglo-American and Continental Philosophy. Figures to be studied may include Russell, Moore, Wittgenstein, Quine, Heidegger, and Sartre. Philosophy 12 is strongly recommended as background. (IV)

14 Introduction to Asian Philosophies (4). Introduction to the philosophies of India, especially Yoga, Buddhism, and Vedanta, and of China, especially Confucianism and Taoism. Emphasis on exploring the relevance and practical application of these ideas in our own lives.

30 Introduction to Logic (4). A study of argument in everyday contexts. Formalization of varying types of arguments and the criteria by which arguments are evaluated. (V)

31 Introduction to Inductive Logic (4). Philosophical questions about the foundations of scientific inference are discussed: the traditional problem of induction; the Goodman Paradox; the concept of cause; necessary and sufficient conditions and Mill's methods of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

60 Introduction to the Philosophy of Science (4). The characteristics and structure of the fundamental philosophical aspects of science. (IV)

95 Introduction to the Philosophy of Religion (4). A critical examination of some of the more important concepts used in Western theological literature. Topics include the nature and existence of God, miracles, and evil.

NOTE: Unless otherwise specified, one course in philosophy is required as a prerequisite for each of the following courses. In special cases this requirement may be waived.

100 Ancient Philosophy (4). Selected topics from writings of Plato and Aristotle, such as Aristotle's criticism of Plato's metaphysics, ethics, or politics.

101 Plato (4). The central issues in Plato's Dialogues. Topics include the nature of Socratic questions, Socratic ethics, Platonic ethics and social philosophy, Plato's theory of ideas and his views on knowledge and perception, language and art. Philosophy 10 is strongly recommended as background.

102 Aristotle (4). The basics of Aristotle's philosophy: his philosophy of language, logic, epistemology, philosophy of nature, metaphysics, ethics, and philosophy of art.

105 Medieval Philosophy (4). A study of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith and reason.

108 Continental Rationalism (4). A study of some of the philosophical texts of Descartes, Malebranche, Spinoza, and Leibniz. Philosophy 11 is strongly recommended as background.

111 Philosophy of Hobbes (4). A study of Hobbes' moral and political philosophy with focus on his *Leviathan*.

115 British Empiricism (4). Locke, Berkeley, and Hume with attention to the problems of substance, perception, and knowledge. Philosophy 11 strongly recommended as background.

117 Kant (4). The first half of the *Critique of Pure Reason*. Philosophy 11 is strongly recommended as background.

120 Nineteenth-Century Philosophy (4). A study of the major figures and movements in philosophy during the nineteenth century.

122 Frege (4). A study of Gottlob Frege's major philosophical writings on ontology, the foundations of mathematics and semantics.

125 Contemporary Analytic Philosophy (4). A selected topic such as the theory of perception, theory of action, free will, intentionality. May be repeated for credit.

127 Phenomenology (4). Foundations of phenomenology in Husserl. Backgrounds in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes. Topics include phenomenological method, theory of intentionality, meaning, perception, evidence, ego, other minds, intersubjectivity, and lifeworld.

128 Existentialism (4). Heidegger and Sartre with their backgrounds in phenomenology. Philosophy 7 or Philosophy 127 strongly recommended as background.

130A-B Intermediate Logic (4-4) F, W. Syntax and semantics for first-order logic. (V)

132 Topics in Mathematical Logic (4). Selected topics in advanced mathematical logic, e.g., proof theory, modal theory, recursive functions, set theory, combinatory logic. Prerequisite: Philosophy 130A-B or consent of instructor.

133 Philosophical Logic (4). Topics include free logic, modal logic, deontic logic, theory of descriptions, calculus of individuals. Topics vary from year to year. Prerequisite: Philosophy 130A-B. May be repeated for credit.

134 Philosophy of Logic (4). Philosophical questions raised by contemporary formal logic. Topics include the existence and nature of propositions, theory of entailment, descriptions and existential presuppositions. Prerequisite: Philosophy 130B or consent of instructor.

139 Writing Philosophy (4). Discussion of those aspects of writing that are of special importance in philosophy; special philosophical terminology, techniques for evaluating arguments, philosophical definitions and philosophical theories. A course requiring at least 4,000 words of assigned composition based upon philosophical readings. Philosophy majors are given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

140A-B Metaphysics (4-4). A study of one or more of the problems of "first philosophy," e.g., substance, free will, abstract entities, identity. Philosophy 140A is strongly recommended as background for 140B.

145A-B Theory of Knowledge (4-4). A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between knowledge and belief, and the nature of truth and certainty. Philosophy 145A is strongly recommended as background for 145B.

150 Philosophy of Language (4). Selected topics in the philosophy of language, e.g., reference and speech act theories, theories of meaning.

151 Advanced Philosophy of Language (4). More technical and intensive developments of topics introduced in Philosophy 150. Prerequisite: Philosophy 150 or consent of instructor.

155 Philosophy of Mind (4). Issues connected with the concept of mind, e.g., the relation between mind and body, the self, personal identity, perception, belief, memory, motivation, desire, consciousness, the unconscious.

156 Philosophical Psychology (4). Selected topics such as theories of love, self-deception, the emotions, motive and intention, empathy, and psychoanalysis.

160 Philosophy of Science (4). Problems in the philosophy of science, e.g., the nature of scientific explanation and confirmation, the limits of scientific explanation, the nature of mathematics. (IV)

162 Philosophical Foundations of Probability (4). Probability as limiting relative frequency, rational degree of belief or propensity. Bayesian inference. DeFinetti's theorem.

165 Philosophy of Mathematics (4). A study of the nature of mathematical entities and mathematical knowledge. Prerequisite: Philosophy 130B or consent of instructor.

170A-B Ethics (4-4). A study of some of the problems of contemporary moral philosophy. Philosophy 170A is strongly recommended as background for 170B.

171 Ethical Issues in Biology (4). A study of the important ethical issues connected with the theory and practice of biological sciences. Topics may include the morality of abortion, the just distribution of medical resources, the use of animals for experimental purposes, and the sociobiology controversy.

172 Ethical Issues in Engineering (4). Application of ethical theory to moral problems confronted by engineers, scientists, managers, and others involved in engineering. Topics include exercise of conscience and free expression within corporations; basis of professional obligations to the public; role of values in safety decisions; ethics codes; whistleblowing. Case studies. Same as Engineering 192.

180 Political Philosophy (4). A study of some of the central problems in political philosophy, e.g., the justification of authority, the concepts of the ideal state, political liberty, political obligation, and social justice.

181 History of Political Philosophy (4). A study of some of the classical works of political philosophy. Readings from Plato, Hobbes, Locke, Rousseau, Mill, and Marx.

182 Issues in Social Philosophy (4). A study of one or more of the social issues of current concern, e.g., nuclear deterrence, obligations to future generations, sociobiology and human nature, world hunger.

183 Morality and Nuclear Weapons (4). A study of moral issues concerning nuclear war, nuclear deterrence, and the arms race. Readings from the works of moral philosophers, theologians, and nuclear strategists.

184 Philosophy of Law (4). Legal systems and the concept of law. Topics include the nature and purpose of law, the nature of authority, the relation between law and morality, law and political-economic systems.

185 Philosophy and Sexual Politics (4). Consideration of the philosophical issues raised by feminism, e.g., traditional views of male/female nature, whether sexual equality is desirable, standards for judging sexual relations. Same as Humanities 173A.

186 Rational Action Theory (4). Selected problems in the theory of rational choice and action, e.g., subjective utility theory, subjective probability theory, choice under uncertainty, Newcomb's problem, Prisoner's Dilemma, Ellsberg's paradox, and the Surprise Attack problem. Prerequisite: one college-level course in mathematics or logic.

190 Aesthetics (4). Systematic presentation and defense of *A New Theory of Beauty*.

191 Theory of Art (4). Review and critique of one or more theories of art by traditional philosophers, e.g., Plato, Aristotle, Kant, Hegel, Schopenhauer, Dewey, or Heidegger.

194 Problems in the Philosophy of Religion (4). Classical problems in philosophical theology. Topics may include the attributes of God; arguments for the existence of God; and the Divine Command Theory of Ethics. Philosophy 95 is strongly recommended as background.

195 Phenomenology of Religion (4). Study of the phenomenology of religious experience as analyzed by Schleiermacher, Otto, and Buber. Attention is given to the mystical literature of the Christian tradition and to classical theories of divine attribution.

196 Christian Mysticism (4). A study of some of the texts of classical Christian mystical writers, e.g., St. Teresa of Avila, St. John of the Cross, Julian of Norwich. Emphasis on the phenomenological features of mystical experience. Philosophy 95 or 11 recommended as background.

199 Directed Special Studies (4)

Graduate Lecture Courses

200 Ancient Philosophy (4). Selected topics from writings of Plato and Aristotle, such as Aristotle's criticism of Plato's metaphysics and ethics of politics. May be repeated for credit.

205 Medieval Philosophy (4). A study of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith and reason. May be repeated for credit.

212 Modern Philosophy (4). Selected topics from the Rationalist and Empiricist philosophical literature. May be repeated for credit.

217 Kant (4). The first half of the *Critique of Pure Reason*.

225 Contemporary Analytic Philosophy (4). A selected topic such as the theory of perception, theory of action, free will and intentionality. May be repeated for credit.

227 Phenomenology (4). Foundations of phenomenology in Husserl. Backgrounds in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes. Topics include phenomenological method, theory of intentionality, meaning, perception, evidence, ego, other minds, intersubjectivity, and lifeworld. May be repeated for credit.

230A-B Intermediate Logic (4-4). Syntax and semantics for first-order logic.

232 Topics in Mathematical Logic (4). Selected topics in advanced mathematical logic, e.g., proof theory, modal theory, recursive functions, set theory, combinatory logic. May be repeated for credit.

233 Philosophical Logic (4). Topics include free logic, modal logic, theory of description, calculus of individuals. May be repeated for credit.

240A-B Metaphysics (4-4). A study of one or more of the problems of "first philosophy," e.g., substance, free will, abstract entities, and identity.

245A-B Theory of Knowledge (4-4). A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between knowledge and belief and the nature of truth and certainty.

250 Philosophy of Language (4). Selected topics in the philosophy of language, e.g., reference and speech act theories, theories of meaning.

255 Philosophy of Mind (4). Issues connected with the concept of mind, e.g., the relation between mind and body, the self, personal identity, perception, belief, memory, motivation, desire, consciousness, and the unconscious.

262 Philosophical Foundations of Probability (4). Probability as limiting relative frequency, rational degree of belief or propensity. Bayesian inference. DeFinetti's theorem.

265 Philosophy of Mathematics (4). Key problems relevant to the philosophical foundations of mathematics. Logicism, Intuitionism, Formalism, the nature of mathematical entities, mathematical truth.

266 Philosophy of Physics (4). Philosophical issues in the foundations of physics. Instrumentalism and realism, convention in physical theory, causation, probabilistic laws.

267 Philosophy of Biology (4). Examination of the basic conceptual and logical issues in biology. Reductionism, the status of biology as a science, teleological explanation, the logical structure of evolutionary theory, sociobiology.

268 Philosophy of Psychology (4). Philosophical problems in the foundations of psychological theorizing and the modeling of mind in cognitive psychology. The status of psychological mechanisms, the unconscious, mental states and processes, functionalism, problems of psychological explanations.

270A-B Ethics (4-4). A study of some of the problems of contemporary moral philosophy.

280 Political Philosophy (4). A study of some of the central problems in political philosophy, e.g., the justification of authority, the concepts of the ideal state, political liberty, political obligations, and social justice.

286 Rational Action Theory (4). Selected problems in the theory of rational choice and action, e.g., subjective utility theory, subjective probability theory, choice under uncertainty, Newcomb's problem, Prisoner's dilemma, Ellsberg's paradox, and the Surprise Attack problem.

290 Aesthetics (4). A systematic presentation and defense of *A New Theory of Beauty*.

295 Philosophy of Religion (4). Selected topics include the nature and existence of God, mystical experience, miracles, etc.

Graduate Seminars

Since seminar and graduate course topics vary with the occasions on which they are offered, they may be repeated for credit. Open to graduate students and upper-division undergraduates by consent of instructor.

In addition to the following courses, graduate students in Philosophy might find these Humanities courses of special interest: Humanities 200 (The Nature and Theory of History), Humanities 210 (Approaches to Linguistic Study), and Humanities 220 (Literary Theory).

203 Seminar in Ancient Philosophy (4). May be repeated for credit.

206 Seminar in Medieval Philosophy (4)

218 Seminar in Modern Philosophy (4). May be repeated for credit.

220 Seminar in History of Philosophy (4)

226 Seminar in Contemporary Philosophy (4). May be repeated for credit.

229 Seminar in Phenomenology (4)

235 Seminar in Logic (4). May be repeated for credit. Satisfactory/Unsatisfactory only.

236 Logic Workshop (4). May be repeated for credit. Satisfactory/Unsatisfactory only.

241 Seminar in Metaphysics (4)

246 Seminar in Theory of Knowledge (4). May be repeated for credit.

252 Seminar in Philosophy of Language (4). May be repeated for credit.

257 Seminar in Philosophy of Mind (4). May be repeated for credit.

261 Seminar in Philosophy of Science (4). May be repeated for credit.

272 Seminar in Ethics (4). May be repeated for credit.

283 Seminar in Social and Political Philosophy (4). May be repeated for credit.

293 Seminar in Aesthetics (4). May be repeated for credit.

297 Seminar in Philosophy of Religion (4). May be repeated for credit.

299 Directed Research (4-4-4)

300 Visitor's Graduate Seminar (4-4-4-4). Presentations by visiting distinguished philosophers.

399 University Teaching (4-4-4). Required of and limited to Teaching Assistants.

Program in Russian

Faculty

Michael A. Green, Ph.D. University of California, Los Angeles, *Director of the Program in Russian and Associate Professor of Russian* (eighteenth-century Russian theatre and literary theory, Pushkin, Chekhov, Kuzmin, Russian Symbolist theater, Russian literature and theater of the 1920s—Pilnyak, Olesha, relations between literature and the arts, Russian painting and music)

Harold Baker, Ph.D. Brown University, *Assistant Professor of Russian* (role of landscape description in nineteenth-century prose, James Joyce's *Ulysses*)

Guy de Mallac, Ph.D. Cornell University, *Professor of Russian* (modern Russian literature, peace studies, philosophy of nonviolence, Tolstoy's thought, Gandhi's thought, religious studies, Russian intellectual thought, Pasternak's life and work)

Russian is a language spoken by 215 million people in the Soviet Union and ranks with English and Chinese as one of the three major world languages. Russian is a language of the Indo-European family and is thus related to English, French, and German. Russian is an infinitely rich language, as is English, and adapts itself well to a variety of styles and genres from lyric poetry to the seeming harshness and brashness of the futurist poets.

For the first two years, the Program in Russian emphasizes a combination of speaking, writing, and reading skills. At the end of the senior year, the student can expect to have attained a rather high level of proficiency in all language skills—reading, writing, speaking, and understanding. By then students will have read a number of selected literary texts—including a fair portion of the significant masterworks—in the original. They will also have familiarized themselves with some of the historical background of the language and with its relation to other Slavic and European languages. And they will have achieved a reasonable degree of familiarity with the major cultural and social trends in Russian history and thought.

In addition to the regular Russian major with emphasis on language and literature, the Program in Russian offers a modified major with emphasis on linguistics. This major was designed for those students who have no plans to pursue advanced study in Russian literature, while they wish to focus on the study of the structure of Russian viewed within the framework of Slavic and general linguistics.

The Program in Russian also offers a major with an emphasis in Russian civilization, which is geared to the interests of students who do not intend to specialize in Russian language and literature. This emphasis is based upon a multidisciplinary approach (through language, the arts, thought, literature, history, study of institutions) to the rich variety of a culture that both before the Revolution and during the Soviet period has made an important contribution to mankind's cultural heritage. Various specializations and challenging new career possibilities in today's world are available to students electing this option.

Two minors are also offered by the Program. The Russian Language minor is geared to the student who already has a good command of the language and who wishes to strengthen language skills while acquiring knowledge of Russian literature in the original. Students whose main interests are cultural and historical will find the Russian Area Studies minor of value.

Students planning to major or minor in Russian should contact the Program Office to obtain the most current information. Students are placed in Russian courses according to their years of previous study. In general, one year of high school Russian is equated with one quarter of UCI work.

Thus, students with one, two, three, and four years of high school Russian will enroll in Russian 1B, 1C, 2A, and 2B, respectively. Exceptions to this placement formula must be approved by the Program Director. Students with high school training in Russian should consult with the Russian staff before enrolling in Russian courses. Students with transfer credit for college-level Russian may *not* repeat those courses for credit.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Program Requirements for the Major

Russian Major with Emphasis on Literature: Russian 100A-B-C; 101A-B-C; 110A-B-C; 150A-B-C; 180; any two of the following: 20; 30; 40; 160; 170.

Russian Major with Emphasis on Linguistics: Russian 100A-B-C; 101A-B-C; two courses from 110A-B-C; two courses from 150A-B-C; 180; Linguistics 50; 110; 120; 130.

Russian Major with Emphasis on Civilization: Russian 20; 30; 40; 100A-B-C; 150A-B-C; two courses from 101A-B-C; three courses from History 137A-B, Social Sciences 122A, and any other Russian or Soviet studies course approved by the Program; choice of one course from 110A-B-C, 160, 170, 180.

Residence Requirement: At least five upper-division courses required for the major must be completed successfully at UCI.

Program Requirements for the Russian Language Minor

Seven upper-division courses including Russian 100A-B, 101C, two courses selected from Russian 110A-B-C, two courses selected from Russian 100C and Russian 101A-B; remaining course selected from Russian 110A-B-C, 150A-B-C, 180, or any upper-division Russian course approved by the Program.

Residency Requirement for the Russian Language Minor:

Four upper-division courses must be successfully completed at UCI.

Program Requirements for the Russian Area Studies Minor

Russian 1A; two courses selected from Russian 150A-B-C; History 137A-B; choice of three courses from the following: Russian 1B-C, remaining course of Russian 150A-B-C, Russian 180; and either *one* of Social Sciences 122A or any other Russian area studies course approved by the Program.

Residency Requirement for the Russian Area Studies Minor:

Four upper-division courses must be successfully completed at UCI.

Planning a Program of Study

The Program in Russian believes in close consultation with students on academic advising, program planning, and discussion of goals and direction. Students planning to major in Russian with an emphasis on literature or on linguistics are strongly urged to consult with the departmental faculty as early as possible, in order to familiarize themselves with the nature of the various programs.

After indicating an intention to major in Russian, the student is assigned to an academic advisor who will help in the task of selecting courses toward the completion of one of the three

options open to students majoring in Russian studies at UCI. Special attention is paid to the unique aspects of the Russian field. In particular, students' attention is alerted to the combined academic and career implications and potentialities of these major options.

Career Opportunities

The major in Russian may lead to a career with the federal government, in private enterprise, or in education.

The U.S. Departments of State, Defense, Health and Human Services, the Information Office, and the Library of Congress all hire people who can speak and write Russian. The United States Information Agency's Voice of America offers opportunities in research, scriptwriting, editing, translating, and announcing.

Because of the importance of Russia in world politics and economics, private businesses and corporations dealing in the international marketplace increasingly employ persons skilled in Russian language and knowledgeable about Russian society and political institutions. Individuals with degrees in Russian may find employment in private enterprise as interpreters and translators in the following areas: library science, communications media, science, and technology.

Students who major in Russian may either go on to graduate programs or enter a career in education. Many students have entered teaching at the secondary level, while others, after graduate work in education, seek positions at colleges and universities.

Since Russian is second only to English as a world language of science, the study of Russian provides access to a large body of the world's scholarly, scientific, and technical literature. While the study of Russian language, literature, and civilization provides training that may lead to careers similar to those described above, the major program is viewed primarily as a valuable component of a liberal education and an instrument for the investigation and appreciation of the modern world.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Lower-Division Courses

1A-B-C Fundamentals of the Russian Language (5-5-5) F, W, S. Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene. Credit will be given only once for the Russian fundamentals sequence taken as Russian 1A-B-C or R1A-B-C.

R1A-B-C Fundamentals of Russian (with emphasis on reading) (5-5-5) F, W, S. For students not planning to major in Russian who wish to develop rapid reading ability in Russian. Not offered every year. Credit will be given only once for the Russian fundamentals sequence taken as Russian 1A-B-C or R1A-B-C.

2A-B-C Second-year Language Study (4-4-4) F, W, S. The student can expect to read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue. (V)

12 Scientific, Technical, and Nonliterary Russian (4) S. Exposes the students to the typical terminology and idiomatic constructions common to natural and social sciences, economics, and computer science, technology, and commercial correspondence. Representative selections from major scientific publications and technical manuals examined and analyzed. Students train in the skills of interpreting and translating typical samples of scientific, commercial, and technical prose, and receive individual guidance. May be repeated for credit when topic changes. Not offered 1989-90.

20 Russian Civilization: Tsars to Commissars (4) F. Definition of Russian culture from the medieval to the modern period, with attention to political, philosophical, and literary interpretations. The power structures are related to their impact on the cultural scene. Based on a multidisciplinary approach. Lectures, readings, and discussions in English. (IV)

30 Survey of Russian Drama: From Icon to Biomechanics (4) W. Traces the development of the Russian theatre through the Symbolist drama to Futurism and the post-Revolutionary era. Discusses innovation of twentieth-century stage directors; cinematic versions of selected plays are shown. Lectures, readings, and discussions in English. (IV)

40 Russian Intellectual Thought: Prophets, Rebels, Mystics (4) S. Major exponents of Russian thought: religious, rationalist, and radical. Focusing on the polarity between religious-philosophical trends and radical systems and ideologies. Lectures, readings, and discussions in English. (IV)

Upper-Division Courses

100A-B Third-year Language Study (4-4) F, W. Continuation of second-year program, with emphasis on grammar review, development of oral and written composition skills, and reading comprehension.

100C Phonetics and Review Grammar (4) S. Contrastive analysis of sounds and intonation of Russian. Grammar concentrates on some of the more difficult points.

101A-B Fourth-year Language Study (4-4) F, W. Advanced study of morphology, syntax, and stylistics. The aim is to enhance comprehension and develop vocabulary at the conceptual level of oral and written exposition. Reading and analysis of literary and nonliterary texts; advanced study of morphology, syntax, and stylistics; exploration of translation techniques. Lectures, discussion, and term papers in Russian. Open to qualified nonmajors by consent of instructor.

101C The History and Development of the Russian Literary Language (4) S. Philological introduction to the development of literary language from the eleventh through the twentieth centuries. Analysis of modern style from the viewpoint of previous changes in the language.

110A Nineteenth-Century Russian Literature (4) F. First course in a three-quarter sequence covering the development of Russian literature from classicism to modernism, stressing the evolution of Russian narrative prose and poetry. Selected masterpieces of the major Russian writers from Pushkin to Turgenev within the milieu of the Western literary tradition and in the Russian cultural and socio-political context. Discussion conducted largely in Russian.

110B Development of Russian Literature 1860s-1920s (4) W. Development of Russian literature from 1860s-1920s during the period of modernism and revolutionary experimentalism. In Russian.

110C Contemporary Russian Literature (4) S. Study of typical works of "Socialist Realism" and of literature of the post-Stalinist era, focusing on the renaissance of critical or psychological realism in the 1960s and 1970s. Reading and discussion in Russian.

139 Writing about Literature (4) F, W, S. Requires at least 4,000 words of assigned composition based upon readings in Russian literature (in English translation). Several essays required. Topics vary from quarter to quarter. Russian majors are given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior status or consent of the instructor. Same as Russian 150A, 150B, or 150C with writing component.

150A Russian Literature 1800-1880 (4) F. Development of Russian literature from classicism to modernism, stressing the evolution of Russian realism and the novel. Selected masterpieces of the major Russian writers from Pushkin to Dostoevsky within the milieu of the Western literary tradition and in the Russian cultural and socio-political context. May be taken as 139 to satisfy upper-division writing requirement. Same as Humanities 170RA.

150B Russian Literature 1880-1930 (4) W. Development of Russian literature from 1880s to 1930s during the period of modernism until the imposition of "Socialist Realism." May be taken as 139 to satisfy upper-division writing requirement.

150C Contemporary Russian/Soviet Literature (4) S. Study of major works of "Socialist Realism" and of literature of the post-Stalinist era, focusing on the renaissance of critical/psychological realism in the 1960s and 1970s. May be taken as 139 to satisfy upper-division writing requirement. Same as Humanities 170RB.

160 The Russian Cinema (4) W. Russian cinema from historical, theoretical, and comparative perspectives. Implications for Russian society and impact on Russian literature. Discussions and readings in English. Content varies with instructor. May be repeated for credit when topic changes. Same as Film Studies 160.

170 Russian Literature (in Translation) (4) S. An exploration of a specific period or problem in Russian literature. Lectures, reading, and discussion in English. Topic varies. May be repeated for credit when topic changes.

180 Major Russian Literary Figure (4-4-4) F, W, S. The study of a major Russian literary figure of the nineteenth or twentieth century. Topic varies. Lectures, reading, and discussion in English. May be repeated for credit when topic changes.

NOTE: Courses numbered 198-291 are by special consent and arrangement, to be taken only when the materials to be studied and the topics to be pursued are not offered in scheduled courses by the Program, when the student will not have a formal chance to pursue the subject of interest in the course of the academic year. Before enrolling in these courses, students must have the consent of the instructor and the Program Director, and must submit a written description of the course plan to the Director by the end of the first week of instruction.

198 Guided Group Study (4) F, W, S. Special topics in Russian studies through directed reading and research. Consultation with instructor is required prior to registration. May be repeated for credit when topic changes.

199 Special Studies in Russian (1 to 4 per quarter) F, W, S. Opportunity to study on an individual basis topics of special interest. By consent of instructor. May be repeated for credit when topic changes.

200 Selected Topics in Russian Linguistics (4) S

220 Studies in Russian Literature (4) W

291 Guided Reading Course (4)

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Department of Spanish and Portuguese

Faculty

Juan Villegas, Ph.D. Universidad de Chile, *Chair of the Department and Professor of Spanish* (literary theory, modern Spanish literature, Chilean poetry)

Richard Barrutia, Ph.D. University of Texas, *Professor of Spanish and Linguistics* (applied linguistics, bilingualism and English as a second language)

Juan Bruce-Nova, Ph.D. University of Chicago, *Professor of Spanish* (Latin American and Chicano literature)

Anne J. Cruz, Ph.D. Stanford University, *Associate Professor of Spanish* (Golden Age Spanish and comparative literature)

Lucía Guerra-Cunningham, Ph.D. University of Kansas, *Professor of Spanish* (Latin American literature, literary theory, and women's studies)

María Herrera-Sobek, Ph.D. University of California, Los Angeles, *Professor of Spanish* (Latin American and Chicano folklore, bilingualism)

Seymour Menton, Ph.D. New York University, *Professor of Spanish and Portuguese* (Latin American literature, prose fiction)

Alejandro Morales, Ph.D. Rutgers University, *Professor of Spanish* (Latin American and Chicano literature, film studies)

Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (nineteenth- and twentieth-century Spanish literature and critical theory)

Héctor Orjuela, Ph.D. University of Kansas, *Professor of Spanish* (Latin American literature, poetry and essay)

Julian Palley, Ph.D. University of New Mexico, *Professor of Spanish* (modern Spanish literature)

Armin Schwegler, Ph.D. University of California, Berkeley, *Assistant Professor of Spanish and Linguistics* (history of Spanish, dialectology, historical linguistics, typology, Creoles)

Dayle Seidenspinner-Núñez, Ph.D. Stanford University, *Associate Professor of Spanish, and Associate Dean of Humanities, Undergraduate Studies* (medieval Spanish and comparative literature)

Undergraduate Program in Spanish and Portuguese

The main objectives of the program in Spanish and Portuguese are to develop competence in the ability to understand, speak, read, and write Spanish and Portuguese, and to provide through the knowledge of these two languages an understanding and appreciation of their literature and culture.

Students are placed in Spanish courses according to their years of previous study. In general, one year of high school Spanish is equated with one quarter of UCI work. Thus, students with one, two, three, and four years of high school Spanish will enroll in Spanish 1B, 1C, 2A, and 2B, respectively. Exceptions to this placement formula must be approved by the appropriate course director. Students with transfer credit for college-level Spanish may *not* repeat those courses for credit.

All courses in Spanish and Portuguese, unless specifically stated, are taught in the foreign language. By the end of the first year, students attain mastery of the basic structure of the language and ability to converse on everyday topics as well as to read and write on an elementary level.

In the second year, emphasis is put on gradually raising the level of the student's ability to read and write. A third-year two-quarter sequential course stresses composition and introduction to literary analysis. Further, a course in phonetics perfects pronunciation and presents historical and dialect variants of Spanish. The introductory courses in literature, also in the third year, emphasize the analysis and appreciation of complete literary works by genre rather than the study of many short selections of innumerable authors in an anthology. The courses in Hispanic civilization combine a panoramic overview with a close look at a specific country or topic.

Although no major in Portuguese is offered, advanced literature courses are available. In addition, an undergraduate minor is offered.

Students are encouraged to participate in programs of study abroad during the summer and the junior year.

Elected representatives of the undergraduate majors, the graduate students, and the Teaching Assistants participate with full voting rights in Department meetings.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 138.

Departmental Requirements for the Major

Spanish 2C is a prerequisite to major requirements. Students are strongly advised to take Spanish 10A-B *before* the 101 series.

Core: Spanish 10A-B, 101A-B-C-D; Spanish 110A, B, or C; Spanish 113A. In addition, the student must choose one or more of the following emphases:

Literature and Culture: Seven upper-division courses in literature. Two courses in Hispanic culture and civilization may be substituted.

Linguistics: Linguistics 50, Spanish 113B plus any three selected from the following: Spanish 187; Spanish 200 or Linguistics 140; Spanish 201 or Linguistics 130; Spanish 205. Also, students must take two additional upper-division Spanish linguistics or linguistics courses. Students are encouraged to take the Spanish linguistics courses in their senior year. Students may double major in Spanish and Linguistics but may not count the same course for both majors.

Bilingualism and English as a Second Language: Spanish 100A; Spanish 100B or 115; Spanish 113B; Spanish 114; Spanish 133A or B; Spanish 134A or B; one upper-division literature course. In addition, students are required to take Spanish 110C of the core curriculum.

For students who plan to teach Spanish, the following courses are strongly recommended: Linguistics 50, Linguistics 140 (Second Language Acquisition), Spanish 113B (Spanish Linguistics). Also, Spanish 200 and Spanish 204 should be taken as seniors or as members of the credential program.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Spanish Minor

Seven courses in Spanish, including Spanish 10A and 10B and at least four upper-division courses. Prerequisite: Spanish 2C or equivalent.

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI.

Departmental Requirements for the Portuguese Minor

Prerequisite: Portuguese 1C or the equivalent. Requirements: Seven upper-division courses: Portuguese 140A-B, 141, 142, 143, 144, 145. (These are offered on a two-year cycle.)

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI.

Career Opportunities

Spanish is particularly useful in international business or trade, community or social service, and in the foreign service. Spanish majors interested in writing may look to publishing, writing, or editing positions.

Majoring in Spanish is excellent preparation for graduate and professional study in law, medicine, social welfare, library science, business or public administration, education, international relations, journalism, or advanced study in Spanish. An option available to Spanish majors is UCI's 3-2 Program offered by the Graduate School of Management, in which students may earn a Bachelor's degree in Spanish and a Master's degree in Management in five years rather than the usual six.

Bilingualism and English as a Second Language are very useful preliminary emphases for many of the fields described above. These areas are closely related to the teacher preparation program offered by the UCI Office of Teacher Education for students interested in the Bilingual/Cross-Cultural Emphasis credential.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Graduate Program in Spanish and Portuguese Master of Arts in Spanish

The candidate is expected to have the equivalent of the UCI undergraduate major. The student takes a minimum of 11 courses, eight of which must be at the graduate level. Two of the 11 courses must be in linguistics. Spanish 239A, *Methods of Literary Criticism*, is required of all literature majors. A maximum of two courses may be transferred from another university, but a maximum of five may be accepted from another University of California campus. Proficiency (defined as the equivalent of the level attained at the end of course 2C) in a foreign language other than the major language is required. The comprehensive examination, in part written, in part oral, will be based both on a reading list and the courses taken by the students and will also test the students' ability to express themselves correctly in Spanish. No thesis is required. The student may choose an emphasis in literature or linguistics. The M.A. requires a minimum of one year in academic residence and must be completed in no more than three years of graduate study. Normally only students who are studying for the Ph.D. are admitted to the graduate program. The comprehensive examination for the M.A. may be accepted as the written portion of the qualifying examination for the Ph.D.

M.A.T. in Spanish

This program is specifically directed at meeting the needs of working credentialed teachers, although others may apply. It seeks to provide a group of modern, relevant courses that will enable teachers to keep abreast of recent developments in their field. It is structured so that working teachers can take courses in late afternoons. Applicants should have a B.A. in Spanish and should acquire proficiency in a foreign language other than Spanish. The program consists of 10 courses (eight of which must be at the graduate level) as follows: three courses in Hispanic literature; three courses in Hispanic civilization; three courses in Hispanic linguistics; and one course in Recent Trends in Foreign Language Teaching, to be combined with a curricular research project or a thesis. M.A.T. students are counseled by a faculty member in the Department.

Bilingual/Cross-Cultural Emphasis

The bilingual/cross-cultural emphasis is a specialization in addition to the regular teaching credential for elementary school (Multiple Subject). Undergraduates may plan from the beginning to aim for this emphasis by choosing the track in Bilingualism and English as a Second Language. See page 307.

Ph.D. in Spanish

The Department of Spanish and Portuguese offers a Ph.D. degree with a minor in either Spanish or Spanish-American literature. The program attempts to integrate period and genre studies with work in literary theory, linguistics, and socio-historical studies. A number of courses outside of the Department are required. The Department thereby hopes to aid in the formation of Ph.D. candidates who are not narrow

specialists but rather scholars acquainted with the various fields that relate to their discipline. The Department is concerned also with the practical aspects of helping its graduates become good teachers.

The secondary field can be Spanish literature, Spanish-American literature, Chicano studies, Spanish linguistics, literary theory, comparative literature, or a non-Hispanic literature.

Language Requirements

A reading knowledge of Portuguese and two other languages relevant to the student's area of specialization is required. Advanced study in one of these languages may be offered in lieu of the reading knowledge of the other. The choice of languages requires Department approval.

Course Requirements

A minimum of 23 courses is required for the Ph.D. as follows:

- A. Two graduate courses in linguistics, diachronic and synchronic (the students who select Linguistics as a secondary field will substitute two courses in either Spanish or Spanish-American literature); Spanish 239A-B; a course on the socio-historical context of the period of the student's specialization; a course in Brazilian or Portuguese literature (preferably related to the student's specialization); two courses outside of the Department in non-Iberic literatures; two courses in Spanish or Spanish-American literature, whichever is not the major. Ph.D. candidates should take one course in each genre within their area.
- B. Additional courses for the major and the secondary field:
 1. Ten courses in the major, including one course on theory of the genre. Those students who major in twentieth-century Spanish-American literature are required to take Spanish 238A-B: Spanish-American Literature in the Colonial Period and in the Nineteenth Century.
 2. Three courses in the secondary field.

Candidates who have the M.A. degree from another university will be interviewed by two professors representing peninsular and Spanish-American literature, in order to evaluate their past studies in terms of our doctoral program; it is recommended that the student's graduate advisor direct the doctoral dissertation and that the choice of dissertation and director be made as early as possible. Each incoming graduate student will be assigned a faculty advisor who will supervise the student's program and with whom the student should meet at least once each quarter. All graduate students will be formally evaluated at the end of each year by the faculty with whom they have studied. Students pursuing a full-time program of study ordinarily should be able to earn the Ph.D. degree within six years or less.

Teaching

Since the overwhelming majority of Ph.D. candidates plan to teach, the Department recognizes its responsibility to train them as teachers. Therefore, all Ph.D. candidates without previous teaching experience are required to teach under supervision and at UCI one course in each of three quarters.

All Ph.D. students will student-teach in an upper-division course related to the major. This will count as one of the required courses in the major.

Comprehensive Examination

The student is admitted to candidacy by passing, by a majority vote, an oral examination administered by a Candidacy

Committee appointed by the Graduate Council. The Candidacy Committee is composed of five members, of whom four will be from the Department. The oral examination will be preceded by a written examination as follows:

- A. The student, in consultation with the Doctoral Committee, may choose one of the following options:
 1. A comprehensive examination including a dissertation project. The student will then take parts 1, 2, and 3 of the examination described below, and will submit a dissertation project.
 2. A comprehensive examination including the minor instead of the dissertation project, part 4 of the examination described below.
- B. The written comprehensive examination will consist of three parts:
 1. A genre in all periods. The student will demonstrate knowledge of literary theory and methods of literary criticism.
 2. A historical literary period, including all of the genres and the socio-historical context.
 3. Textual analysis. A representative text in the student's genre of specialization will be given to the student at the time of the examination. If the genre is poetry, the text may be a complete poem or a section from a larger poem. In the case of the short story, novel, theatre, or essay, a relatively brief organic section will constitute the text. The student's analysis should be intrinsic; it should also demonstrate the relationship of the text to the total work as well as to the author's total production and the author's position in the literary history of the country or the continent.
 4. Dissertation project. During the year preceding the comprehensive exams, the student will write a dissertation project of approximately 40 typewritten (double-spaced) pages which will be turned in one month before the comprehensive exams. The topic as well as the dissertation advisor will be chosen by the student. The essay should:
 - a. Define clearly the topic of the dissertation and justify it by discussing its significance.
 - b. Discuss previous studies on this topic and prove the originality of the new study.
 - c. Describe and justify the critical method to be followed.
 - d. Include a bibliography of special, general, and theoretical works.

Dissertation

A dissertation topic will be chosen by the candidate and normally, but not necessarily, will fall within one of the major fields covered by the Qualifying Examination.

Three faculty members appointed by the Graduate Council will constitute the Doctoral Committee which supervises the preparation and completion of the doctoral dissertation. The Doctoral Committee supervises a final examination, the focus of which is the content of the dissertation. Ordinarily, the final examination will not be given after the dissertation is

completed, but rather at an appropriate point during its development. Such final examination normally will be given while the graduate student is in residence at UCI. The Doctoral Committee certifies that a completed dissertation is satisfactory through the signatures of the individual Committee members on the title page.

Courses in Portuguese

1A-B-C Fundamentals of Portuguese (4-4-4) F, W, S. Basic grammar, composition, and conversation with an initial exposure to Brazilian culture. (V)

140A-B Brazilian Prose Fiction (4-4) W, S. Selected study of Brazilian novels from the classical style of Machado de Assis to the regionalist novels of Linsdo Rego, G. Ramos, R. de Queiroz, J. Amado. Prerequisite: Portuguese 1C or equivalent.

141 Brazilian Civilization (4) F. History and culture of Brazil through sociological and literary works by contemporary authors. Prerequisite: Portuguese 1C or equivalent.

142 Brazilian Short Story (4). Nineteenth- and twentieth-century writers representing major literary trends: Machado, Mário Andrade, Lispector, and J. Veiga. Prerequisite: Portuguese 1C or equivalent.

143 Brazilian Poetry (4). Brazilian poets from the romantic period with emphasis on poets associated with Modernist Movement of 1922 and following poetic movements. Prerequisite: Portuguese 1C or equivalent.

144 Masterpieces of Portuguese Literature (4). The theatre of Gil Vicente, the epic of Camões, the realistic novel of Eça de Queiroz, and the modernist poetry of Fernando Pessoa. Prerequisite: Portuguese 1C or equivalent.

145 Brazilian Theatre (4). Contemporary plays with emphasis on the language and customs of the various cultural regions of Brazil. Prerequisite: Portuguese 1C or equivalent.

190 Individual Studies (4-4-4) F, W, S

290 Individual Study (4) F, W, S

Lower-Division Courses in Spanish

1A-B-C Fundamentals of Spanish (5-5-5), 1A (F, W), 1B (F, W, S), 1C (F, W, S). Natural approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced. Taught completely in Spanish.

S1A-B Fundamentals of Spanish (7.5-7.5) Summer. First year Spanish in an intensified form.

2A-B-C Intermediate Spanish (4-4-4), 2A (F, W), 2B (F, W, S), 2C (F, W, S). Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review in 2A. Prerequisite: Spanish 1C or equivalent. (V)

S2A-B Intermediate Spanish (6-6) Summer. Conversation, reading, and writing skills are developed using texts of literary and social interest. Prerequisite: Spanish 1C.

5 Spanish for Spanish Speakers (4) F. Workshop for writing concise compositions in Spanish with emphasis on contrastive features and interferences from English. Learning by doing approach to teaching of Spanish grammar, vocabulary, and orthography.

6 Spanish for Medical Personnel (4) S. Emphasizes medical terminology. Grammatical structures and vocabulary needed to interview and converse with Spanish-speaking patients. Prerequisite: one year of college-level Spanish or the equivalent.

10A-B Advanced Composition (4-4). Compositions on a variety of themes, motivated and prepared in the classroom and arranged in order of difficulty. Review of selected grammatical topics. Prerequisite: completion of Spanish 2C or equivalent.

15 Advanced Listening Skills (4). Increases student's ability to understand Spanish spoken in the media. Listening strategies; vocabulary preparation for listening activities; discussions of the content of listening activities. Prerequisites: Spanish 10B and consent of instructor.

30 Literature and Society (4). An interdisciplinary introduction to literature within the context of social and political history, focusing

on Spanish literature and society. Taught in English. Topics vary. Same as Humanities 30C. Not offered 1989-90. (IV)

50A-B-C The Individual and Society in Hispanic Literature (4-4-4). **50A-B:** Spanish works in translation; **50C:** Latin American and Chicano works. Taught in English. Not offered 1989-90. (IV)

Upper-Division Courses in Spanish

100A Theory and Practice of Bilingual Education (4). Theoretical and historical framework for bilingual education as practiced in the United States. Major theoretical research regarding bilingual education and language acquisition. Analysis of the historical context in which bilingual education is grounded in the United States. Examination of the various changes in government policy and perceptions. Prerequisite: Linguistics 50 or Social Sciences 3. Same as Linguistics 164.

100B Methods for Elementary Bilingual Teachers (4). Direct observation of bilingual classrooms in local elementary schools, classroom lectures, discussions, and presentations on the culture and language of the bilingual student. Same as Education 140A.

101A-B-C Introduction to Spanish Poetry, Drama, Prose Fiction (4-4-4) F, W, S. Analysis and interpretation of the outstanding works of Spanish literature. Concepts of literary history and theory. Prerequisite: Spanish 2C or equivalent.

101D Introduction to Latin American Literature (4). Analysis and interpretation of masterpieces of Latin American literature. Prerequisite: Spanish 2C or equivalent.

110A-B-C Hispanic Civilization (4-4-4) F, W, S. Each quarter focuses on a different country or topic. Content varies yearly. May be repeated for credit when topic changes. Prerequisite: Spanish 10B or equivalent.

113A Spanish Phonetics (4). Comparison of English and Spanish phonetics. Introduction to Spanish dialectology. Prerequisite: Spanish 2C or equivalent.

113B Introduction to Spanish Linguistics (4). Application of basic notions of linguistics to Spanish. Spanish phonology, morphology, syntax, and semantics. Special attention to the application of linguistics to the teaching of Spanish bilingualism. Linguistics 50 recommended.

114 Methods of Teaching English as a Second Language (4). Methods and materials for teaching English to speakers of Spanish. Includes methodology for teaching children, adolescents, and adults. Field experience required. Recommended: Linguistics 50 or Social Sciences 3 and Linguistics 140 or Social Sciences 142G. Same as Linguistics 160 and Education 140C.

115 Methods for Secondary Teachers of Spanish (4). Communicative approaches to teaching Spanish at the secondary school level. Theory and practice of oral proficiency acquisition techniques. Required field observations. Emphasis placed on training differences for native vs. nonnative Spanish speakers. Prerequisite: consent of instructor. Same as Education 140B.

117A, B, C Golden Age Literature (4-4-4). Golden Age literature in Spain including the Renaissance and Baroque periods. Works of poetry, narrative, and theater. Historical and cultural background. May be repeated for credit when topic changes.

119A, B, C Nineteenth-Century Spanish Literature (4-4-4). The main literary and ideological trends in nineteenth-century Spain, including romanticism, realism, and naturalism.

120A, B, C Twentieth-Century Spanish Literature (4-4-4). Twentieth-century Spanish authors. Works of poetry, narrative, and theater. Historical context of the period and principles of literary theory.

130A Spanish-American Prose Fiction 1830-1920 (4) F. Development of the novel and short story from Romanticism through Modernism.

130B Spanish-American Prose Fiction 1920-1950 (4) W. The search for a national identity in the context of European values and indigenous tradition. Criollismo, Surrealism, and Existentialism.

130C Spanish-American Prose Fiction 1950 to present (4) S. Magic Realism, the Fantastic, Self-Conscious Fiction. Mass media techniques, linguistic play. Borges, Rulfo, García, Márquez, Cortázar, Puig.

131A Spanish-American Poetry (4) F. The study of a particular movement, period, or theme, emphasizing poetry, e.g., modernismo, Vanguardismo, Post-Vanguardismo, or women's literature.

131B Spanish-American National Literature (4) W. The literature of specific countries with emphasis on the socio-historical contexts. Representative texts from all genres, including the essay.

131C Spanish-American Theatre (4) S. The twentieth-century Spanish-American theatre in one or more countries. Structured around movements, chronological periods, or themes.

133A-B Chicano Literature (4-4)

134 Chicano Culture (4). Current research and perspectives on different aspects of Chicano culture: political, economic, sociological, artistic, and folkloric. Topics may change from year to year. May be repeated once for credit when topic changes.

139 Writing about Literature (4). A course requiring at least 4,000 words of assigned English composition based on peninsular Spanish and/or Latin American texts in English translation. Several essays required. Topics vary. Spanish majors are given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor.

150 Spanish-American Literature in Translation (4). Recent Latin American fiction of Revolution and Escapism. Readings of Cotaízar, Borges, Fuentes, García Márquez, Juan Rulfo, and Desnoes. Taught in English.

160 Topics in Hispanic Film Studies (4). Study of the Spanish, Latin-American, or Chicano cinema from historical and stylistic perspectives. Sociological implications of the media and its relation to literature. Scenarios, cinematographic theories, films. May be repeated for credit when topic changes. In English. Same as Film Studies 160.

185 Selected Topics in Spanish Literature (4). Selection of representative topics in Spanish literature. May be repeated for credit when topic changes.

186 Selected Topics in Latin American Literature (4). Selection of representative topics in the history of Latin American literature. May be repeated for credit when topic changes.

187 Selected Topics in Spanish Linguistics (4). Major topics in Spanish linguistics. Emphasis on history of Castilian and major varieties of modern peninsular and American Spanish dialects. Judeo Spanish and Spanish-related creoles (papiamentu, palenquero) and their importance to history of standard Spanish. May be repeated for credit when topic changes.

190 Individual Study (4) F, W, S

Graduate Courses in Spanish

In addition to the following courses, graduate students might find these Humanities courses of special interest: Humanities 200 (The Nature and Theory of History); Humanities 210 (Approaches to Linguistic Study); Humanities 220 (Literary Theory); and Humanities 230 (Philosophical Analysis).

200 Second-Language Acquisition (4) F, S. A survey of the psycholinguistic research in language acquisition; children's first, second, and/or foreign language. Includes studies in contrastive analysis (Spanish-English) and error analysis in a variety of acquisition processes.

201 History of the Spanish Language (4) W. Diachronic survey of phonological changes from Latin to Old Spanish to Modern Spanish. Focuses on Castilian including Romance languages and other peninsular dialects for comparative purposes. Morphological changes.

202 Spanish in the United States (4) S. Focuses on sociolinguistic functions of the various social and stylistic varieties of Spanish in

the U.S. in spoken and written forms. Study of phonological, morphological, syntactical, and lexical differences and similarities with the standard Latin American and peninsular Spanish. Emphasis on recent work in Chicano discourse, and examination of relevant research on various dialects.

204 Recent Trends in Foreign Language Teaching (4). Recent theories and implications for language teaching. Topics include recent research in new methodologies of language acquisition. Review of linguistic research comparing various communicative trends including the cognitive code, the natural approach, the direct method, audiolingual, and most of the communicative and proficiency-oriented strategies of language teaching.

205 Spanish Dialectology (4) S. Phonological, morphological, and syntactic variations in Spanish as spoken in the Hispanic world, from synchronic and diachronic points of view. The study of Spanish as spoken in the United States.

210 Proseminar in Medieval Literature (4) S. Survey of Spanish Medieval literature covering main literary and cultural trends. Analysis of Spanish masterpieces including *Poemas del Mio Cid*, *Libro de Buen Amor*, and *Manrique's Coplas*.

214 Proseminar in Golden Age Literature (4) W. Survey of the major literary and cultural developments in sixteenth- and seventeenth-century Spain, such as the Italianate lyric, the pastoral, and the new narrative of the *novelas ejemplares*. Mysticism and the Counter Reformation, the concept of *honra*, the formation of a national theater, and the Baroque *desengaño*. Recommended for M.A. students.

215 Golden Age Prose Fiction (4) F. Examines major examples of Spanish Golden Age narrative: its genesis, development, and intertextuality. Analyzes the genre both as a literary phenomenon and as a critique of Spain's changing political and social conditions.

216 Golden Age Lyric Poetry (4) S. Critical analysis of major Spanish Golden Age lyric poets (Garcilaso, Luis de León, San Juan de la Cruz, Lope de Vega, Góngora, Quevedo) with an attempt to present a historical development of Spanish poetry and to relate this to larger sociohistorical forces.

217 Golden Age Theatre (4) F. Major *comedias* of the Golden Age. Prefaced by a brief survey of prior dramatic traditions in Spain. Includes Lope de Vega in the *comedia nacional*; social and religious drama and the *comedia capa y espada* (Ruiz de Alarcón, Tirso de Molina, Calderón).

219 Nineteenth-Century Spanish Literature (4) S. Romanticism. Realism. Naturalism and Generation of 1898. Lyric Poetry. Narrative and theater.

220 Modern Spanish Novel (4) W. Reading and discussion of representative works by twentieth-century Spanish novelists. Theory of the novel. Twentieth-century history of Spain.

221 Modern Spanish Poetry (4) S. Reading and discussion of the works of Spain's most significant twentieth-century poets. Includes theory of lyric poetry and modern history of Spain.

222 Modern Spanish Theatre (4) F. Reading and discussion of the works of Spain's most representative twentieth-century playwrights. Includes theory of theater and history of Spain.

223 Generation of 1898 (4) W. Analysis of the turn-of-the-century literature. Philosophical, historical, and cultural underpinnings of the changes in literature and art that took place at the time. Major authors: Unamuno, Valle Inclán, Machado.

224 The Spanish Essay (4) S. Study of the major thinkers of modern Spain, emphasizing their connections with European thought in particular. Works of Ortega y Gasset, Unamuno, Aranguren. Emphasis on the study of aesthetic ideas.

232 Spanish-American Short Story (4-4) S. Study of the Spanish-American short story, including its theory and history. Devoted to the works of a particular region or country. May be repeated for credit when geographical area changes.

233A-B-C Spanish-American Novel (4-4-4)

234 Spanish-American Poetry (4) S. Study of major Spanish-American poets and poetic trends. Poets include: Rubén Darío, Gabriela Mistral, Pablo Neruda, Jorge Luis Borges, César Vallejo, Octavio Paz, Ernesto Cardenal.

235 Spanish-American Essay (4) F. Main themes and problems related to Spanish-American search for national and cultural identity within the framework of contemporary thought. Readings include works by Mariátegui, A. Reyes, Paz, and Martínez Estrada.

236 Selected Topics in Hispanic Civilization (4) W. Topics vary. May be repeated for credit when topic changes.

237 Selected Topics in Chicano Literature (4) S. Explores the idea of minor literature as central to answering questions of language, fragmentation, decanonization, indeterminacy as posited in the Chicano novel.

238A Precolombian and Colonial Spanish-American Literature (4) S. Focuses on the literature produced during the colonial period (1521-1810) in Latin America. Examination of a few pre-Hispanic texts. Readings from the early chroniclers such as Díaz del Castillo, Garcilaso de la Vega, Ercilla y Zúñiga, and Sor Juana.

238B Nineteenth-Century Spanish-American Literature (4) W. Study of works by outstanding writers: Bello, Heredia, Sarmiento, Pombo, J. Hernández, R. Palma, J. Martí, Silva. Collateral readings in philosophical trends, literary history, social conditions, and criticism.

239 Methods of Literary Criticism (4) F. Literary studies and the social and philosophical view of the critic; the nature of literature and the mode of existence of a literary work; literary genres (definitions and distinctions); the problems of literary theory; intrinsic and sociological interpretation of literature. These theories are applied to Hispanic texts.

240A-B-C Literary Criticism, Theory of a Genre (4-4-4) W. The study of literary genres (novel, poetry, and theater) from the different theoretical perspectives developed during the twentieth century. The theories are applied to Hispanic texts.

241A-B-C Women's Literature in Spain and Spanish America (4-4-4) F, W, S

250 Mexican Corrido (4) F. Seminar. Study of the Mexican corrido or ballad with critical analysis of its historical development from the Spanish Romance period to the present. Structural forms and themes. Sociopolitical and cultural influences.

260 Seminar in Spanish (4) W. Topics vary. May be repeated for credit when topic changes.

270 Creative Writing Workshop in Spanish (2) F, W, S. Discussion of the theory and practice of creative writing. Critical analysis of the participants' work in progress. Guest writers.

290 Individual Study (4-4-4) F, W, S

291 Directed Reading (4-4-4) F, W, S

299 Dissertation Research (4-4-4) F, W, S

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

School of Physical Sciences

Harold W. Moore **Dean**

The School of Physical Sciences offers both professional training and general education in the Departments of Chemistry, Mathematics, and Physics. The faculty, active in research and graduate education, are at the same time vitally concerned with undergraduate teaching. Curricula of the School are designed to meet the needs of a wide variety of students ranging from those with little technical background who seek insight into the activities and accomplishments of physical scientists to those seeking a comprehensive understanding that will prepare them for creative research in physical science.

Over the course of the past century and a half, physics, chemistry, and mathematics have evolved into interdependent but separate intellectual disciplines. This development is reflected in the departmental structure of the School of Physical Sciences. In the same period, these fundamental disciplines have moved into domains of abstraction unimagined by early scientists. This trend to abstraction with its concomitant increase in understanding of the physical universe provides the major challenge to the student of the physical sciences. Mathematics, physics, and chemistry, while providing the foundation of the technology that dominates contemporary civilization, underlie to an ever-increasing extent the new developments in the biological and social sciences.

In recognition of the contribution students can make to the academic affairs of the School, a variety of responsibilities on School and departmental committees is given to undergraduate and graduate students.

Degrees

Chemistry	B.S., M.S., Ph.D.
Mathematics	B.S., M.S., Ph.D.
Physics	B.S., M.S., Ph.D.

Honors

Criteria used by the School of Physical Sciences in selecting candidates for honors at graduation are as follows: Approximately 1 percent will be awarded *summa cum laude*, 3 percent *magna cum laude*, and 8 percent *cum laude*. Honors are awarded on the basis of a student's performance in research and cumulative grade point average. The School of Physical Sciences also grants special honors to students who have distinguished themselves by their work in their major subject. A general criterion is that students must have completed at least 72 units in residence at a University of California campus.

Undergraduate Programs

Each department offers courses that are of value to nonmajors and majors in the sciences. The programs for majors are designed to meet the needs of students planning careers in business or industry, of students planning advanced professional study, and of students planning graduate work that continues their major interest. Introductory courses in chemistry, mathematics, and physics meet the needs of students majoring in the sciences, mathematics, and engineering and are also appropriate for students in other disciplines who seek a rigorous introduction to the physical sciences. In addition, a number of courses within the School have few or no prerequisites and are directed particularly toward students majoring in areas remote from the sciences.

Planning a Program of Study

Students who choose a major in the School of Physical Sciences have a variety of academic advising and counseling

resources available to them. In addition to faculty advisors, there is a Chief Academic Advisor in each department who is responsible for interpreting degree requirements, reviewing student petitions, and assisting with special advising problems. An academic advising and counseling staff, employed in the Associate Dean's Office, is available to serve a broad range of student advising needs. In consultation with their faculty advisor or an academic counselor, students should plan a course of study leading to a major in one of the departments of the School. In carrying out this major, students may often concentrate very heavily in a second department within the School or in some other school. Occasionally students choose to pursue a double major. Permission to do so may be sought by a petition submitted to the Office of the Associate Dean of Physical Sciences.

All initial courses of study for majors include mathematics through calculus, and calculus is a prerequisite for much of the upper-division work in each major. A student interested in any of the physical sciences should continue mathematical training beyond these prerequisite courses. Furthermore, students interested in either physics or chemistry usually will include work in both of these subjects in their undergraduate careers.

Students in the physical sciences are urged to acquire a working knowledge of computer programming at an early stage of their University studies. This can be accomplished by taking Information and Computer Science 21 or Engineering 10.

Career Opportunities

The majority of graduates continue their education beyond the Bachelor's degree level. Many pursue advanced academic degrees in preparation for careers in scientific or medical research, engineering, or postsecondary education. Some students enter professional school in areas such as medicine, dentistry, law, or business administration. Students who choose not to continue their studies beyond the baccalaureate level most frequently find employment in private business or industry. In addition to technical areas directly related to their major fields of study, students often enter careers in less obviously related fields such as computing, systems analysis, engineering, journalism, marketing, or sales.

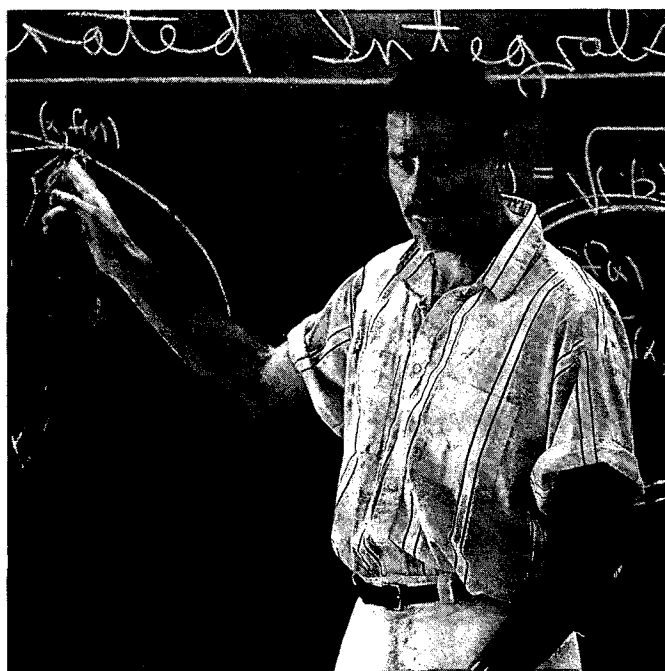
The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61 and 62.

3-2 Program

Chemistry, Physics, or Mathematics majors who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the Graduate School of Management section for further information.



Graduate and undergraduate programs in the Departments of Chemistry, Mathematics, and Physics provide students with access to a variety of research areas and foster close collaboration with faculty members such as Michael D. Fried, Professor of Mathematics, shown lecturing in a vector calculus course.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements

In addition to the courses taken in fulfillment of the UCI breadth requirement, students with a major in the School of Physical Sciences are required to take one additional approved three-course group chosen from one of the following breadth categories: Category III (Social and Behavioral Sciences); Category IV (Humanistic Inquiry); or the Language and Linguistics section of Category V. For purposes of this requirement, the approved sequences are the same ones listed for the UCI breadth requirement, with the exception that any three consecutive foreign language courses are acceptable. The lower-division courses in the minor in Global Peace and Conflict Studies (History 11, Physics 16, and Social Sciences 26D) also constitute an approved sequence for this requirement.

Graduate Programs

A program of course work and research leading to the M.S. and Ph.D. degrees is offered in each of the three departments of the School. The individual programs are described in the following announcements of each department.

Department of Chemistry

Faculty

Marjorie C. Caserio, Ph.D. Bryn Mawr College, *Chair of the Department and Professor of Chemistry* (organic reaction mechanisms)
 Fillmore Freeman, Ph.D. Michigan State University, *Vice Chair of the Department and Professor of Chemistry* (mechanistic and synthetic organic chemistry)
 Vartkess A. Apkarian, Ph.D. Northwestern University, *Assistant Professor of Chemistry* (chemical physics)
 Fraser A. Armstrong, Ph.D. University of Leeds, *Assistant Professor of Chemistry* (bioinorganic chemistry)
 Steven L. Bender, Ph.D. Harvard University, *Assistant Professor of Chemistry* (bioorganic, organic synthesis)
 David A. Brant, Ph.D. University of Wisconsin, *Professor of Chemistry* (physical chemistry of macromolecules)
 A. Richard Chamberlin, Ph.D. University of California, San Diego, *Associate Professor of Chemistry* (organic synthesis)
 Thomas A. Dix, Ph.D. Wayne State University, *Assistant Professor of Chemistry* (bioorganic chemistry and enzymology)
 Robert J. Doedens, Ph.D. University of Wisconsin, *Associate Dean of the School of Physical Sciences and Professor of Chemistry* (structural inorganic chemistry)
 William J. Evans, Ph.D. University of California, Los Angeles, *Professor of Chemistry* (synthetic inorganic and organometallic chemistry)
 Frank J. Feher, Ph.D. University of Rochester, *Assistant Professor of Chemistry* (organometallic and inorganic chemistry)
 R. Benny Gerber, Ph.D. Oxford University, *Visiting Professor of Chemistry* (theoretical chemistry)
 Vincent P. Guinn, Ph.D. Harvard University, *Professor Emeritus of Chemistry* (radiochemistry, activation analysis, forensic chemistry)
 Michelle M. Hanna, Ph.D. University of California, Davis, *Assistant Professor of Chemistry* (biological chemistry)
 Warren J. Hehre, Ph.D. Carnegie-Mellon University, *Professor of Chemistry* (theoretical, ion-molecule, organometallic chemistry)
 John C. Hemminger, Ph.D. Harvard University, *Professor of Chemistry* (surface chemistry and physics)
 Franklin A. Long, Ph.D. University of California, Berkeley, *Adjunct Professor of Chemistry* (science policy)
 Robert T. McIver, Jr., Ph.D. Stanford University, *Professor of Chemistry* (physical chemistry)
 George E. Miller, D. Phil. Oxford University, *Senior Lecturer in Chemistry and Reactor Supervisor* (radiochemistry and activation analysis)

Harold W. Moore, Ph.D. University of Illinois, *Dean of the School of Physical Sciences and Professor of Chemistry* (organic synthesis and rational drug design)
 Larry E. Overman, Ph.D. University of Wisconsin, *Professor of Chemistry* (organic synthesis)
 Peter M. Rentzepis, Ph.D. Cambridge University, *Professor of Chemistry and UCI Presidential Chair* (chemical kinetics, chemical and biological reaction intermediates, picosecond spectroscopy)
 Patricia A. Rogers, Ph.D. University of California, Irvine, *Lecturer in Chemistry* (chemical kinetics)
 F. Sherwood Rowland, Ph.D. University of Chicago, *Professor of Chemistry and Daniel G. Aldrich Chair* (chemical kinetics, atmospheric chemistry)
 A. J. Shaka, Ph.D. Oxford University, *Assistant Professor of Chemistry* (physical chemistry)
 Kenneth J. Shea, Ph.D. Pennsylvania State University, *Professor of Chemistry* (organic chemistry, polymer chemistry)
 Constance E. Suffredini, M.S. Lehigh University, *Lecturer in Chemistry*
 Mare Taagepera, Ph.D. University of Pennsylvania, *Lecturer in Chemistry* (substituent/solvent effects, acid/base chemistry)
 Robert W. Taft, Ph.D. Ohio State University, *Professor of Chemistry* (substituent/solvent effects, acid/base chemistry)
 James J. Valentini, Ph.D. University of California, Berkeley, *Professor of Chemistry* (laser spectroscopy, chemical physics)
 Max Wolfsberg, Ph.D. Washington University, *Professor of Chemistry* (theoretical chemistry)

Undergraduate Program

The major in Chemistry is elected by students planning careers in the chemical sciences and frequently also by those whose interests lie in biology, medicine, earth sciences, secondary education, business, and law. The curriculum of the Department is designed to satisfy the diverse needs of these students and others who may have occasion to study chemistry. The year course Chemistry 1A-B-C is prerequisite to all study in the Department at more advanced levels. The subject matter of this course serves also as a thorough introduction to the varied aspects of modern chemistry for students who do not wish to pursue their studies beyond this introductory level. Chemistry 51A-B-C is a one-year sequence in organic chemistry which is required for Chemistry majors and for students of the life sciences. Certain more advanced courses required of Chemistry majors may also be of interest to others.

The undergraduate program of the Chemistry Department emphasizes close contact with research. Chemistry majors are urged to engage in research or independent study under the direction of a faculty member.

Much of the important chemical literature is being and has been printed in foreign languages, principally German, Russian, and French. Reading competence in one or more of these languages is desirable, and many graduate schools require the demonstration of such competence as a prerequisite for an advanced degree. Chemistry majors are encouraged to acquire this competence.

Chemistry majors who are interested in teaching chemistry at the secondary level are urged to consult with their advisors and with the Office of Teacher Education early in their undergraduate careers. Chemistry majors who plan subsequent study in medical, dental, or other professional schools should request information concerning admission requirements directly from the schools which they seek to enter. Those intending to pursue graduate studies in chemistry should discuss their plans with an academic advisor.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 186.

Departmental Requirements

Basic Requirements: Mathematics 2A-B-C, Physics 5A-B-C and 5LB-LC, Chemistry 1A-B-C and 1LB-LC, Chemistry 51A-B-C and 51LA-LB-LC, Chemistry 107 and 107L, Chemistry 131A-B-C or 130 A-B-C, Chemistry 151.

Electives: Four courses chosen from the elective list below. These must include at least two courses offered by the Chemistry Department (Chemistry 180 may be counted no more than once, and Chemistry 139W, 192, 194, and 199 may not be counted) and at least one of the laboratory courses in the following laboratory course group: Chemistry 152, Chemistry 153, Chemistry 160, Chemistry 170, Physics 150, Physics 151, Physics 152, Physics 153.

Elective List: Chemistry 125, 135, and all Chemistry courses numbered 152-235, Biological Sciences 106 (Biochemistry), Biological Sciences 107 (Molecular Biology), Physics 111A-B (Classical Mechanics), Physics 112A-B (Electromagnetic Theory), Physics 113A-B-C (Quantum Physics), Physics 115 (Statistical Physics), Physics 116 (Thermodynamics), Physics 132 (Nuclear Physics), Physics 133 (Condensed Matter Physics), Physics 134 (Modern Optics), Physics 150 (Electronics for Scientists), Physics 151 (Advanced Laboratory), Physics 152 (Advanced Laboratory), Physics 153 (Advanced Laboratory).

Scientific Breadth Requirements: A total of six additional four- or five-unit courses chosen from the offerings of the Departments of Mathematics, Physics, Information and Computer Science, and the School of Biological Sciences. (These may be taken on a Pass/Not Pass basis subject to the usual restrictions on Pass/Not Pass enrollment.)

Planning a Program of Study

The departmental requirements leave the student a great deal of latitude in choice of courses; the student can choose to pursue interests ranging from biochemistry on the one hand to chemical physics on the other. Many of the basic requirements above coincide with those of the School of Biological Sciences. For this reason a double major in Chemistry and Biological Sciences does not require much extra course work. The Department is approved by the American Chemical Society to offer an undergraduate degree certified by the Society as suitable background for a career in chemistry or for graduate study in chemistry. While it is not mandatory, it

is desirable for students to pursue a course of study that the Department judges to merit a certified degree. Specifically, the following courses should be included in the program of study: two quarters in the Mathematics 3 series; Chemistry 152 and 153; Chemistry 160, 170, or 180. These courses must be taken for a letter grade.

Students should consult with their academic advisors on courses of study. A Chemistry major normally takes Chemistry 1A-B-C and 1LB-LC, Mathematics 2A-B-C, and required writing courses during the freshman year. The sophomore year should include Chemistry 51A-B-C and 51LA-LB-LC; the Physics 5A-B-C and 5LB-LC sequences should be completed no later than the fall quarter of the junior year. The balance of the freshman and sophomore program can be chosen at the student's discretion with consideration given to progress toward completion of the School of Physical Sciences breadth requirement, the UCI breadth requirement, and the Chemistry Department scientific breadth requirement. In the junior year all Chemistry majors should enroll in a year sequence of physical chemistry and in Chemistry 107 (fall) and 151 (winter). Chemistry 130A-B-C and 131A-B-C are parallel courses in physical chemistry; both are acceptable to satisfy the physical chemistry requirements for the major. Chemistry 130A-B-C, designed specifically for students with career interests in biochemistry, biophysics, physiology, and other basic life sciences, emphasizes applications of physical chemistry to liquid solutions, macromolecules, and other topics of biological relevance. During the junior and senior years the Chemistry Department electives requirement should be fulfilled, as should other University, School, and departmental requirements. There is no foreign language requirement, but Chemistry majors are urged to obtain reading competence in a foreign language through course work.

Outlines of several typical programs of study for Chemistry majors, American Chemical Society-certified Chemistry majors, and Chemistry-Biological Sciences or Chemistry-Physics double majors have been prepared. A sample program for the Chemistry major is shown below. Sample programs for students considering double majors or other specialized curricula are available.

Sample Program — Chemistry

This sample program is designed to meet the needs of students wishing to major in chemistry while retaining sufficient flexibility to allow for development of other interests. Students interested in pursuing the American Chemical Society certified degree, or a double major in Chemistry and Biological Sciences, are encouraged to seek advice about program planning from a counselor or faculty advisor early in their academic career.

	Freshman	Sophomore	Junior	Senior
Fall	Chemistry 1A Mathematics 2A English and Comparative Literature 39A Breadth	Chemistry 51A, 51LA Elective Breadth Science Breadth	Chemistry 130/131A Chemistry 107, 107L Physics 5C, 5LC Breadth	Upper-Division Chemistry Elective Upper-Division Writing Science Breadth Breadth/Elective
Winter	Chemistry 1B, 1LB Mathematics 2B English and Comparative Literature 39B Breadth	Chemistry 51B, 51LB Physics 5A Breadth Science Breadth	Chemistry 130/131B Chemistry 151 Breadth Breadth/Elective	Upper-Division Chemistry Elective Elective Science Breadth Breadth/Elective
Spring	Chemistry 1C, 1LC Mathematics 2C English and Comparative Literature 39C Breadth	Chemistry 51C, 51LC Physics 5B, 5LB Breadth Science Breadth	Chemistry 130/131C Upper-Division Chemistry Elective Breadth Breadth/Elective	Upper-Division Chemistry Elective Elective Science Breadth Elective

Graduate Program

The Department offers graduate programs leading to the M.S. and Ph.D. degrees in Chemistry. The Ph.D. degree is granted in recognition of breadth and depth of knowledge of the facts and theories of modern chemistry and an ability to carry out independent chemical research demonstrated through submission of an acceptable doctoral dissertation. The M.S. degree may be earned either through submission of an acceptable Master's thesis (Plan I) or through an approved program of graduate course work (Plan II). A Master's degree is not a prerequisite for admission to the Ph.D. program.

Upon entering the graduate programs, all students are required to take a series of Area Examinations which test the students' competence in the general areas of chemistry (e.g., organic, physical, inorganic) at the undergraduate level. The Area Examinations are designed to ensure a proper fundamental level of preparation for graduate study and are used as a guide in choosing the appropriate program of course work for each entering student.

Students in the Ph.D. program are expected to demonstrate their knowledge of chemistry at the advanced level through satisfactory completion of a series of Cumulative Examinations. These examinations are designed to encourage the independent study of chemistry through reading of the classic and current chemical literature and attendance at advanced seminars and colloquia. Normally, beginning with the second year of graduate study, students must take the monthly examinations until four have been passed. This requirement must be satisfied within 12 consecutive Cumulative Examinations.

Following completion of the Cumulative Examination requirement, participants in the Ph.D. program take an oral examination for formal Advancement to Candidacy. This examination normally comes in a student's third graduate year and consists of an oral defense before a faculty committee of the student's dissertation research project, and an original research proposition conceived, developed, and documented by the student. The committee may examine the student at this time on any subject it deems relevant to the independent pursuit of chemical research.

Students in the Ph.D. and M.S. Plan I (Thesis) programs are required to complete a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units), in chemistry. The M.S. Plan II (Course Work) program requires that the student complete 10 graduate-level chemistry courses (or 40 units). Graduate students are expected to attain grades of B or better to remain in good academic standing.

Training in teaching is an integral part of each graduate program, and all graduate degree candidates are expected to participate in the teaching program for at least four quarters during their graduate career.

The most important component of the Ph.D. program is the doctoral dissertation, which must describe the results of original research performed by the student under the supervision of a faculty member of the Department. The criterion for acceptability of the dissertation is that its contents be of a quality suitable for publication in a scientific journal of high editorial standards. Each Ph.D. candidate is expected to present the work described in the completed dissertation in a seminar before the Department, following which the candidate will be examined in public on the contents of the dissertation by a committee of the faculty. A Master's thesis presented in partial fulfillment of the requirements for the M.S. under Plan I must also describe the results of a student's

original research performed under the direction of a faculty member. However, no public oral defense of the Master's thesis is required.

Residency requirements specify a minimum of six quarters in residence at UCI for Ph.D. candidates and three quarters for M.S. candidates.

Some faculty from the Department of Chemistry are members of an interdisciplinary biophysics and biophysical chemistry group. The program provides an opportunity for interaction among graduate students and faculty from a number of UCI departments who share common interests in biophysics and biophysical chemistry. Participating graduate students pursue a degree in the department best suited to their own background and research interests. A program of seminars brings the group together to discuss research problems of mutual interest, and a regular series of interdisciplinary courses is offered by the participating faculty to provide formal instruction in areas encompassed by biophysics and biophysical chemistry. See page 95.

The following lists specify requirements for each of the graduate programs offered by the Department of Chemistry.

Master of Science in Chemistry Plan I (Thesis Plan)

Completion of the Area Examination requirement.

Completion of a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units) in chemistry (as specified by the Department and excluding Chemistry 280, 290, 291, and 399) with maintenance of an average grade of B or better in all course work undertaken.

Completion of the teaching requirement.

Completion of three quarters in residence at UCI.

Submission of an acceptable Master's thesis.

Master of Science in Chemistry Plan II (Course Work Plan)

Completion of the Area Examination requirement.

Completion of 10 graduate-level courses (or 40 units) in chemistry (excluding Chemistry 290, 291, and 399 and counting Chemistry 280 no more than once) with an average grade of B or better.

Maintenance of an average grade of B or better in all course work undertaken.

Completion of the teaching requirement.

Completion of three quarters in residence at UCI.

Doctor of Philosophy in Chemistry

Completion of the Area Examination requirement.

Completion of a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units) in chemistry (as specified by the Department and excluding Chemistry 280, 290, 291, and 399) with maintenance of an average grade of B or better in all course work undertaken.

Completion of the Cumulative Examination requirement.

Completion of the Oral Examination requirement for Advancement to Candidacy.

Completion of the teaching requirement.

Completion of six quarters in residence at UCI.

Submission of an acceptable doctoral dissertation.

Undergraduate Courses

NOTE: Enrollment in lower-division Chemistry courses may be subject to pre-testing or other limitations. See page 25 and the quarterly *Schedule of Classes* for information.

1A-B-C General Chemistry (4-3-3) F, W, S. Lecture, three hours; discussion, one hour. Stoichiometry, properties of gases, liquids, solids, and solutions; chemical equilibrium, chemical thermodynamics; atomic and molecular structure; chemical kinetics, periodic properties and descriptive chemistry of the elements. Prerequisites for Chemistry 1A: high school chemistry, three years of high school mathematics; high school physics is recommended. Corequisite for Chemistry 1A, 1B, and 1C: concurrent enrollment in the corresponding laboratory courses. Prerequisite for Chemistry 1B: passing grade in Chemistry 1A. Prerequisite for Chemistry 1C: passing grades in Chemistry 1B and 1LB. (II)

1LB-1LC General Chemistry Laboratory (2-2) W, S. Laboratory, four hours. Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics of Chemistry 1A-B-C. Corequisite for 1LB and 1LC: concurrent enrollment in the corresponding segment of Chemistry 1. Prerequisite for Chemistry 1LB: passing grade in Chemistry 1A. Prerequisite for Chemistry 1LC: passing grades in Chemistry 1B and 1LB. (II)

1LAE-1LBE General Chemistry Laboratory for Engineering Majors (1-2) F, W. Laboratory, four hours. Training and experience in basic laboratory experiments related to lecture topics in Chemistry 1A-1B. Corequisite for 1LAE and 1LBE: concurrent enrollment in the corresponding segment of Chemistry 1. Prerequisite for Chemistry 1LBE: passing grade in Chemistry 1A and 1LAE. Open to Engineering majors only. Chemistry 1LAE-1LBE satisfies all requirements which are met by Chemistry 1LB-1LC for non-Engineering majors. (II)

10 Preparatory Chemistry (4) S, Summer. Lecture, three hours; discussion, two hours. Preparation for introductory courses in chemistry. Topics include units and systems of measurement, conversion factors, significant figures, experimental error propagation, methods of problem solving, atomic and molecular structure, phase change, solutions, ionization, chemical reactions, stoichiometry, and oxidation-reduction. Not open to students who have received a grade of C- or better in Chemistry 1A. NOTE: This course satisfies no requirements other than contribution to the 180 units required for graduation.

51A-B-C Organic Chemistry (3-3-3) F, W, S. Lecture, three hours; discussion, one hour. Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and spectroscopic, physical, and chemical properties of the principal classes of carbon compounds. Corequisites for 51A-B: concurrent enrollment in the corresponding segment of Chemistry 51L. Prerequisites for 51A: Chemistry 1A-B-C and 1LB-1LC. Prerequisites for 51B: passing grades in Chemistry 51A and 51LA. Prerequisites for 51C: passing grades in Chemistry 51B and 51LB.

51LA-LB-LC Organic Chemistry Laboratory (2-2-2) F, W, S. Laboratory, four hours. Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in Chemistry 51A-B-C. Corequisites for 51LA-LB-LC: concurrent enrollment in the corresponding segment of Chemistry 51. Prerequisites for 51LB: passing grades in Chemistry 51A and 51LA. Prerequisites for 51LC: passing grades in Chemistry 51B and 51LB.

107 Inorganic Chemistry (3) F. Lecture, three hours; discussion, one hour. Introduction to modern inorganic chemistry. Principles of structure, bonding, and chemical reactivity with applications to compounds of the main group and transition elements. Organometallic and bioinorganic chemistry. Corequisite: concurrent enrollment in Chemistry 107L. Prerequisites: Chemistry 1A-B-C, 51A-B-C.

107L Inorganic Chemistry Laboratory (2) F. Laboratory, seven hours. Modern techniques of inorganic and organometallic chemistry including experience with glove box, Schlenk line, and vacuum line methods. Corequisite: concurrent enrollment in Chemistry 107. Prerequisites: Chemistry 51C and 51LC.

114 Science Education Teacher Apprentice Field Experience (4-4) F, W, S. Students assist public school classroom teachers in laboratory demonstrations and experiments, tutoring individuals or small groups. Same as Teacher Education 114. NOTE: this course satisfies no requirements other than contribution to the 180 units required for graduation.

125 Advanced Organic Chemistry (4) W. Lecture, three hours; discussion, one hour. Rapid-paced comprehensive treatment of organic chemistry, reinforcing the fundamental concepts introduced in the Chemistry 51A-B-C series. Focuses on molecular structure, reactivity, stability, and the scope and mechanisms of organic reactions. Topics include: structure and bonding; theoretical organic chemistry; acidity and basicity; reactive intermediates; pericyclic reactions; stereochemistry; organic synthesis; natural products; organic photochemistry. Prerequisites: Chemistry 51A-B-C.

130A-B-C Physical and Biophysical Chemistry. Lecture, three hours; discussion, one hour.

130A Chemical Thermodynamics (4). Classical thermodynamics of pure and multicomponent systems. Derivation of the criteria of chemical and heterogeneous equilibrium. Phase and chemical equilibrium and the properties of solutions. Membrane and multiple chemical equilibria in systems of biological interest. Corequisite: Physics 5C. Prerequisites: Chemistry 1A-B-C; Physics 5A-B; Mathematics 2A-B-C.

130B Quantum Chemistry and Spectroscopy (4). Fundamentals of molecular quantum mechanics. Development of the principles of rotational, vibrational, electronic, and magnetic resonance spectroscopy. Applications of luminescence, chiroptical, Raman, and magnetic resonance spectroscopy to biological structure determination. Prerequisite: Chemistry 130A.

130C Chemical Dynamics and Macromolecules (4). Kinetic theory and statistical mechanics of gases. Chemical kinetics and reaction mechanisms in the gas phase and in solution. Conformational and transport properties of macromolecules in solution. Scattering and diffraction. Prerequisite: Chemistry 130B.

131A-B-C Physical Chemistry. Lecture, three hours; discussion, one hour.

131A Chemical Thermodynamics (4). Chemical thermodynamics of pure and multicomponent systems in the solid, liquid, and gaseous states. Development of conditions of chemical and heterogeneous equilibrium with applications to systems of chemical interest. Corequisite: Physics 5C. Prerequisites: Chemistry 1A-B-C, Physics 5A-B, Mathematics 2A-B-C.

131B Quantum Chemistry (4). Principles of quantum mechanics with application to the elements of atomic structure and energy levels, diatomic molecular spectroscopy determination, and chemical bonding in simple molecules. Prerequisite: Chemistry 131A.

131C Statistical Mechanics and Chemical Dynamics (4). Development of the relationship between the quantum mechanical properties of individual molecules and the thermodynamic properties of macroscopic collections of molecules. Kinetic theory and transport processes. Rates and mechanisms of chemical reactions. Prerequisite: Chemistry 131B.

135 Methods of Molecular Structure Determination (4). Lecture, three hours; discussion, one hour. Prerequisites: Chemistry 131A-B-C or 130A-B-C. Determination of molecular structure using spectroscopic, diffraction, and scattering techniques.

139 Technical Writing and Communication Skills (4) F,W,S. Lecture, four hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisites: upper-division standing; satisfaction of the lower-division writing requirement. Open to Chemistry majors only. Same as Mathematics 139 and Physics 139.

151 Quantitative Analytical Chemistry (5) W. Lecture, three hours; discussion, one hour; laboratory, six hours. Theoretical and practical aspects of important methods in analytical chemistry with laboratory analyses of standard samples. Topics include statistical treatment of data, gravimetry, titrimetry, chromatography and other separation methods, spectrochemical and electrochemical measurements. The use of simple computer programs for data reduction is encouraged. Prerequisites: Chemistry 1A-B-C, 1LB-LC, 51A-B-C, and 51LA-LB-LC.

152 Advanced Analytical Chemistry (4) F. Lecture, three hours; discussion, one hour; laboratory, six hours. In-depth treatment of most modern instrumental methods for quantitative analysis of real samples and basic principles of instrument design. Laboratory experiments in the use of electronic test equipment, microprocessor programming, interfacing and use of techniques such as absorption, emission, and luminescence spectrophotometry, polarography, gas and liquid chromatography, magnetic resonance, neutron activation analysis, and mass spectrometry. Prerequisite: Chemistry 151.

153 Physical Chemistry Laboratory (4) S. Prelaboratory discussion, one hour; laboratory, nine hours. Laboratory exercises emphasize quantitative characterization of chemical substances and chemical processes. Experiments in chemical thermodynamics, atomic and molecular spectroscopy, chemical kinetics, and various methods of molecular structure determination. Prerequisites: Chemistry 151 and Chemistry 130C or 131C (may be taken concurrently).

160 Qualitative Organic Analysis (4) S. Lecture, two hours; laboratory, eight hours. Emphasizes modern spectral and chemical methods of identification of organic compounds. Prerequisites: Chemistry 51A-B-C, Chemistry 51LC.

170 Radioisotope Techniques (4) F. Lecture, three hours; laboratory, four to six hours. Basic theory and practice of production, separation, safe handling, counting, applications of radioactive isotopes with emphasis on applications in chemistry, biology, and medicine. Prerequisites: Chemistry 1A-B-C, 1LB-LC, 51A-B-C, and 51LA-LB-LC.

180 Undergraduate Research (4-4-4) F, W, S. The student wishing to engage in research for credit should arrange with a member of the staff to sponsor and supervise such work. A written report of the project is expected to be completed prior to the termination of Chemistry 180. Prerequisite: consent of a faculty sponsor.

192 Tutoring in Chemistry (1 to 4 per quarter) F, W, S. Students may enroll in a section of this course to earn course credit for tutoring associated with the Chemistry Peer Tutoring Program or for activities as a student assistant in a specific chemistry course. Admission to the course will depend upon demonstration of suitable qualifications and approval of the instructor in charge. Prerequisite: consent of instructor. Pass/Not Pass only. Note: No more than eight units earned in tutoring courses may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180 unit total.

194A-B Use of the Chemical Literature (2-2) S. Familiarization with bibliographic and dictionary sources of chemical information. Search strategies developed for the retrieval of chemical information by traditional and on-line computerized methods. Emphasis on the use of *Chemical Abstracts* and how to access both the printed and machine-readable data files. **194A:** organization and use of printed files. **194B:** use of on-line files. Prerequisite for 194B: 194A.

199 Independent Study in Chemistry (1 to 4 per quarter). The student wishing to pursue an independent study in a special topic should arrange with a member of the staff to sponsor and supervise such work. Prerequisite: consent of instructor.

Graduate Courses

201 Organic Reaction Mechanisms I (4) F. Lecture, three hours. Advanced treatment of basic principles of modern organic chemistry. Topics include molecular orbital theory, orbital symmetry control of organic reactions, aromaticity, carbonium ion chemistry, and free radical chemistry. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent.

202 Organic Reaction Mechanisms II (4) W. Lecture, three hours. Topics include the chemistry of carbenes and carbanions, conformational analysis, photochemistry, electrophilic substitutions, aromatic chemistry. Prerequisite: Chemistry 201.

203 Organic Spectroscopy (4) F. Lecture, three hours. Modern methods used in structure determination of organic molecules. Topics include mass spectrometry; ultraviolet, chiroptical, infrared, and nuclear magnetic resonance spectroscopy. Prerequisites: Chemistry 1A-B-C and 51A-B-C or equivalent.

204 Organic Synthesis I (4) W. Lecture, three hours. Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis is on carbon-carbon bond forming methodology. Topics include carbonyl annulations, cycloadditions, sigmatropic rearrangements, and organometallic methods. Corequisite: concurrent enrollment in Chemistry 202.

205 Organic Synthesis II (4) S. Lecture, three hours. Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis this quarter is on natural product total synthesis and retrosynthetic (antithetic) analysis. Prerequisite: Chemistry 204.

210 Theoretical Chemistry (4) F. Lecture, three hours. Review of basic quantum mechanics. Development of quantum mechanical models for molecular systems, and applications to the properties of organic, inorganic, and organometallic compounds. Use of orbital symmetry and related arguments for the prediction of molecular structure and reactivity. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent.

213 Chemical Kinetics (4) S. Lecture, three hours. Surveys gas phase and organic reaction mechanisms and their relationship to kinetic rate laws; treats the basic theory of elementary reaction rates. A brief presentation of modern cross-sectional kinetics is included. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent.

215 Inorganic Chemistry I (4) W. Lecture, three hours. Principles of modern inorganic chemistry with applications to chemical systems of current interest. Inorganic phenomena are organized into general patterns which rationalize observed structures, stabilities, and physical properties. Prerequisites: Chemistry 107 and 130A-B-C or 131A-B-C or equivalent.

216 Organometallic Chemistry (4) F. Lecture, three hours. Synthesis and reactivity of organometallic complexes with an emphasis on mechanisms. Topics include bonding and fluxional properties; metal-carbon single and multiple bonds; metal π -complexes. Applications to homogenous catalysis and organic synthesis are incorporated throughout the course. Prerequisite: Chemistry 107 or 215.

217 Physical Inorganic Chemistry (4) S. Lecture, three hours. General principles of the spectroscopy and magnetism of inorganic compounds. Characterization of inorganic complexes by infrared, near-infrared, visible, ultraviolet, NMR, EPR, EXAFS, and Mossbauer spectroscopies. Some necessary group theory developed. Prerequisite: Chemistry 215 or consent of instructor.

225 Polymer Chemistry (4) F. Lecture, three hours; discussion, one hour. Synthesis and reactions of polymers. Thermodynamics and kinetics of polymerization. Physical characterization of synthetic and natural macromolecules. Prerequisites: Chemistry 51A-B-C and Chemistry 130A-B-C or 131A-B-C or equivalent.

231A-B-C Quantum Chemistry and Spectroscopy. Lecture, three hours; discussion, one hour.

231A Time Independent Quantum Mechanics (4) F. Fundamentals of quantum mechanics. Applications of quantum mechanics to problems in atomic systems are considered. Prerequisites: Chemistry 131A-B-C or equivalent.

231B Time Dependent Quantum Mechanics (4) W. Formal development of time-dependent quantum mechanics. Approximation methods in time-dependent quantum mechanics. Classical and quantum scattering theory. Prerequisite: Chemistry 231A.

231C Molecular Spectroscopy (4) S. Theory and techniques of spectroscopy as used for the study of molecular properties. Conventional spectroscopic methods and coherent time-domain spectroscopies are covered. Prerequisite: Chemistry 231B.

232A Thermodynamics and Introduction to Statistical Mechanics (4) F. Lecture, three hours; discussion, one hour. A detailed discussion from an advanced point of view of the principles of thermodynamics, including thermometry and the three laws of thermodynamics. The fundamentals of statistical mechanics. Topics include an introduction to ensemble theory, Boltzmann statistics, and classical statistical mechanics. The statistical mechanics of ideal gas systems. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent.

232B Advanced Topics in Statistical Mechanics (4) W. Continued discussion of the principles of statistical mechanics. Applications to topics of chemical interest including imperfect gases, liquids, solutions, and crystals. Modern techniques such as the use of autocorrelation function methods. Prerequisite: Chemistry 232A or equivalent.

233 Nuclear and Radiochemistry (4). Lecture, three hours. Advanced treatment (beyond that in Chemistry 170) of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power. Prerequisite: Chemistry 170 or equivalent or consent of the Department.

234 Advanced Chemical Kinetics (4) W. Topics and format vary. Prerequisite: Chemistry 213 or consent of the Department.

235 Molecular Quantum Mechanics (4) W. Lecture, three hours; discussion, one hour. Application of quantum mechanics to calculation of molecular properties. Electronic structure of molecules. Prerequisite: Chemistry 231 or equivalent.

240 Forensic Chemistry (4). Lecture, three hours. The application of scientific methods, particularly various methods of analytical chemistry, to the field of crime investigation. Physical evidence, methods of examination and analysis, forensic interpretation of the results, and presentation of the results in court. Guest lecturers and illustrations from actual cases. Prerequisites: Chemistry 1A-B-C, 1LB-LC, 51A-B-C, and 51LA-LB-LC.

251 Special Topics in Organic Chemistry (1-4). Advanced topics in organic chemistry. Prerequisite: consent of the Department.

252 Special Topics in Physical Chemistry (1-4). Advanced topics in physical chemistry. Prerequisite: consent of the Department.

253 Special Topics in Inorganic Chemistry (1-4). Advanced topics in inorganic chemistry. Prerequisite: Chemistry 215 or consent of the Department.

261 Biomolecular Structure (4). Lecture, three hours. Inter- and intramolecular interactions which govern biomolecular structure and organization, and theory of cooperative binding and conformation change in biological systems. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent. Same as Physiology and Biophysics 261.

262 Biopolymers in Solution (4). Lecture, three hours. Electronic, chiroptical, and magnetic resonance spectroscopy as applied to studies of biological molecules and macromolecules. Theoretical and practical aspects of sedimentation equilibrium and transport in the study of biological macromolecules. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent. Same as Molecular Biology and Biochemistry 262 and Physiology and Biophysics 262.

264 Colloquium in Biophysical Chemistry (2) W. Colloquium, two hours. Presentations of research on topics in biophysics and biophysical chemistry. Faculty and invited speakers will address the fundamentals and background of physical approaches to biological problems and the experimental results obtained with them. Supplementary reading required. Same as Molecular Biology and Biochemistry 264 and Physiology and Biophysics 264.

280 Research (2 to 12) F, W, S. Organic synthesis, reaction kinetics, radiochemistry, nuclear chemistry, photochemistry, theoretical chemistry, physical organic chemistry, inorganic chemistry, physical chemistry of macromolecules. Prerequisite: consent of the Department.

290 Seminar (1-1-1) F, W, S. Weekly seminars and discussions on general and varied topics of current interest in chemistry. Prerequisite: graduate standing.

291 Research Seminar (4). Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable. Prerequisite: consent of instructor.

292 Organic Bioorganic Seminar (2) S. Students present public seminars on literature-based research topics in contemporary organic and bioorganic chemistry. Topics to be chosen by student and approved by instructor. Prerequisite: consent of instructor.

299 Independent Study (1-4) F, W, S. Prerequisite: consent of instructor.

399 University Teaching (4-4-4) F, W, S. Required of and limited to Teaching Assistants.

Department of Mathematics

Faculty

James J. Yeh, Ph.D. University of Minnesota, *Chair of the Department and Professor of Mathematics* (analysis)

Takeo Akasaki, Ph.D. University of California, Los Angeles, *Associate Professor of Mathematics* (ring theory)

Bruce M. Bennett, Ph.D. Columbia University, *Professor of Mathematics* (algebraic geometry)

Frank B. Cannonito, Ph.D. Adelphi University, *Professor of Mathematics* (group theory)

Rene A. Carmona, Ph.D. Université de Marseille, *Professor of Mathematics* (probability, mathematical physics)

William F. Donoghue, Jr., Ph.D. University of Wisconsin, *Professor of Mathematics* (classical function theory)

Paul C. Eklof, Ph.D. Cornell University, *Professor of Mathematics* (logic and algebra)

Mark Finkelstein, Ph.D. Stanford University, *Associate Professor of Mathematics* (recursive function theory)

Michael D. Fried, Ph.D. University of Michigan, *Professor of Mathematics* (arithmetic geometry)

Richard K. Jureg, Ph.D. University of Minnesota, *Professor of Mathematics* (differential equations)

Gerhard K. Kalisch, Ph.D. University of Chicago, *Professor Emeritus of Mathematics on Recall* (functional analysis)

Abel Klein, Ph.D. Massachusetts Institute of Technology, *Professor of Mathematics* (mathematical physics)

Meinhard E. Mayer, Ph.D. Parhon University (Rumania), *Professor of Mathematics and Physics* (mathematical physics)

George S. McCarty, Ph.D. University of California, Los Angeles, *Associate Professor of Mathematics* (algebraic topology)

Paul McGill, Ph.D. Queens University of Belfast, Northern Ireland, *Assistant Professor of Mathematics* (probability)

Huseyin A. Nesin, Ph.D. Yale University, *Assistant Professor of Mathematics* (algebra and logic)

David L. Rector, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Mathematics* (algebraic topology)

Robert C. Reilly, Ph.D. University of California, Berkeley, *Associate Professor of Mathematics* (differential geometry)

Bernard Russo, Ph.D. University of California, Los Angeles, *Professor of Mathematics* (functional analysis)

Martin Schechter, Ph.D. New York University, *Professor of Mathematics* (partial differential equations and functional analysis)

Stephen Scheinberg, Ph.D. Princeton University; M.D. University of California, Irvine, *Professor of Mathematics* (classical function theory)

Israel Michael Sigal, Ph.D. Tel-Aviv University, *Professor of Mathematics* (mathematical physics)

William H. Smoke, Ph.D. University of California, Berkeley, *Associate Professor of Mathematics* (homological algebra)

Kyryl Tintarev, Ph.D. Weizmann Institute, Israel, *Assistant Professor of Mathematics* (partial differential equations)

Edriss Titi, Ph.D. Indiana University, *Assistant Professor of Mathematics* (partial differential equations)

Howard G. Tucker, Ph.D. University of California, Berkeley, *Professor of Mathematics* (probability and statistics)

Robert W. West, Ph.D. University of Michigan, *Associate Professor of Mathematics* (algebraic topology)

Joel J. Westman, Ph.D. University of California, Los Angeles, *Associate Professor of Mathematics* (analysis)

Robert J. Whitley, Ph.D. New Mexico State University, *Professor of Mathematics* (analysis)

Janet L. Williams, Ph.D. Brandeis University, *Associate Professor of Mathematics* (probability and statistics)

The Department of Mathematics is engaged in teaching and fundamental research in a wide variety of basic mathematical disciplines, and offers undergraduate and graduate students the opportunity to fashion a thorough program of study leading to professional competence in mathematical research, or in an area of application.

The curriculum in mathematics includes opportunities for supervised individual study and research, and is augmented by seminars and colloquia. It is designed to be compatible with curricular structures at other collegiate institutions in California in order to enable students transferring to UCI to continue their programs of mathematics study.

Undergraduate Program

Undergraduate mathematics courses are of several kinds: courses preparatory to advanced work in mathematics, the exact sciences, and engineering; courses for students of the social and biological sciences; and courses for liberal arts students and those planning to enter the teaching field.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 186.

Departmental Requirements

Mathematics Major:

1. Mathematics 2A-B-C or H2A-B-C, 3A-B-C, 120, 121A-B, and 140A-B-C.
2. Computing skills attained through either Information and Computer Science 21 or Engineering E10.
3. Physics 5A-B-C or Chemistry 1A-B-C (also satisfies the breadth requirement in Category II).
4. Two additional courses selected from the following: Mathematics 3D, 13; Physics 5A-B-C-D-E; Chemistry 1A-B-C; Information and Computer Science 22, 23.
5. A three-course sequence in a single foreign language selected from the list given for Category V of the breadth requirement, with the exception that a first-level sequence is acceptable (e.g., German 1A-B-C or R1A-B-C). French, German, or Russian is recommended. (This will also satisfy the School's additional breadth requirement.)
6. Each Mathematics major must select, with the approval of the departmental undergraduate advisor, an area of specialization and complete additional requirements in it. The three specializations are in pure mathematics, applied mathematics, and mathematical statistics. The requirements for each are given below:

A. Mathematics Major with Specialization in Pure Mathematics

Nine upper-division or graduate-level courses selected from the following: Mathematics 111A-B-C, 122A-B-C, 130A-B-C, 141A-B, 142A-B-C, 144A-B, 145A-B-C, 146, 147A-B, 150A-B-C, 162A-B, 210A-B-C, 220A-B-C, and 230A-B-C.

B. Mathematics Major with Specialization in Applied Mathematics

Six upper-division courses selected from the following: Mathematics 105A-B-C, 123A-B-C, 130A-B-C, 131A-B-C, 142A-B-C, 143A-B-C, 144A-B, 146, 150A-B-C, and 171A-B-C. Physics 110A-B-C may be used in place of Mathematics 143A-B-C, and Engineering EE 181A-B-C may be used in place of Mathematics 171A-B-C.

Three mutually related upper-division, one-quarter courses in some field of application. These three courses

may be chosen from the above list, or may be courses from another department approved in advance by the Mathematics Department.

C. Mathematics Major with Specialization in Mathematical Statistics

Mathematics 129A-B-C and 129LA-LB-LC and Mathematics 131A-B-C.

Three mutually related upper-division one-quarter courses in some field of application. These courses may be courses chosen from another department, in which case the courses must be approved in advance by the Mathematics Department, or they may be chosen from the following list of three-quarter sequences: Mathematics 105A-B-C, Mathematics 105A and Mathematics 128A-B, Mathematics 130A-B-C, Mathematics 171A-B-C, or Mathematics 201A-B-C.

Program Requirements for the Minor

The student must select one of three areas of specialization and complete the requirements in that area. The specializations and their corresponding requirements follow:

A. Mathematics Minor with Specialization in Mathematical Statistics

Mathematics 129A-B-C and 129LA-LB-LC and Mathematics 131A-B-C.

Two additional courses selected from Mathematics 128A-B and 130A.

B. Mathematics Minor with Specialization in Pure Mathematics

Mathematics 3A-B-C.

Seven courses selected from the following: Mathematics 13, 111A-B-C, 120, 121A-B, 122A-B-C, 130A-B-C, 140A-B-C, 141A-B, 142A-B-C, 144A-B, 146, 150A-B-C, and 162A-B. At least three of these courses must be selected from Mathematics 120, 121A-B, and 140A-B-C.

C. Mathematics Minor with Specialization in Applied Mathematics

Mathematics 3A-B-C or 6A-B-C.

Three courses selected from the following: Mathematics 120, 121A-B, 123A-B-C, 143A-B-C. Physics 110A-B-C may be substituted for Mathematics 143A-B-C.

Four additional courses selected from the immediately preceding list and/or from the following: Mathematics 3D, 105A-B-C, 130A-B-C, 131A-B-C, 140A-B-C, 142A-B-C, 144A-B, 146, 150A-B-C, and 171A-B-C.

Planning a Program of Study

There is a variety of career patterns the Irvine Mathematics major may select. In many instances, a double major (in Mathematics and an appropriate related field) provides the strongest preparation for the career desired.

Assistance in planning a program of study is available from faculty advisors and from the Chief Academic Advisor in the Mathematics Department.

Graduate Program

Graduate courses are designed to meet the needs of students doing graduate work in mathematics and in those disciplines that require graduate-level mathematics for their study. Among the fields covered are analysis, algebra, functional

analysis, geometry and topology, probability and statistics, ordinary and partial differential equations, and mathematical logic.

In addition to formal courses, there are seminars for advanced study toward the Ph.D. in various fields of mathematics. Topics will vary from year to year. Each seminar is conducted by a staff member specializing in the subject studied. Enrollment will be subject to the approval of the instructor in charge.

Master of Science in Mathematics

The Master's program serves a dual purpose. For some students it will be a terminal program of mathematics education; for others it will lead to study and research at the doctoral level. To earn the Master of Science degree, the student must satisfy course, language, and residency requirements, and pass a comprehensive examination administered by the Graduate Studies Committee of the Department.

Sample Program for the Mathematics Major Specializing in Pure Mathematics

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Elective Language Subject A or Breadth I	Math 3B Elective Physics 5C, 5LC Breadth III	Math 120 Math 122A Math 140A Breadth I*	Math 142A Math 150A Breadth IV Elective
Winter	Math 2B Physics 5A Language Breadth I	Math 3A Math 3C ICS 21 Breadth III	Math 121A Math 122B Math 140B Elective	Math 142B Math 150B Breadth IV Elective
Spring	Math 2C Math 13 Physics 5B, 5LB Language	Math 3D Elective ICS 22 Breadth III	Math 121B Math 122C Math 140C Elective	Math 142C Math 150C Breadth IV Elective

*Upper-division writing requirement.

Sample Program for the Mathematics Major Specializing in Applied Mathematics

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Elective Language Breadth I or Subject A	Math 3B Physics 5C, 5LC ICS 21 Breadth III	Math 120 Math 140A Applications course Breadth IV	Math 105A Math 143A Breadth I* Elective
Winter	Math 2B Physics 5A Language Breadth I	Math 3A Physics 5D, 5LD ICS 22 Breadth III	Math 121A Math 140B Applications course Breadth IV	Math 105B Math 143B Elective Elective
Spring	Math 2C Math 13 Physics 5B, 5LB Language	Math 3C Math 3D Physics 5E or ICS 23** Breadth III	Math 121B Math 140C Applications course Breadth IV	Math 105C Math 143C Elective Elective

*Upper-division writing requirement.

**Mathematics 6A is a prerequisite for ICS 23. Mathematics majors are encouraged, but not required, to meet this prerequisite.

Sample Program for the Mathematics Major Specializing in Mathematical Statistics

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Elective Language Breadth I or Subject A	Math 3B Elective Physics 5C, 5LC Breadth III	Math 129A, 129LA Math 140A Applications course Breadth IV	Math 120 Math 131A, 131LA Breadth I* Elective
Winter	Math 2B Physics 5A Language Breadth I	Math 3C Elective ICS 21 Breadth III	Math 129B, 129LB Math 140B Applications course Breadth IV	Math 121A Math 131B, 131LB Math 128A Elective
Spring	Math 2C Math 13 Physics 5B, 5LB Language	Math 3A Elective ICS 22 Breadth III	Math 129C, 129LC Math 140C Applications course Breadth IV	Math 121B Math 131C, 131LC Math 128B Elective

*Upper-division writing requirement.

There are three areas of concentration: Pure Mathematics, Applied Mathematics, and Applied Mathematical Statistics. Each concentration requires the satisfactory completion of 12 upper-division or graduate courses; this includes a core of nine courses (36 units), in each of which the student must earn a grade of B (3.0) or better, and three elective courses (9 to 12 units). At least eight of these courses must be at the graduate level (200-series courses). The specific requirements are described below. A grade point average of at least B (3.0) is required for all courses applicable to the M.S. degree. The student's selection of alternative or elective courses must be approved by the Graduate Studies Committee.

The nine required core courses for the Pure Mathematics concentration are Mathematics 210A-B-C, Mathematics 220A-B-C, and Mathematics 230A-B-C. The student must complete three additional approved courses.

The nine required core courses for the Applied Mathematics concentration are Mathematics 210A-B-C, Mathematics 220A-B-C and the A-B-C sequence of one of the following: Mathematics 201, 292, 295, or Physics 212. The student must complete three additional approved courses; these may be selected from the immediately preceding list.

The nine required core courses for the Applied Mathematical Statistics concentration are Mathematics 201A-B-C and 201LA-LB-LC, Mathematics 202 and 202L, Mathematics 204A-B and 204LA-LB, and either Mathematics 203A-B-C or Mathematics 210A-B-C.

Mathematics 199, 298, 299, and 399 may not be used to fulfill the course requirements for the Master's degree.

Ordinarily, the final examinations in the courses listed below will comprise the comprehensive examination for the Master's degree.

Pure Mathematics: Mathematics 210C, Mathematics 220C, and Mathematics 230C.

Applied Mathematics: Mathematics 210C, 220C, and the C part of the third one-year core course.

Applied Mathematical Statistics: Mathematics 201C, Mathematics 202, and Mathematics 204B.

Students must satisfy the language requirement for the Master's degree by demonstrating reading proficiency in French, German, or Russian. Proficiency in a higher level programming language may be substituted for French, German, or Russian only for the Master's degree with concentration in applied mathematical statistics.

The residency requirement for the Master's degree ordinarily is satisfied by full-time enrollment for three quarters immediately preceding the award of the M.S. degree. When appropriate, a leave of absence may be granted between matriculation and the final quarters of study.

Ph.D. in Mathematics

To be admitted to the doctoral program in Mathematics, an applicant normally must have completed a Master's degree in Mathematics with distinction. Under certain circumstances, where there is evidence of deficiencies in preparation, applicants may be required to provide further evidence of the ability to succeed in the Ph.D. program, by performing well, for example, in one or more of the specified comprehensive examinations.

When accepted into the doctoral program, the student embarks on a program of formal courses, seminars, and individual study courses to prepare for the Ph.D. qualifying examination and dissertation.

After an appropriate period of advanced study, the Graduate Studies Committee will invite the student to prepare for the qualifying examination (or recommend that the student withdraw from the program). This decision will be reached after consultation with the student's faculty advisor and a review of the instructors' evaluations of the student's performance in courses and seminars.

The departmental requirements for advancement to candidacy for the Ph.D. degree are: satisfactory performance in Mathematics 210A-B-C, 220A-B-C, 230A-B-C (which can be taken as part of the Master's program) or the equivalent; satisfactory performance at the post-Master's level in three approved year-long graduate courses (nine one-quarter courses) which must exclude Mathematics 201, 202, 204, 210, 220, 230, 298, 299, or 399; satisfactory performance in two language examinations (French, German, or Russian); and satisfactory performance in the oral qualifying examination.

The oral qualifying examination is conducted by a candidacy committee, appointed by the Dean of Graduate Studies and Research on behalf of the Graduate Council, including at least one member of the faculty outside of the Mathematics Department.

After the student meets the requirements, the Graduate Studies Committee recommends to the Dean of Graduate Studies the advancement to candidacy for the Ph.D. degree.

Teaching experience and training is an integral part of the Ph.D. program. All doctoral students are expected to participate in the teaching program of the Department.

The candidate must demonstrate independent, creative research in mathematics by writing and defending a dissertation that makes a new and valuable contribution to mathematics in the candidate's area of concentration. Following advancement to candidacy, a doctoral committee, appointed by the Dean of Graduate Studies on behalf of the Graduate Council, guides and supervises the candidate's research, study, and writing of the dissertation; conducts an oral defense of the dissertation; and recommends that the Ph.D. be conferred upon approval of the doctoral dissertation.

Lower-Division Courses

1 Pre-Calculus Mathematics (4) F, W, S, Summer. Lecture, two hours; laboratory, two hours. Prepares student for calculus and other mathematics courses. Inequalities, exponentials, logarithms, trigonometry, elementary analytic geometry, and systems of simultaneous equations. Offered on a self-paced basis, Pass/Not Pass only. Satisfies no requirements other than contribution to the 180 units required for graduation.

1A-B Pre-Calculus. Lecture, three hours; discussion, two hours. Mathematics 1A and 1B are equivalent to Mathematics 1 and may not be taken if the student has passed Mathematics 1.

1A (0) F,W. Basic equations and inequalities, linear and quadratic functions, and systems of simultaneous equations. Workload credit only.

1B (4) W,S. Preparation for calculus and other mathematics courses. Exponentials, logarithms, trigonometry, polynomials, and rational functions. Satisfies no requirements other than contribution to the 180 units required for graduation. Prerequisite: Mathematics 1A or consent of instructor.

2A-B-C Calculus. Lecture, three hours; quiz, two hours. Prerequisite: Mathematics 1 or a score of at least 3 on the Advanced Placement Examination in calculus. Waiver of prerequisites: at certain times throughout the year, the Mathematics Department will offer an examination for those who wish to waive the Mathematics 1 prerequisite. Examination must be passed within one year prior to enrolling in Mathematics 2A. In addition, waiver of prerequisites may be granted by consent of instructor.

2A (4) F, W, S, Summer. Introduction to derivatives, calculation of derivatives of algebraic functions, and applications of derivatives (approximations, curve plotting, related rates, maxima and minima). Indefinite integrals. Differentiation and integration of sines and cosines. (V)

2B (4) F, W, S, Summer. Definite integrals, their applications (areas, volumes, etc.), and methods of integration. Logarithmic and exponential functions. (V)

2C (4) F, W, S, Summer. Analytic geometry and Polar coordinates. Multiple integrals. Infinite sequences and series, Taylor series. (V)

3A Introduction to Linear Algebra (4) F, W, S. Lecture, three hours; quiz, two hours. Vectors, matrices, linear transformations, dot products, determinants, systems of linear equations, vector spaces, subspaces, dimension. Prerequisites: Mathematics 2A-B-C. Note: It is suggested that students take Mathematics 3B before Mathematics 3A.

3B-C Vector Calculus. Lecture, three hours; quiz, two hours.

3B (4) F, W, Summer. Differential and integral calculus of real-valued functions of several real variables, including applications and preliminary geometry. Prerequisites: Mathematics 2A-B-C.

3C (4) W, S. The differential and integral calculus of vector-valued functions; line and surface integrals; divergence and curl; theorems of Green, Gauss, and Stokes. Prerequisite: Mathematics 3B.

3D Elementary Differential Equations (4) W, S. Lecture, three hours; quiz, two hours. Linear differential equations, variation of parameters, constant coefficient cookbook, systems of equations, Laplace transforms, series solutions. Prerequisite: Mathematics 3A.

6 Discrete Mathematics. Lecture, three hours; quiz, two hours. The three quarters are independent of each other and may be taken in any order. Prerequisite: high school mathematics through trigonometry. Designed for Information and Computer Science majors; students are expected to have a strong mathematical background.

6A Combinatorics (4) F. Basic counting methods, binomial coefficients, graph theory, generating functions, recurrence relations, inclusion-exclusion, Polya's formula (V)

6B Boolean Algebra and Logic (4) W. Boolean algebra, finite state machines, formal languages, formal logic. (V)

6C Linear Algebra (4) S. Linear equations, vector spaces and subspaces, linear functions and matrices, linear codes, determinants, scalar product. (V)

7 Basic Statistics (4) F, W, S, Summer. Lecture, three hours; quiz, two hours. Basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits. (V)

13 Introduction to Abstract Mathematics (4) F, W, S, Summer. Lecture, three hours. The style of precise definition and rigorous proof which is characteristic of modern mathematics. Topics include set theory, equivalence relations, proof by mathematical induction, and number theory. Students construct original proofs to statements. Strongly recommended for freshman and sophomore Mathematics majors as preparation for upper-division courses such as Mathematics 120 and 140. (V)

Upper-Division Courses

NOTE: Some of the upper-division courses listed below have one or two hours of discussion weekly in addition to the lectures. Students should refer to the quarterly *Schedule of Classes* for specific information.

105A-B-C Numerical Analysis (4-4-4) F, W, S. Lecture, three hours. Introduction to methods, pitfalls, applications of practical numerical

computation; discussion of accuracy, stability, and efficiency of several standard numerical methods; function approximation, solution of polynomial equations, linear systems of algebraic equations, the algebraic eigenvalue problem; interpolation, quadrature, initial and boundary value problems, fast Fourier transform. Prerequisites: Mathematics 2A-B-C and some acquaintance with the elements of linear algebra, differential equations, Fourier series, and computer programming. Corequisite: concurrent enrollment in 105LA-LB-LC, when offered.

105LA-LB-LC Numerical Analysis Laboratory (2-2-2) F, W, S. Laboratory, one hour plus computer projects. Illustration of numerical algorithms, analysis of data to infer behavior of mathematical systems, programming in FORTRAN, use of a numerical software package. Corequisite: concurrent enrollment in Mathematics 105. Prerequisite: programming experience in a higher level language. Offered at discretion of instructor of Mathematics 105.

111A-B-C Projective Geometry (4-4-4) F, W, S. Lecture, three hours. Elementary plane projective geometry. Axioms, the real projective plane, finite geometries, Desargues' theorem, Pappus and Pascal theorems, coordinate systems.

120 Introduction to Abstract Algebra (4) F. Lecture, three hours. Introduction to groups, rings, and fields with a detailed look at permutation groups, congruence classes of integers, modulo n , and polynomials. Students are expected to do original proofs. Corequisite: Mathematics 3A. Mathematics 13 is strongly recommended.

121A-B Linear Algebra (4-4) W, S. Lecture, three hours. Theory of vector spaces, linear functions and their matrix representation, determinants, similarity of matrices and corresponding canonical forms, inner products. Computational technique from Mathematics 3A will be assumed. Students are expected to do original proofs. Prerequisites: Mathematics 3A and 120, or consent of instructor. Mathematics 13 is strongly recommended.

122A-B-C Elementary Number Theory (4-4-4) F, W, S. Lecture, three hours. Primes, congruences, diophantine equations, quadratic reciprocity, and selected other topics. Prerequisite: one year of college mathematics.

123A-B-C Applied Modern Algebra (4-4-4) F, W, S. Lecture, three hours. Groups, symmetry groups, Polya enumeration; rings and fields, polynomial rings, coding theory; invariants of groups, generating functions. Prerequisite: Mathematics 3A or 6C. Note: Mathematics 120 may be substituted for Mathematics 123A in this sequence.

128A Mathematics of Finance (4) W. Lecture, three hours. Mathematical theory of interest: measurement of interest, accumulation and discount, equations of value, annuities and perpetuities, amortization and sinking funds, yield rates, bonds, depreciation, depletion. Topics covered are those included in the section on interest in the third actuarial examination. Prerequisites: Mathematics 2A-B-C.

128B Mathematical Foundations of Life Contingencies (4) S. Lecture, three hours. A rigorous mathematical development of single-life functions, multi-life functions, and multiple decrement functions. Mathematics 128A-B prepares the student for the fourth actuarial examination. Prerequisites: Mathematics 2A-B-C, 128A, and either Mathematics 129A or 131A.

129A-B-C Mathematical Theory of Sample Surveys (4-4-4) F, W, S. Lecture, three hours. Basic concepts of discrete probability, sample selection, stratification, cluster sampling, double-sampling procedures, optimal allocation, probability proportional to size sampling. Applications to problems in economics, business, public health, agriculture, and the social sciences. Corequisite: concurrent enrollment in 129LA-LB-LC. Prerequisites: Mathematics 2A-B-C.

129LA-LB-LC Sample Surveys Laboratory (1-1-1) F, W, S. Laboratory, two hours. Sampling from known populations for practical verification of the theory developed in Mathematics 129. Corequisite: concurrent enrollment in Mathematics 129.

130A-B-C Probability and Stochastic Processes (4-4-4) F, W, S. Lecture, three hours. Introductory course emphasizing applications. Discrete and continuous probability distributions. Distributions of sums and limit theorems. Markov chains and stochastic processes. Prerequisites: Mathematics 2A-B-C.

131A-B-C Mathematical Statistics (4-4-4) F, W, S. Lecture, three hours. Introduction to probability and mathematical statistics. Probability distributions. Expectation. Point estimation and confidence intervals. Fundamental theory of hypothesis testing. Applications. Corequisite: concurrent enrollment in 131LA-LB-LC, when offered. Prerequisites: Mathematics 2A-B-C.

131LA-LB-LC Mathematical Statistics Laboratory (1-1-1) F, W, S. Laboratory, two hours. Applications to concrete problems of the theory developed in Mathematics 131. Corequisite: concurrent enrollment in Mathematics 131.

139 Technical Writing and Communication Skills (4) F, W, S. Lecture, four hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisites: upper-division standing; satisfaction of the lower-division writing requirement. Open to Mathematics majors only. Same as Chemistry 139 and Physics 139.

140A-B-C Elementary Analysis (4-4-4) F, W, S. Lecture, three hours. Introduction to real analysis, including real number system, infinite series, sequences of functions, differentiation, integration, and elements of the calculus of scalar- and vector-valued functions of several variables. Students are expected to do proofs. Prerequisites: Mathematics 3A, 3B-C. Mathematics 13 is strongly recommended.

141A-B Introduction to Topology. Lecture, three hours. Strongly recommended for students planning to take graduate courses in mathematics.

141A Metric Spaces (4) W. Elements of naive set theory and the basic properties of metric spaces. Prerequisite: Mathematics 140A.

141B Point Set Topology (4) S. Introduction to topological spaces and topological properties. Prerequisite: Mathematics 141A or consent of instructor.

142A-B-C Differential Equations (4-4-4) F, W, S. Lecture, three hours. Introductory theoretical course in ordinary and/or partial differential equations. Existence and uniqueness of solutions, methods of solution, the geometry of solutions. Prerequisites: Mathematics 3A, 3B, and 3C or 3D, the latter being strongly recommended.

143A-B-C Methods of Mathematical Physics (4-4-4) F, W, S. Lecture, three hours. Introduction to applied mathematics, especially differential equations, for physical sciences and engineering students. **143A:** ordinary differential equations; methods of solution, applications, existence, uniqueness and stability, linear equations with constant and variable coefficients, and the Laplace transform. **143B:** series expansions; complex analysis; Fourier series; and introductory partial differential equations. **143C:** partial differential equations and their applications. Prerequisites: Mathematics 3A, 3B-C or consent of instructor. Same as Physics 110A-B-C.

144A-B Introduction to Complex Variables (4-4) W, S. Lecture, three hours. Complex numbers, analytic functions. Riemann mapping theorem with applications to boundary value problems. Theory of residues, power series expansions. Prerequisites: Mathematics 3A, 3B-C. Mathematics 140A is recommended.

145A-B-C Topics in Analysis (4-4-4) F, W, S. Lecture, three hours. Topics not usually covered in Mathematics 140A-B-C such as Fourier series, calculus of variations, operational calculus, integral equations. Prerequisites: Mathematics 140A-B-C.

146 Fourier Series (4) S. Lecture, three hours. Introduction to the theory of Fourier series and orthogonal expansions; applications to partial differential equations such as vibrating strings. Prerequisites: Mathematics 3A, 3B.

149A-B-C Math History for Mathematicians (4-4-4) F, W, S. Lecture, three hours. Broad survey of the evolution of mathematical concepts from ancient to modern times. Many mathematical exercises. Prerequisites: Mathematics 2A-B-C and three other mathematics courses, or consent of instructor.

150A-B-C Mathematical Logic (4-4-4) F, W, S. Lecture, three hours. Introductory course in mathematical logic. One quarter will cover set theory, including an axiomatic development, and cardinal and ordinal numbers. Two quarters will be concerned with logic and recursion theory, including effective procedures, propositional and predicate calculus, and incompleteness and undecidability. Prerequisite: consent of instructor.

162A-B Introduction to Differential Geometry (4-4) W, S. Lecture, three hours. Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space. Prerequisite: Mathematics 3A and 3B-C.

171A-B-C Mathematical Methods in Operations Research. Lecture, three hours. Prerequisite: consent of instructor. Same as Engineering EE181A-B-C.

171A Linear Programming (4) F, Summer. Simplex algorithm, duality, optimization in networks.

171B Nonlinear Programming (4) W. Conditions for optimality, quadratic and convex programming, geometric programming, search methods.

171C Integer and Dynamic Programming (4) S. Multistage decision models, applications.

175A-B-C Modern Mathematical Methods in Physics (4-4-4) F, W, S. Lecture, three hours. Introduction to manifold theory, dynamical systems, functional analysis, nonlinear analysis with the emphasis on effective tools rather than on an abstract framework. Applications to physics ranging from turbulence in fluid dynamics to instantons in field theory. No prior knowledge of these topics assumed. Prerequisite: Mathematics 3A, 3B. Mathematics 3C, 121A, and 140A-B-C recommended. Same as Mathematics 275A-B-C.

192 Tutoring in Mathematics (1 to 4 per quarter) F, W, S. Students may enroll in a section of this course to earn course credit for tutoring associated with the Physical Sciences Peer Tutoring Program or for activities as a student assistant in some specific mathematics course. Admission to the course depends on demonstration of suitable qualifications and approval of the instructor in charge. Prerequisite: consent of instructor. Pass/Not Pass only. NOTE: No more than eight units earned in tutoring courses may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180 unit total.

199A-B-C Special Studies in Mathematics (4-4-4) F, W, S. Supervised reading. For outstanding undergraduate mathematics majors in supervised but independent reading or research of mathematical topics. Prerequisite: consent of Department. Note: cannot normally be used to satisfy departmental requirements.

Graduate Courses

201A Theory of Mathematical Statistics (4) F. Lecture, three hours. Review of probability and sampling distributions. Point and interval estimation, sufficient statistics, hypothesis testing, analysis of categorical data, the multivariate normal distribution, sequential analysis. Prerequisites: Mathematics 131A-B-C, 120, and 121A-B or consent of instructor. Corequisite: concurrent enrollment in Mathematics 201LA.

201B Linear Regression Analysis (4) W. Lecture, three hours. The normal linear regression model, confidence ellipsoids for regression coefficient vectors, the F-test and its applications to one- and two-way analysis of variance, analysis of covariance and a test for independence, simultaneous confidence intervals. Prerequisite: Mathematics 201A. Corequisite: concurrent enrollment in Mathematics 201LB.

201C Experimental Design (4) S. Lecture, three hours. Analysis of variance for the linear regression and other models, Latin squares, incomplete blocks, nested designs, random effects model, randomization models, confounding. Prerequisite: Mathematics 201B. Corequisite: concurrent enrollment in Mathematics 201LC.

201LA-LB-LC Graduate Statistics Laboratory (2-2-2) F, W, S. Laboratory, two hours. Applications to concrete problems of the theory developed in Mathematics 201A, 201B, 201C. Oral and written reports, practice in professional consulting, development of statistical computing expertise. Corequisites: concurrent enrollment in corresponding segment of Mathematics 201A, 201B, 201C.

202 Nonparametric Statistical Inference (4) F. Lecture, three hours. Standard nonparametric tests for comparison of two or more treatments, tests for randomness and independence. Corequisites: Mathematics 201A and concurrent enrollment in 202L.

202L Nonparametric Statistics Laboratory (2) F. Laboratory, two hours. Applications to concrete problems of the theory developed in Mathematics 202. Oral and written reports, practice in professional consulting, development of statistical computing expertise. Corequisite: concurrent enrollment in Mathematics 202.

203A-B-C Topics in Mathematical Statistics (4-4-4) F, W, S. Lecture, three hours. Topics include survival analysis, risk theory, discriminant analysis, time-series analysis, statistical decision theory, or sequential analysis. Prerequisites: Mathematics 201A-B-C.

204A-B Multivariate Statistical Analysis (4-4) W, S. Lecture, three hours. The Wishart distribution, Hotelling's T^2 -test and its applications, growth curves, multivariate analysis of variance, discriminant analysis, principal components, and canonical correlations. Prerequisite: Mathematics 201A. Corequisites: Mathematics 201B and concurrent enrollment in 204LA-LB.

204LA-LB Multivariate Statistics Laboratory (2-2) W, S. Laboratory, two hours. Applications to concrete problems of the theory developed in Mathematics 204A-B. Oral and written reports, practice in professional consulting, development of statistical computing expertise. Corequisite: concurrent enrollment in corresponding segment of Mathematics 204A-B.

210A-B-C Real Analysis (4-4-4) F, W, S. Lecture, three hours. Measure theory, Lebesgue integral, L_p spaces. Radon-Nikodym theorem, differentiation, metric spaces, Banach spaces, Daniell integral. Prerequisites: Mathematics 140A-B-C or equivalent or consent of instructor.

211A-B-C Topics in Real Analysis (4-4-4). Lecture, three hours. A continuation of Mathematics 210A-B-C; topics selected by instructor.

216A-B-C Observer Theory (4-4-4) F, W, S. Lecture, three hours. A new theory of the observer providing a framework for the mathematical analysis of perception/cognition and of its relation to the physical world. Prerequisites: familiarity with mathematical analysis and abstract mathematical structures; consent of instructor. Same as Social Sciences 243G-H-I.

220A-B-C Analytic Function Theory (4-4-4) F, W, S. Lecture, three hours. Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping. Prerequisites: Mathematics 140A-B-C or equivalent or consent of instructor.

230A-B-C Algebra (4-4-4) F, W, S. Lecture, three hours. Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules. Prerequisites: Mathematics 120 and 121A-B or equivalent, or consent of instructor.

NOTE: Courses numbered 231 through 295 are not offered every year. In addition to the courses listed below, other courses are offered as interest and demand dictate.

234A-B-C Topics in Algebra (4-4-4). Lecture, three hours. Group theory, homological algebra, and other selected topics. Prerequisites: Mathematics 230A-B-C or consent of instructor.

240A-B-C Differential Geometry (4-4-4). Lecture, three hours. Differential manifolds, differential forms, integrations, introduction to Lie groups, connections, Riemannian manifolds, curvature and topology, calculus of variations in the large, immersions and imbeddings. Prerequisite: Mathematics 141A-B or consent of instructor.

250A-B-C Algebraic Topology (4-4-4). Lecture, three hours. Topics vary with instructor. Prerequisites: Mathematics 230A and 141A-B, or equivalent, or consent of instructor.

260A-B-C Functional Analysis (4-4-4). Lecture, three hours. Elements of Banach space theory, operator theory, Banach algebra theory including structure theory of commutative algebras and spectral

theory in Hilbert space. Prerequisites: Mathematics 210A-B-C and 220A-B-C or consent of instructor.

261A-B-C Operator Theory (4-4-4). Lecture, three hours. Elements of topological linear spaces, Hilbert spaces, spectral theorems and multiplicity theory, rings of operators, representation of groups and rings. Prerequisites: Mathematics 210A-B-C or consent of instructor.

268A-B-C Topics in Functional Analysis (4-4-4). Lecture, three hours. Selected topics such as spectral theory, abstract harmonic analysis, Banach algebras, operator algebras. Prerequisite: consent of instructor.

270A-B-C Probability (4-4-4). Lecture, three hours. Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes. Prerequisites: Mathematics 130A-B-C and 210A-B-C or consent of instructor.

271A-B-C Stochastic Processes (4-4-4). Lecture, three hours. Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes. Prerequisites: Mathematics 210A-B-C or consent of instructor.

274A-B-C Topics in Probability (4-4-4). Lecture, three hours. Prerequisites: Mathematics 270A-B-C or consent of instructor.

275A-B-C Modern Mathematical Methods in Physics (4-4-4) F, W, S. Lecture, three hours; discussion, one hour. Introduction to manifold theory, dynamical systems, functional analysis, nonlinear analysis with the emphasis on effective tools rather than on an abstract framework. Applications to physics ranging from turbulence in fluid dynamics to instantons in field theory. No prior knowledge of these topics assumed. Prerequisite: Mathematics 3A-B. Mathematics 3C, 121A, and 140A-B-C recommended. Same as Mathematics 175A-B-C.

280A-B-C Mathematical Logic (4-4-4). Lecture, three hours. Prerequisite: consent of instructor.

292A-B-C Applied Mathematics (4-4-4) F, W, S. Lecture, three hours. Mathematical techniques and methods applied to specific questions in physics, chemistry, and engineering. Background material in science and mathematics introduced as needed. Prerequisites: Mathematics 140A-B-C or consent of instructor. May be repeated for credit.

295A-B-C Partial Differential Equations (4-4-4). Lecture, three hours. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods. Prerequisites: Mathematics 210A-B-C or equivalent or consent of instructor.

298A-B-C Seminar (1 to 3) F, W, S. Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable. Prerequisite: consent of the Department. May be repeated for credit.

299A-B-C Supervised Reading and Research (2-12) F, W, S. May be repeated for credit.

399 University Teaching (1-4) F, W, S. Limited to Teaching Assistants. Does not satisfy any requirements for the Master's degree. Satisfactory/Unsatisfactory only. May be repeated for credit.

Department of Physics

Faculty

- Jonas Schultz, Ph.D. Columbia University, *Chair of the Department and Professor of Physics* (experimental particle physics)
 Minko Balkanski, Ph.D. Ecole Normale Supérieure, *Adjunct Professor of Physics*, (experimental condensed matter physics)
 Myron Bander, Ph.D. Columbia University, *Professor of Physics* (elementary particle theory)
 Gregory A. Benford, Ph.D. University of California, San Diego, *Professor of Physics* (plasma physics and astrophysics)
 Walter E. Bron, Ph.D. Columbia University, *Professor of Physics* (experimental condensed matter physics, laser science)
 Gary A. Chanan, Ph.D. University of California, Berkeley, *Associate Professor of Physics* (experimental astrophysics)

Amnon Fisher, Ph.D. Weizmann Institute (Israel), *Adjunct Professor of Physics* (experimental plasma physics)

Rognvald Garden, Ph.D. University of Edinburgh, *Assistant Professor of Physics* (experimental astrophysics)

Herbert Hamber, Ph.D. University of California, Santa Barbara, *Associate Professor of Physics* (elementary particle theory)

William W. Heidbrink, Ph.D. Princeton University, *Assistant Professor of Physics* (experimental plasma physics)

Herbert Hopster, Ph.D. University of Aachen (Federal Republic of Germany), *Associate Professor of Physics* (experimental surface physics)

Jon M. Lawrence, Ph.D. University of Rochester, *Professor of Physics* (experimental condensed matter physics)

Mark A. Mandelkern, Ph.D. University of California, Berkeley; M.D. University of Miami, *Professor of Physics* (experimental particle physics and medical physics)

Alexei A. Maradudin, Ph.D. University of Bristol, *Professor of Physics* (condensed matter theory)

Meinhard E. Mayer, Ph.D. Parhon University (Rumania), *Professor of Physics and Mathematics* (mathematical physics)

Roger D. McWilliams, Ph.D. Princeton University, *Associate Professor of Physics* (experimental plasma physics)

James E. Mercereau, Ph.D. California Institute of Technology, *Professor of Physics in Residence* (experimental condensed matter physics)

Douglas L. Mills, Ph.D. University of California, Berkeley, *Professor of Physics* (condensed matter theory)

William R. Molzon, Ph.D. University of Chicago, *Assistant Professor of Physics* (experimental particle physics)

Riley Newman, Ph.D. University of California, Berkeley, *Professor of Physics and Vice Chair of the Department* (experimental particle physics and gravitational physics)

Lewis Nosanow, Ph.D. University of Chicago, *Professor of Physics* (condensed matter theory)

William H. Parker, Ph.D. University of Pennsylvania, *Associate Executive Vice Chancellor and Professor of Physics* (experimental condensed matter physics)

Frederick Reines, Ph.D. New York University, *Distinguished Professor Emeritus of Physics* (experimental particle physics)

Amiram Ron, D.Sc. Technion—Israel Institute of Technology, *Adjunct Professor of Physics* (theoretical plasma and condensed matter physics)

Norman Rostoker, D.Sc. Carnegie Institute of Technology, *Professor of Physics* (plasma physics)

James E. Rutledge, Ph.D. University of Illinois, *Associate Professor of Physics* (experimental condensed matter physics)

Nathan Rynn, Ph.D. Stanford University, *Professor of Physics* (plasma physics)

Dalton Schnack, Jr., Ph.D. University of California, Davis, *Associate Adjunct Professor of Physics* (plasma physics)

Gordon L. Shaw, Ph.D. Cornell University, *Professor of Physics* (elementary particle theory)

Dennis J. Silverman, Ph.D. Stanford University, *Professor of Physics* (elementary particle theory)

Richard C. Slansky, Ph.D. University of California, Berkeley, *Adjunct Professor of Physics* (elementary particle theory)

Henry W. Sobel, Ph.D. Case Institute of Technology, *Professor of Physics in Residence* (experimental particle physics)

Robert C. Svoboda, Ph.D. University of Hawaii, *Assistant Adjunct Professor of Physics* (experimental particle physics)

Peter Taborek, Ph.D. California Institute of Technology, *Associate Professor of Physics* (experimental condensed matter physics)

Virginia L. Trimble, Ph.D. California Institute of Technology, *Professor of Physics* (theoretical astronomy) (on leave F)

Sukekatsu Ushioda, Ph.D. University of Pennsylvania, *Adjunct Professor of Physics* (experimental condensed matter physics)

Gerard Van Hoven, Ph.D. Stanford University, *Professor of Physics* (plasma physics and astrophysics)

Richard F. Wallis, Ph.D. Catholic University of America, *Professor of Physics* (condensed matter theory)

Gaurang B. Yodh, Ph.D. University of Chicago, *Professor of Physics* (experimental particle physics)

Physics is that branch of science concerned with the study of natural phenomena at the fundamental level. Physicists study

the smallest particles of matter (quarks and leptons), nuclei, and atoms; the fundamental forces; the properties of solids, liquids, gases, and plasmas; the behavior of matter on the grand scale in stars and galaxies; and even the origin and fate of the universe. Other disciplines such as chemistry, biology, medicine, and engineering often build upon the foundations laid by physics. In the past century applications of phenomena encountered in the field of physics have led to more changes in our lifestyle than have occurred in the previous millenium. These changes have brought us a "high" standard of living and a challenge to control these changes for the good of society. The knowledge gained in physical studies has affected our daily life, our view of life, our philosophies, and our religions. A subject of so great and general an influence is not only of interest to the specialist but should be understood in its scope, power, and promise for the future by every educated person.

The Department offers courses for students of various interests, from those in the liberal arts to those in engineering and other sciences. Faculty members are conducting active research in several forefront areas of physical research, and there is student access to specialized research areas such as elementary particles, plasma physics, astrophysics, and condensed matter at both advanced and undergraduate course levels. The faculty is vigorous, innovative, and engaged in everything from the traditional activities of research, education, and university service to community action, literature, and national policy making, to mention a few examples. The Department encourages student-faculty interaction. The Department consists of people committed to intellectual activities and is exciting to those who are so inclined.

Undergraduate Program

Courses in the Physics Department are designed to meet the needs of many kinds of students, from those students without facility in mathematics whose main interests lie in the humanities or the arts to those students with professional goals in science and engineering. The Physics major, concentrations in Applied Physics and Biomedical Physics, and a specialization in Astrophysics are offered. The three lower-division sequences in physics are distinguished by their intended audience, their mathematical prerequisites, and the extent to which they offer preparation for more advanced courses. These aspects of the beginning courses are summarized in the following table:

Physics 3	Physics 5	Physics 16-24
Intended Audience		
Premedical students, Biological Sciences majors	Physics, Chemistry, Mathematics, and Engineering majors	Nonscience majors
Prerequisites		
Algebra and trigonometry; concurrent enrollment in Math 2	Math 2A (Calculus); Physics 1 is recommended.	None
Preparation for Advanced Courses		
Physics 5C with permission	All upper-division courses in physics	None

Requirements for Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 186.

Departmental Requirements

Physics 5A-B-C-D-E with laboratory courses 5LB-LC-LD-LE; Physics 110A-B-C, 111A-B, 112A-B, 113A-B, and 115; two quarters of advanced laboratory (Physics 150-153); Mathematics 2A-B-C; Mathematics 3A-B-C; and three additional coherently related four-unit upper-division courses chosen from the Schools of Physical Sciences, Biological Sciences, Engineering, or the Department of Information and Computer Science. Students who complete a program in Applied Physics, Biomedical Physics, or Astrophysics fulfill this requirement with course work taken in satisfaction of concentration or specialization requirements.

Requirements for the Concentration in Applied Physics

The requirements of the concentration in Applied Physics include all the requirements of the Physics degree *plus* six courses in engineering approved by the Physics Department. One quarter of the advanced laboratory requirement may be waived with appropriate engineering laboratory work.

Requirements for the Concentration in Biomedical Physics

The requirements of the concentration in Biomedical Physics include all the requirements of the Physics degree *plus* the following: Biological Sciences 101, 103, and 104 with associated laboratories; Chemistry 1A-B-C with laboratory; a three or four quarter sequence of courses in a specific area. Suggested sequences are as follows:

1. Chemistry 51A-B with laboratory; Biological Sciences 106 and 107
2. Biological Sciences 105 plus two Psychobiology courses
3. Chemistry 130A-B-C
4. Radiological Sciences 201A-B plus one additional Radiological Science course

Sequences other than those above may be acceptable; approval must be obtained in advance from the program coordinator.

Requirements for the Specialization in Astrophysics

The requirements of the specialization in Astrophysics include all the requirements of the Physics degree *plus* the three astrophysics courses (Physics 137, 144, 145) and any two of the four special topics courses (Physics 132, 134, 135, 136). Introductory course work in computer programming (ICS 21 or Engineering 10), Mathematics 3D, and Physics 20A or 20B is very strongly recommended during the freshman or sophomore years.

Planning a Program of Study

Physics 3 is a one-year course suitable for premedical students, students majoring in Biological Sciences, and non-science majors. It surveys most of the important branches of physics with strong orientation toward modern physics. Laboratory work accompanies the course. Nonscience majors with some mathematical skill may wish to consider Physics 3 as an alternative to Physics 16 through 24.

A student who decides to major in Physics after completing Physics 3 with a grade of A or B may, with the consent of the Department, enroll in Physics 5C. The premedical physics requirements may be met with Physics 3 or with Physics 5A-B-C.

Physics 1 is a preparatory course for the Physics 5 sequence and offers a review of math and problem-solving techniques

in the context of introducing physics. Although not required, Physics 1 is highly recommended for all students who lack strong high school preparation in physics and mathematics.

Physics 5 is an intensive five-quarter course for students in physics, chemistry, engineering, and other areas who are interested in a careful quantitative approach to the subject. Laboratory work accompanies the course. Students expecting to enroll in the entire five-quarter sequence of Physics 5 should enroll in Mathematics 3B concurrently with Physics 5C. Students planning to enroll in only three quarters of Physics 5 need not enroll in Mathematics 3B. Biological Sciences majors with facility in calculus should consider Physics 5 as an alternative to Physics 3.

Physics courses numbered between 16 and 24 are general education courses intended for nonscience majors. The content and format of Physics 21 through 24 will vary from year to year. In general, these courses will not include regular laboratory work.

Courses numbered 110 and above are for Physics majors and other qualified students. This series of courses in the upper-division curriculum is sufficiently broad to provide programs both for the Physics major who does not intend to pursue the study of physics beyond the Bachelor's degree level and for the Physics major preparing for a professional career in physics. Courses numbered between 110 and 116 emphasize the mathematical and theoretical structures that have unified our understanding of nature. It should be noted that multi-quarter courses such as P113A-B-C must be taken and passed in sequential order. Courses numbered between 130 and 149 emphasize particular domains of the structure of matter. The Physics major with a career goal, for example, in medicine, law, teaching, or business should emphasize the Physics 130 series, which covers most of the important phenomena of physics. Any Physics major who is so inclined may take more than the minimum two quarters of advanced laboratory work. Laboratory work is assigned to separate courses, numbered 150 to 153.

Transfer students are specifically advised to seek individual consultation with a member of the Physics faculty before deciding on a program of courses.

Since many graduate physics departments require a reading knowledge of one foreign language, Physics majors planning graduate work should, if possible, study some Russian, German, or French. Introductory courses in biology and chemistry are also recommended options. Every Physics major should avoid overspecialization and wisely use undergraduate years to explore some areas remote from physics.

Note also that alternatives to Physics major requirements can be approved upon petition to the Department and the Office of the Associate Dean. For example, exceptionally prepared students and/or Mathematics-Physics double majors may be allowed to substitute certain mathematics courses (Mathematics 140A-B-C, 142A-B-C, 144A-B) for Physics 110. Furthermore, exceptionally prepared students are allowed to enroll in graduate-level courses; to do so requires the approval of the Physics Department Undergraduate Committee.

As a guide to preparing a suitable program, the Department makes the following suggestions:

Physics majors considering the possibility of graduate school in engineering should complete the Applied Physics requirements.

The course program of Physics majors considering graduate work in chemistry, biology, or various interdisciplinary areas should contain:

Chemistry 1A-B-C and 51A-B-C, and Biological Sciences 101, 103, and 104.

The concentration in Biomedical Physics is offered for Physics majors who wish to follow an integrated program which combines biology and/or chemistry with physics, and is suitable preparation for a graduate career in one of these interdisciplinary areas.

The course program of Physics majors considering a teaching career in the public schools or the community colleges should contain:

Education 173 and 174, and additional preparation in some other area of science or mathematics. Courses from the Physics 16 through 24 sequence may be appropriate.

The course program of Physics majors considering graduate work in the history of science should contain at least:

History 29A-B-C. Courses from the Physics 16 through 24 sequence may be appropriate.

Sample Programs — Physics

A typical course program for Physics majors considering the possibility of graduate study in physics is shown below.

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Chem. 1A Physics 1 Elective	Math 3B Physics 5C, 5LC Elective Elective	Physics 110A Physics 111A Elective Elective	Physics 113A Physics 151 Physics 112B Elective
Winter	Math 2B Chem. 1B Physics 5A Elective	Math 3C Physics 5D, 5LD Elective Elective	Physics 110B Physics 111B Physics 115 Elective	Physics Elective Physics 113B Elective Elective
Spring	Math 2C Chem. 1C Physics 5B, 5LB Elective	Math 3A Physics 5E, 5LE Elective Elective	Physics 110C Physics 112A Physics 116 Elective	Physics 153 Physics 113C Elective Elective

A typical course program for Physics majors in the Biomedical Physics concentration differs from the Physics major program in the sophomore, junior, and senior years.

	Sophomore	Junior	Senior
Fall	Physics 5C, 5LC Math 3B Bio. Sci. 101 Elective	Physics 110A Physics 111A Program elective Bio. Sci. 104, 104L	Physics 113A Physics 112B Elective Elective
Winter	Physics 5D, 5LD Math 3C Breadth Elective	Physics 110B Physics 111B Program elective Elective	Physics 113B Physics 152 Physics 115 Elective
Spring	Physics 5E, 5LE Math 3A Bio. Sci. 103, 103L Elective	Physics 110C Physics 112A Program elective Elective	Physics 113C Physics 153 Elective Elective

Sample Programs — Astrophysics

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Physics 1 Elective/breadth	Math 3B Physics 5C, 5LC ICS 21/Engineering 10 Elective/breadth	Physics 110A Physics 111A Physics 135 Elective/breadth	Physics 112B Physics 113A Physics 151 Elective/breadth
Winter	Math 2B Physics 5A Elective/breadth	Math 3A Physics 5D, 5LD Physics 20A/B Elective/breadth	Physics 110B Physics 111B Physics 144 Elective/breadth	Physics 115 Physics 113B Physics 134 or 136 Elective/breadth
Spring	Math 2C Physics 5B, 5LB Elective/breadth	Math 3C Physics 5E, 5LE Math 3D Elective/breadth	Physics 110C Physics 112A Physics 137 Elective/breadth	Physics 113C Physics 153 Physics 132 Elective/breadth

Sample Programs — Applied Physics

	Junior	Senior
Fall	Physics 110A Physics 111A Engr. EE113 Elective	Physics 113A Physics 112B Physics 151 Engr. EE114A
Winter	Physics 110B Physics 111B Engr. EE110A Elective	Physics 113B Physics 115 Engr. EE114B Engr. EE176
Spring	Physics 110C Physics 112A Engr. EE110B Elective	Physics 113C Physics 133 Elective Engr. EE178

Sample Program—Applied Physics

The Applied Physics concentration within the Physics undergraduate degree program is designed to provide appropriate education to students who anticipate a career in industrial or technological research. It combines the fundamental knowledge of physical processes obtained from physics courses with the technical knowledge obtained from engineering courses, particularly electrical engineering courses. In addition to the basic courses in physics, a student is required to complete six courses in the School of Engineering approved by the Physics Department. Examples of appropriate courses include Engineering EE75; EE110A, EE110B, EE113, EE114A, EE114B, EE176, EE178, ME120, ME135, and ME147. Upon completion of the Applied Physics concentration, the student will receive a B.S. degree in Physics.

A typical course program for Physics majors in the Applied Physics concentration differs from the Physics major program primarily in the junior and senior years. Engineering EE75 should be completed before the junior year.

Program Planning—Biomedical Physics

The Biomedical Physics concentration is designed for the student who anticipates a career in physics applied to biology and medicine, such as health physics or radiological physics, or who intends to work in a scholarly field which deals with the physical aspects of biology or medicine, such as molecular biology or physiology. Completion of requirements for the Physics major is required as are six quarters of basic courses in biology and chemistry (see table).

A sequence of three or four integrated additional courses which must be approved by the program coordinator completes the program. Students who wish to follow the Biomedical Physics concentration are advised to seek guidance early in their college careers. The requirements are such that coordination of a program in the first and second years is essential.

Program Planning—Astrophysics

The Astrophysics specialization is primarily for students planning graduate work in astronomy or astrophysics. It also is a suitable focus for students who do not plan to pursue a graduate degree but anticipate a career in science journalism, teaching, science administration, or public relations. The course work includes that of the standard Physics major plus three courses in astrophysics (Physics 137, 144, 145) and two courses in related branches of physics (selected from Physics 132, 134, 135, and 136). Some familiarity with computer programming and differential equations also is essential. Physics 20A or 20B provide a useful introduction to the language of astrophysics.

Graduate Program

The Department offers the M.S. and the Ph.D. degrees in Physics, the first in recognition of demonstrated knowledge of the basic facts and theories of physics, the second primarily in recognition of demonstrated capacity for independent research. Active programs of research are underway in high energy physics, condensed matter physics, low temperature physics, plasma physics, mathematical physics, gravitational physics, and astrophysics.

In general, graduate study in physics is expected to be a full-time activity. Other proposed arrangements should be approved by the Graduate Committee.

Complementing the formal courses, the Department offers regular colloquia and informal seminars. The graduate student is a member of an intellectual community and is expected to participate fully in departmental activities. Attendance at colloquia is considered an essential part of graduate study. In addition, there are regular weekly research seminars in condensed matter, high energy, plasma physics, and astrophysics.

About 80 graduate students of physics were enrolled in 1988-89.

Sources of support available to graduate students include teaching assistantships, research assistantships, and fellowships. Students planning to pursue graduate work in physics should obtain a copy of the Department's graduate brochure.

Master of Science in Physics

The requirements for the M.S. degree are: (1) at least three quarters of residence; and (2) mastery of graduate course material, which may be demonstrated by passing, with a grade of B or better, a *minimum* of nine quarter courses numbered between 200 and 259, including 211, 213A-B, 214A, and 215A-B, and a written comprehensive examination. Under special circumstances, a research project and thesis may be accepted in lieu of a written comprehensive examination. There is no foreign language requirement for the M.S. degree. In addition to the stated course requirements, all students who have not passed the Ph.D. qualifying examination must register for Physics 264 (Seminar in Conceptual Physics).

A typical program in preparation for the written examination for the M.S. degree would consist of 12 courses: 211 (Classical Mechanics); 212A-B (Mathematical Physics); 213A-B (Electromagnetic Theory); 214A-B (Statistical Physics); 215A-B (Quantum Mechanics); plus three electives chosen from Physics 212C, 213C, 214C, 215C, or undergraduate upper-division courses in related areas.

Doctor of Philosophy in Physics

The principal requirements for the Ph.D. degree are a minimum of six quarters of residence, passage of a written and a two-part oral examination, and successful completion and defense of a dissertation reporting results of original research. In addition, the Ph.D. candidate must complete certain graduate course requirements. There is no foreign language requirement for the Ph.D. degree.

Course Requirements. The student is required to exhibit mastery of the basic sequences, Mathematical Physics, Classical Mechanics, Electromagnetic Theory, Quantum Mechanics, Relativistic Quantum Mechanics, and Statistical Mechanics. A *minimum* of 15 quarter courses numbered between 200 and 259, including 211, 212A-B, 213A-B, 214A-B, and 215A-B-C, must be passed with a grade of B or better. Students are strongly encouraged to take Physics 211, 212A-B-C, 213A-B, and 215A-B-C in their first year of study. In addition, all students who have not passed the Ph.D. qualifying examination are required to register for Physics 264. It is expected that students, having selected a research specialty, will ordinarily take the core course in that subject (237A-B-C, 238A-B-C, or 239A-B-C-D) early in their graduate career.

Qualifying Examination. For advancement to Ph.D. candidacy, a student must pass a qualifying examination consisting of a written part and two oral parts. The written part, covering a broad range of fundamentals of physics at the advanced undergraduate and graduate levels, is normally taken in the fall following the student's first year. The first oral examination is administered shortly after the written examination. All members of the first oral committee will be from the Department of Physics. A second attempt at this set of examinations will be permitted if the first is not successful. A third attempt will be permitted only in extraordinary circumstances.

The second part of the oral examination will be taken approximately one year after successful completion of the written examination and the first oral. The candidacy committee that administers the second oral examination will contain one or two faculty members from outside the Physics Department. The second oral will cover material principally related to the broad and general features of the student's dissertation area.

Teaching Program. Experience in teaching is an integral part of the graduate program, and all graduate students are expected to participate in the teaching program for at least three quarters during their graduate careers.

Dissertation. A dissertation summarizing the results of original research performed by the student under the supervision of a doctoral committee appointed by the Graduate Council will be required for the Ph.D. degree. A criterion for the acceptability of a dissertation by the Department is that it be suitable for publication in a scientific journal. The dissertation must not have been submitted to any other institution prior to its submission to the Physics Department at UCI.

Defense of Dissertation. Upon completion of the dissertation, the student will take an oral examination, open to the public, before the doctoral committee.

Suggested Course Sequence. Typical programs for the first two years designed to prepare the student for Ph.D. qualification and provide the foundation necessary for understanding and participating in modern research might include:

First Year: 211 (Classical Mechanics); 212A-B-C (Mathematical Physics); 213A-B (Electromagnetic Theory); 215A-B-C (Quantum Mechanics).

In the second and third years of graduate study, the student will take courses providing a background for dissertation research. Areas of concentration may include courses as shown below:

For the student with an interest in astrophysics:

213C (Modern Optics); 214A-B (Statistical Physics); 216 (Particle Physics); 217 (Nuclear Physics); 222 (Hydrodynamics); 236A-B-C (Astrophysics); 255 (General Relativity).

For the student with an interest in condensed matter physics:

221 (Elasticity); 222 (Hydrodynamics); 214A-B (Statistical Physics); 214C-D (Many Body Theory); 235A (Advanced Quantum Mechanics); 232A-B (Group Theory); 238A-B-C (Solid State Theory).

For the student with an interest in elementary particle physics:

237A-B-C (Elementary Particle Theory); 235A-B (Advanced Quantum Mechanics); 232B (Group Theory); 214A-B (Statistical Physics).

For the student with an interest in plasma physics:

212C (Mathematical Physics); 214A-B (Statistical Physics); 239A-B-C-D (Plasma Physics); 249A-B-C (Plasma Physics).

Lower-Division Courses

1 Preparation for Physics (4) F. Lecture, three hours; discussion, one hour. Mathematical review, introduction to calculus and vectors, and the uses of these techniques in physics. Analysis of experimental data. Physical units.

3A-B-C Basic Physics (4-4-4) F, W, S, Summer. Lecture, three hours; discussion, one hour. **3A:** survey of physical theory; Newtonian mechanics. **3B:** electricity and magnetism; radiation and waves; optics; heat phenomena. **3C:** twentieth-century physics; relativity; quantum ideas; atomic and nuclear physics. Prerequisite or corequisite: Mathematics 2A-B-C. (II)

3LA-LB Basic Physics Laboratory (1.5-1.5) F, W, Summer. Laboratory accompanying Physics 3A-B, three hours. (II)

5A-B-C-D-E Fundamental Physics (4-4-4-4-4) W, S, F, W, S; 5A-B (Summer). Lecture, three hours; discussion, one hour. **5A:** Newtonian mechanics, kinematics, and dynamics of motion. Facility in calculus is assumed. Corequisite: Mathematics 2B. **5B:** equilibrium mechanics; fluids and elasticity; oscillations and waves. Corequisite: Mathematics 2C. **5C:** electrostatics, magnetostatics, currents and fields, circuit elements, Maxwell's equations. Prerequisites: Mathematics 2A-B-C. **5D:** electromagnetic radiation; interference, diffraction; quantum mechanics; atomic physics. **5E:** thermodynamics and kinetic theory, relativity. Concurrent enrollment in Physics 5L is required each quarter (laboratory requirement may be waived by consent of instructor). Physics 5A-B-C (II)

5LB-LC-LD-LE Fundamental Physics Laboratory (1.5-1.5-1.5-1.5) S, F, W, S; 5LB-LC (Summer). Laboratory accompanying Physics 5B-C-D-E, three hours. Physics 5LB-LC (II)

Courses for Nonmajors

Course numbers between 10 and 24 are assigned to courses especially designed for students majoring in programs other than the physical sciences.

16 The Physics of Nuclear Weapons and Their Control (4) S. Lecture, three hours. Nuclear physics, fission, fusion, and radiation. Effects of thermal radiation, fallout, EM pulse, and blast. Physics of arms control verification techniques and missile defense systems. Primarily for students not majoring in Physics. Prerequisites: Physics 17A-B or Physics 3A-B or consent of instructor. (II)

17A-B Conceptual Physics (4-4) F, W. Lecture, three hours. Introduces the nonscience student to important ideas of physics with an emphasis on the human and historical developments. Topics include Newtonian mechanics and the revolutions of relativity and quantum mechanics. Experimental necessity for these and their philosophical implications. No mathematics background required, but high school algebra recommended. (II)

20 Physics of the Cosmos. Introduction to the physics of the universe, primarily for the nonmajor. The formation, structure, and evolution of planets, stars, galaxies, and the universe as a whole. Any three of the four courses satisfy the natural science breadth requirement.

20A Observational Astronomy (4) F, W. History of astronomy. Underlying physics. Objects in the solar system and how they are studied. Properties of stars: their formation, structure and evolution. Pulsars and black holes. Galaxies and quasars. (II)

20B Cosmology: Man's Place in the Universe (4) W. "Cook's tour" of the universe. Ancient world models. Evidence for universal expansion; the size and age of the universe and how it all began. The long-range future and how to decide the right model. Anthropic principle. (II)

20C Geophysics: The Making of the Earth (4) S. How the earth came to be and how it is studied. Causes and effects of earthquakes, mountains, valleys, rivers, glaciers, deserts, and oceans. Continental drift and plate tectonics. Causes and uses of the earth's magnetic field. Geophysics and the environment. (II)

20D Space Science (4) W. Motions of planets, satellites, and rockets. Propulsion mechanisms and space flight. The solar radiation field and its influence on planets. The interplanetary medium, solar wind, and solar-terrestrial relations. (II)

21-24 Special Topics in Physics (4). Lecture, three hours. Topics of special interest varying from year to year. Past topics have included super-cold, Newton, physics via demonstration, the physics of music, and Rainbows and Things. May be repeated for credit if topic varies.

Upper-Division Courses

110A-B-C Methods of Mathematical Physics (4-4-4) F, W, S. Lecture, three hours; discussion, one hour. Provides mathematical tools for upper-division physics courses. Topics include ordinary and partial differential equations, special functions, boundary value problems. Fourier and Laplace transforms, linear algebra and tensor analysis, and complex functions. Application of mathematical methods to physical problems are stressed. Prerequisites: Mathematics 3A, 3B-C or equivalent. Same as Mathematics 143A-B-C.

111A-B Classical Mechanics (4-4) F, W. Lecture, three hours; discussion, one hour. Mechanics of particles through Lagrangian and Hamiltonian methods; rigid bodies; relativity; coupled systems. Prerequisite: Physics 5D or consent of instructor.

112A-B Electromagnetic Theory (4-4) 112A (S), 112B (F). Lecture, three hours; discussion, one hour. Electrostatics; magnetostatics; properties of matter; Maxwell's equations; relativity; radiation; optics. Prerequisites: Physics 5C; Mathematics 3A, 3B-C; Physics 110A-B.

113A-B-C Quantum Physics (4-4-4) F, W, S. Lecture, three hours; discussion, one hour. Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology. Prerequisites: Physics 5A-B-C-D-E or equivalent; Physics 110A-B-C or equivalent.

115 Statistical Physics (4) W. Lecture, three hours. Microscopic theory of temperature, heat, and entropy; kinetic theory; multicomponent systems; quantum statistics. Prerequisites: Physics 5E, Mathematics 3C.

116 Thermodynamics (4) S. Lecture, three hours. Macroscopic theory of temperature, heat, and entropy; mathematical relationships of thermodynamics; heat engines; phase transitions. Prerequisites: Physics 5E, Mathematics 3C.

131 Computational Physics (4) S. Lecture, three hours. Modern numerical techniques on state-of-the-art computers for solving problems in physics. Applications to ordinary differential equations, boundary value problems, partial differential equations, stochastic differential equations (Monte Carlo). Prerequisite: Physics 113A.

132 Introduction to Nuclear Physics (4). Lecture, three hours. Nucleons and nuclear structure, radioactivity, neutron-proton scattering, the deuteron, nuclear reactions. Prerequisite: Physics 113A.

133 Introduction to Condensed Matter Physics (4) S. Lecture, three hours. Phenomena of solids and their interpretation in terms of quantum theory. Prerequisites: Physics 5D-E.

134 Introduction to Modern Optics (4) W. Lecture, three hours. Interaction of radiation with matter; lasers; nonlinear optics; optical properties of solids; absorption and scattering of light; modern spectroscopic techniques. Prerequisites: Physics 112B and 113A.

135 Introduction to Plasma Physics (4) F. Lecture, three hours. Ionization and discharge mechanisms; microscopic motions and kinetic equations; macroscopic fluid theories; electrodynamics of plasma; waves and instabilities; examples of laboratory and cosmic phenomena. Prerequisites: Physics 5D-E.

136 Introduction to Particle Physics (4) W. Lecture, three hours. Experimental techniques and theoretical concepts of high-energy phenomena: accelerators and detectors; classification of particles and interactions; particle properties; symmetries and mass multiplets; production and decay mechanisms. Prerequisite: Physics 113A.

137 Introduction to Cosmology (4). Lecture, three hours. Structure and evolution of galaxies, general relativistic models of the universe, observational tests of cosmological models, early phases of the universe, unconventional cosmologies. Not offered 1989-90.

139 Technical Writing and Communicating Skills (4) F, W, S. Lecture, four hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisite: upper-division standing; satisfaction of the lower-division writing requirement. Open to Physics majors only. Same as Chemistry 139 and Mathematics 139.

144 Stellar Astrophysics (4). Lecture, three hours. Stars: their structure and evolution; physical state of the interior; the Hertzsprung-Russell diagram, stellar classification, and physical principles responsible for the classification; star formation; nuclear burning; giant and dwarf stars; neutron stars and black holes. Prerequisite: Physics 5E or consent of instructor. Not offered 1989-90.

145 High Energy Astrophysics (4) S. Lecture, three hours. Production of radiation by high energy particles. Evolution of galactic nuclei, radio galaxies, quasars, and pulsars. Cosmic rays and the cosmic background radiation. Prerequisite: Physics 5E or consent of instructor.

150 Electronics for Scientists I (4) F. Lecture, two hours; laboratory, four hours. Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits. Prerequisite: Physics 5E or consent of instructor.

151, 152, 153 Advanced Laboratory I, II, III (4-4-4) F, W, S. Lecture, one hour; laboratory, eight hours. Experiments in atomic, condensed matter, nuclear, particle, and plasma physics. Introduction to instrumentation and a first experience in the research laboratory. Corequisite: Physics 113A. Prerequisites: Physics 112A and 150. Physics 150 may be waived by consent of instructor.

164 Seminar in Conceptual Physics (1-1) S. Discussion of physics as an interrelated discipline; practice in oral presentation of ideas and problems. Prerequisite: Physics 5A-B-C-D-E or consent of instructor. Pass/Not Pass only.

187 Medical Physics (4). Lecture, three hours. Physics of medical imaging techniques including x-radiology, nuclear medicine, ultrasound, and nuclear magnetic resonance. Topics include interactions of electromagnetic, nuclear, and sonic radiation with matter, nuclear resonance, computer tomography. Instrumentation and methodology for imaging are discussed. Prerequisite: Physics 5E or consent of instructor. Not offered 1989-90.

195 Undergraduate Research (4). Open to seniors and occasionally to juniors with consent of the Department. P/NP only.

199 Readings on Special Topics (4). With consent of the Department. P/NP only.

Graduate Courses

211 Classical Mechanics (4) F. Lecture, three hours. Variational principles, Lagrange's equations; applications to two body problems, small oscillation theory, and other phenomena. Hamilton's equations. Hamilton-Jacobi theory. Canonical transformations.

212A-B-C Mathematical Physics (4-4-4) F, W, S. Lecture, three hours. Ordinary differential and partial differential equations; complex variables and special functions; matrices, eigenvalues and eigenvectors; numerical methods; perturbation theory; integral equations; calculus of variations; elements of group theory.

213A-B Electromagnetic Theory (4-4) W, S. Lecture, three hours. Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

213C Modern Optics (4) S. Lecture, three hours. Modern optics, linear and non-linear. Waves in dispersive media, weak nonlinearities, higher order interactions, light scattering, strong nonlinearities, laser radiation. Prerequisites: Physics 213A-B.

214A-B Statistical Physics (4-4) F, W. Lecture, three hours. Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensemble theory, ideal and imperfect gases; thermodynamic properties of solids; cooperative phenomena; phase transitions of first and second order; fluctuations.

214C-D Many Body Theory (4-4) S, F. Application of field theory methods, perturbative and non-perturbative to many particle systems. **214C:** second quantization, Feynman diagrams, linear response theory and functional integral methods applied to the ground state; **214D:** and at finite temperature.

215A-B-C Quantum Mechanics (4-4-4) F, W, S. Lecture, three hours. Foundations of quantum theory; Dirac notation, basic operators and their eigenstates; perturbation theory; variational method; spin; Clebsch-Gordon coefficients; structure of atomic systems; scattering theory; formal collision theory; semi-classical radiation theory; quantization of the electromagnetic field; relativistic quantum mechanics; second quantization of many body systems.

221 Elasticity (4). Lecture, three hours. Analysis of strain and stress; elasticity of crystals; equilibrium of isotropic elastic solids and of half-spaces; bending of rods and plates; two-dimensional elastic systems; propagation of waves in elastic solid media; surface waves; piezo-electric solids; dislocations; thermoelasticity. Not offered 1989-90.

222 Hydrodynamics (4) W. Lecture, three hours. Hydrodynamics of a perfect fluid; two-dimensional problems, motion of an incompressible viscous fluid; Navier-Stokes equations; viscous fluids in rotation; motion in three dimensions; introduction to motion of a compressible fluid.

232A-B Applications of Group Theory (4-4) F, W. Lecture, three hours. The role of symmetry in physical problems. **232A:** finite groups; **232B:** continuous groups. 232B can be taken without 232A. Abstract group theory and theory of group representations. Perturbation theory, selection rules, crystal tensors, molecular vibrations, Jahn-Teller theorem, directed valence, time reversal symmetry, double groups, crystal field splittings of atomic levels. Continuous groups and particle physics. Full rotation group, Clebsch-Gordon coefficients, the Wigner-Eckart theorem, Racah coefficients, the Lorentz group, unitary groups.

235A-B Advanced Quantum Mechanics (4-4) F, W. Lecture, three hours. Fall: Lagrangian formalism, second quantization, interacting fields, perturbation theory. Winter: Feynman graph techniques, renormalization, symmetries, PCT theorem, connection between spin and statistics.

236A-B-C Astrophysics (4-4-4) F, W, S. Lecture, three hours. Theoretical background and survey of astrophysical research. **236A:** Fundamentals of astrophysics; overview, radiation mechanisms, plasma and magnetic effects. **236B:** Stellar and related astrophysics; stellar structure and evolution, white dwarfs, neutron stars, supernovas, supernova remnants. **236C:** Nonstellar astrophysics; quasars; black holes, cosmic rays, cosmology.

237A-B-C Elementary Particle Theory (4-4-4) F, W, S. Lecture, three hours. Background and current topics in elementary particle theory including weak interactions, unified gauge theory of weak and electromagnetic interactions, quark-parton model of small distance structure, quark model of hadron spectroscopy, charmed particles, new quarks and leptons, and an introduction to quantum chromodynamics. May be repeated for credit.

238A-B-C Solid State Theory (4-4-4) F, W, S. Lecture, three hours. Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory.

239A-B-C-D Plasma Physics (4-4-4-4) F, W, S, F. Lecture, three hours. The properties of plasmas, with major emphasis on fully ionized gases. Introduction to modern theoretical treatments. Applications to problems such as controlled thermonuclear fusion, propulsion, energy conversion, astrophysics, and the space sciences. **239A:** Introduction, magnetohydrodynamics, equilibrium, and stability. **239B:** Theory of cold plasma waves, thermal effects. **239C:** The Vlasov equation, microinstabilities and transport, plasma turbulence. **239D:** Multiple wave interactions, quasi-linear theory, nonlinear plasma theory.

248A-B-C Special Topics in Condensed Matter Physics (4-4-4) F, W, S. Lecture, three hours. Each quarter outlines and emphasizes a subarea of condensed matter physics that is undergoing rapid development. May be repeated for credit.

249A-B-C Special Topics in Plasma Physics (4-4-4) F, W, S. Lecture, three hours. For advanced students of plasma physics. Three quarters are offered, one quarter each in turbulence and diagnosis of laboratory plasmas, pulse power beams, and beam-plasma interactions. Prerequisites: Physics 239A-B-C or the equivalent. May be repeated for credit.

255 General Relativity (4). Lecture, three hours. An introduction to Einstein's theory of gravitation. Tensor analysis, Einstein's field equations, astronomical tests of Einstein's theory, gravitational waves. Not offered 1989-90.

Seminars and Research (260-299)

These courses are designed to acquaint students with the basic concepts and methods underlying current research activity in selected branches of physics.

260A-B-C Seminar in Condensed Matter Physics (4-4-4) F, W, S. Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Physics Department (both faculty and graduate students), other UCI departments, and other institutions. May be repeated for credit. Prerequisite: consent of instructor.

261A-B-C Seminar in Plasma Physics (4-4-4) F, W, S. Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics. Prerequisite: Physics 239A-B-C-D or equivalent.

263A-B-C Seminar in High Energy Physics (4-4-4) F, W, S. Discussion of advanced topics and reports of current research results in theoretical and experimental high energy physics and cosmic rays. May be repeated for credit. Prerequisite: consent of instructor.

264 Seminar in Conceptual Physics (1) S. Discussion of physics as an interrelated discipline, practice in oral presentation of ideas and problems. Required of all graduate students who have not passed the Ph.D. qualifying examination.

265A-B-C Seminar in Astrophysics (4-4-4) F, W, S. Acquaints students with current research in astrophysics. Lectures from the Department of Physics and from other institutions. May be repeated for credit.

267A-B-C Current Problems in High Energy Physics (4-4-4) F, W, S. Lecture, three hours. Presentation and discussion of current research and theory in high energy physics. Lectures given by staff and students. May be repeated for credit.

295 Experimental Research (4 to 12). With the approval of a faculty member, a student may pursue a research program in experimental physics. Typical areas include low temperature physics, plasma physics, spectroscopy, solid state physics, and elementary particle physics.

296 Theoretical Research (4 to 12). With approval of a faculty member, a student may pursue a research program in theoretical physics. Typical areas include solid state physics, low temperature physics, plasma physics, spectroscopy, and elementary particle physics.

298 Physics Colloquium (0). Seminar held each week, in which a current research topic is explored. Frequently, off-campus researchers are invited to present the seminar, and on occasion a faculty member or researcher from the Department will speak.

299 Reading of Special Topic (4 to 12). With special consent from a faculty member who will agree to supervise the program, a student may receive course credit for individual study of some area of physics.

399 University Teaching (1-4) F, W, S. Required of and limited to Teaching Assistants.

School of Social Sciences

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Duran Bell, Ph.D. University of California, Berkeley, *Associate Professor of Economics and Anthropology*

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Isabel Birnbaum, Ph.D. University of California, Berkeley, *Professor of Psychology*

Hagit Borer, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Linguistics and Cognitive Sciences*

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Michael Butler, J.F., Society of Fellows, Harvard University, *Associate Dean for Undergraduate Studies, School of Social Sciences, Associate Professor of Social Sciences, and Director of the Farm School*

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Frank Cancian, Ph.D. Harvard University, *Professor of Anthropology*

Douglas K. Chalmers, Ph.D. University of Iowa, *Associate Professor of Psychology*

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Tyler Cowen, Ph.D. Harvard University, *Assistant Professor of Economics*

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James N. Danziger, Ph.D. Stanford University, *Chair of the Department of Politics and Society and Professor of Political Science*

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Michael D'Zmura, M.A. Harvard University, *Acting Assistant Professor of Psychology*

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Harry Eckstein, Ph.D. Harvard University, *UCI Distinguished Professor of Political Science*

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Linton Freeman, Ph.D. Northwestern University, *Professor of Social Sciences*

Creel Froman, Ph.D. Northwestern University, *Professor of Social Sciences*

Maxwell Fry, Ph.D. London School of Economics, *Professor of Economics*

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Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science and Social Psychology*

Carl L. Hansen, Ph.D. University of Wisconsin, *Associate Professor of Earth Sciences, University of California, Riverside and Irvine*

Ping-ti Ho, Ph.D. Columbia University, *Visiting Distinguished Professor of Social Sciences and History*

Donald Hoffman, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Psychology and of Information and Computer Science*

Tarow Indow, Ph.D. Keio University, *Professor of Psychology*

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Sheen T. Kassouf, Ph.D. Columbia University, *Professor of Economics*

Gregory S. Kavka, Ph.D. University of Michigan, *Professor of Philosophy and Social Sciences*

Mary-Louise Kean, Ph.D. Massachusetts Institute of Technology, *Associate Vice Chancellor Academic Plans and Programs and Professor of Linguistics, Social Sciences, and Psychobiology*

Robin L. Keller, Ph.D. University of California, Los Angeles, *Assistant Professor of Administration and Social Sciences*

George Kent, Ph.D. University of California, Berkeley, *Associate Professor of Social Sciences*

Jerome Kirk, Ph.D. The Johns Hopkins University, *Associate Professor of Anthropology and Sociology*

David LaBerge, Ph.D. Stanford University, *Professor of Psychology*

Charles Lave, Ph.D. Stanford University, *Professor of Economics*

Jean C. Lave, Ph.D. Harvard University, *Professor of Anthropology*

H. Hiro Lee, Ph.D. University of California, Berkeley, *Assistant Professor of Economics*

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David M. Lilien, Ph.D. Massachusetts Institute of Technology, *Professor of Economics*

John M. Liu, Ph.D. University of California, Los Angeles, *Assistant Professor of Comparative Culture and Social Sciences*

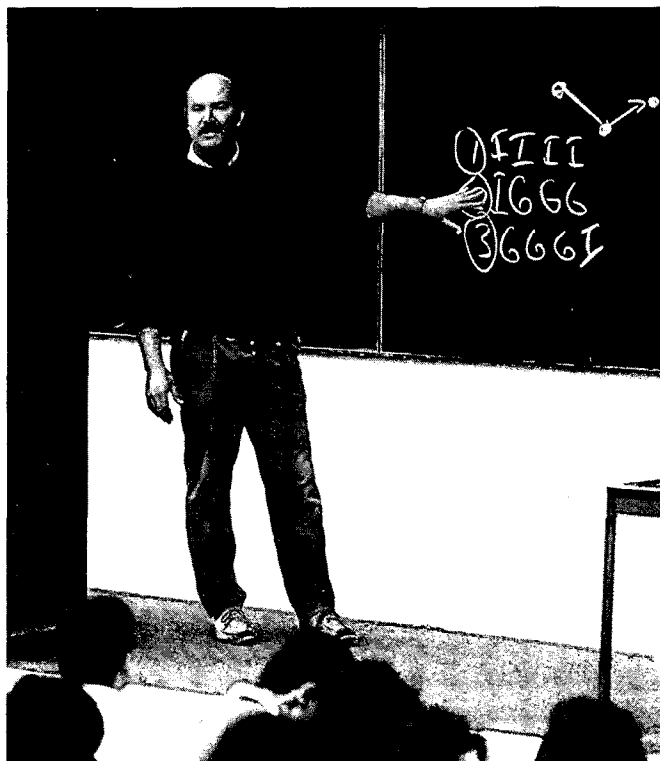
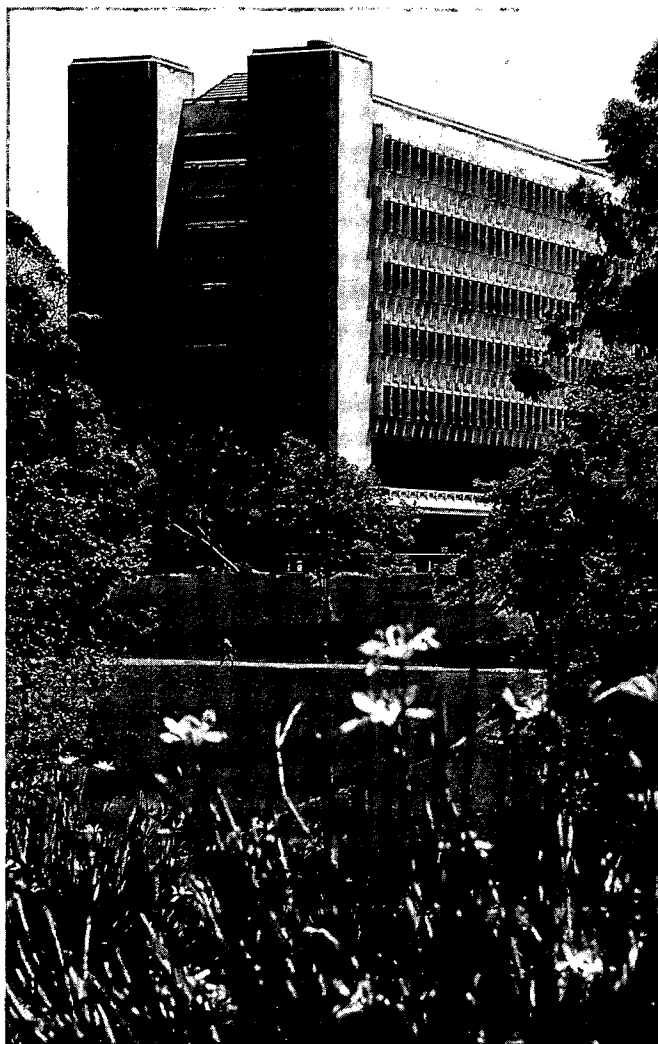
R. Duncan Luce, Ph.D. Massachusetts Institute of Technology, *Director, Irvine Research Unit in Mathematical Behavioral Science and UCI Distinguished Professor of Psychology*

Gary Lynch, Ph.D. Princeton University, *Professor of Psychobiology, Social Sciences, and Surgery*

Craig MacAndrew, Ph.D. University of Chicago, *Professor of Psychology*

Virginia Mann, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Psychology*

Julius Margolis, Ph.D. Harvard University, *Professor Emeritus of Economics*



Undergraduate and graduate programs in the School of Social Sciences are characterized by an emphasis on empirical observation and quantitative analysis, as well as an interdisciplinary, theoretical approach. Shown above is Associate Professor Shawn Rosenberg lecturing in Introduction to Social Psychology, a course which is available through the Department of Cognitive Sciences and the Department of Sociology.

Robert May, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Linguistics*

James L. McGaugh, Ph.D. University of California, Berkeley, *Chair of the Department of Psychobiology and Professor of Psychobiology, Psychiatry and Human Behavior, Psychology, and Social Sciences*

Duane Metzger, Ph.D. University of Chicago, *Professor of Anthropology and Social Sciences*

Kristen R. Monroe, Ph.D. University of Chicago, *Associate Professor of Political Science*

Carlton Moss, *Lecturer in Comparative Culture and Social Sciences*

Giovanna Mossetti, Ph.D. University of California, Los Angeles, *Assistant Professor of Economics*

Louis Narens, Ph.D. University of California, Los Angeles, *Professor of Social Sciences and Psychiatry and Human Behavior*

Robert Newcomb, Ph.D. University of California, Santa Barbara, *Senior Lecturer in Social Sciences*

Jack W. Peltason, Ph.D. Princeton University, *Chancellor and Professor of Political Science*

Mark P. Petracca, Ph.D. University of Chicago, *Assistant Professor of Social Science*

Henry N. Pontell, Ph.D. State University of New York, Stony Brook, *Associate Professor of Social Ecology and Social Sciences*

M. Ross Quillian, Ph.D. Carnegie-Mellon University, *Associate Professor of Social Sciences*

A. Kimball Romney, Ph.D. Harvard University, *Professor of Social Sciences and Anthropology*

Shawn Rosenberg, M. Litt. University of Oxford, *Associate Professor of Political Science and Social Psychology*

Arthur Rubel, Ph.D. University of North Carolina, *Professor of Medicine and Social Sciences*

Curt A. Sandman, Ph.D. Louisiana State University, *Professor of Psychiatry and Human Behavior and Social Sciences in Residence*

Barry J. Schein, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Linguistics*

William R. Schonfeld, Ph.D. Princeton University, *Dean of the School of Social Sciences and Professor of Political Science*

Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Professor of Political Science*

Stergios Skaperdas, Ph.D. The John Hopkins University, *Assistant Professor of Economics*

Kenneth A. Small, Ph.D. University of California, Berkeley, *Associate Dean of Graduate Studies, School of Social Sciences, and Professor of Economics*

David A. Smith, Ph.D. University of North Carolina, Chapel Hill, *Assistant Professor of Sociology*

Dorothy Solinger, Ph.D. Stanford University, *Associate Professor of Political Science*

Arnold Starr, M.D. New York University School of Medicine, *Department Chair and Professor of Neurology, Professor of Social Sciences, Physiology, and Psychobiology*

James M. Swanson, Ph.D. Ohio State University, *Professor of Psychiatry and Pediatrics and Social Sciences in Residence*

Rein Taagepera, Ph.D. University of Delaware, *Professor of Social Sciences and Political Science*

Dickran Tashjian, Ph.D. Brown University, *Professor of Comparative Culture and Social Sciences*

Gary Thom, Ph.D. Yale University, *Associate Professor of Political Science*

Judith Treas, Ph.D. University of California, Los Angeles, *Chair of the Department of Sociology and Professor of Sociology*

Carole Uhlaner, Ph.D. Harvard University, *Associate Professor of Political Science*

Howard B. Waitzkin, M.D., Ph.D. Harvard University, *Chief of General Internal Medicine and Primary Care and Professor of Medicine and Social Sciences*

W.C. Watt, Ph.D. University of Pennsylvania, *Professor of Cognitive Sciences*

Martin P. Wattenberg, Ph.D. University of Michigan, *Associate Professor of Political Science*

Christian Werner, Ph.D. The Free University of Berlin, *Professor of Social Sciences*

Douglas R. White, Ph.D. University of Minnesota, *Professor of Anthropology*

Joseph L. White, Ph.D. Michigan State University, *Professor of Comparative Culture and Psychology*

John M. Whiteley, Ed.D. Harvard University, *Professor of Social Ecology and Social Sciences*

John I. Yellott, Jr., Ph.D. Stanford University, *Chair of the Department of Cognitive Sciences and Professor of Psychology*

Undergraduate and graduate education in the School of Social Sciences at UCI represents a commitment to modern social science. The classic subject areas of anthropology, economics, geography, linguistics, political science, psychology, and sociology are included in the School's educational programs, but these programs go well beyond the traditional disciplines and can be characterized by the following three-way emphasis:

First, the faculty recognizes the value of systematic empirical observation and quantitative analysis in the study of human behavior. Developments in computer science and in mathematics oriented toward the problems of the social sciences, and the refinement of techniques for the observational, experimental, and statistical study of human behavior, have contributed major new elements to social science. Students in the School of Social Sciences will become familiar with the mathematical, computational, and statistical tools underlying modern social science.

Second, many of the most interesting questions in the study of human behavior cannot be fixed within the traditional disciplinary boundaries. Some of the new and evolving areas which cross orthodox boundaries are political sociology, public policy, cognitive anthropology, comparative culture, and psycholinguistics. Therefore many courses and course modules are built around social science phenomena rather than representing social science disciplines.

Third, the School shares the academic philosophy that considers the design of hypotheses and of systems of interrelated ideas about the possible structure of the world to be an essential part of scientific pursuit. Consequently, the educational programs place substantial emphasis on understanding social science phenomena through the development of theories that can be used to guide empirical studies.

Educational opportunities for students in the School of Social Sciences extend well beyond attendance at courses. Students may develop independent study proposals in cooperation with interested faculty members; they are invited to participate in the quarterly evaluation of courses and instructors, to propose new courses and other modifications in existing programs, to nominate candidates for visiting faculty appointments, and to serve on School committees. The School provides a variety of opportunities for faculty-student interaction, and students will find the faculty, administration, and academic counseling staff of the School highly accessible and responsive.

Careers in Social Sciences

Graduates of the School of Social Sciences find many and diverse career opportunities. Social Sciences graduates have been in demand for jobs in government, primary and secondary teaching, and human services, as well as for careers in business. Many Social Sciences graduates have gone on to further studies, some at the doctoral level in preparation for careers in research and university teaching, others in the professions of law and medicine, in education, and in business administration.

Because all Social Sciences degrees involve an educational program that is interdisciplinary and that prepares students to understand quantitative methods of data analysis, graduates of the School are well-positioned for research and analysis positions in all levels of government and in private firms. Their solid grounding in contemporary social science

methods and their familiarity with a broad spectrum of social scientific thinking gives them an excellent foundation for the pursuit of further training in graduate and professional programs.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Special Facilities

The School of Social Sciences maintains several special facilities for research and education. The Social Sciences Research Laboratory occupies the entire fourth floor of the Social Sciences Laboratory Building. The facility contains 40 experiment and control rooms situated around a central core where two Micro Vax II systems are available for experimental research. The laboratory is used for both faculty and student research.

The Farm School, a small, open, and ungraded elementary school located in a rural setting adjacent to the campus, serves as a research facility for faculty and students having interests in children and how they learn. Each quarter undergraduates receive course credit for assisting staff teachers, for developing educational materials, and for observing and analyzing child behavior at the school.

The Laboratory of Anthropology is used for research in medical anthropology, quantitative studies, discourse analysis, and artificial intelligence. Facilities include personal computers; computer terminals and software for statistical studies, parallel distributed processing, and content analysis; and a laboratory for biochemical assays.

Visiting Distinguished Professorships

The School of Social Sciences sponsors a program of Visiting Distinguished Professorships that exposes students to seminal thinkers in the social sciences. The professorships normally are of a quarter's duration. Participants have included Martin Bronfenbrenner, Kenan Professor of Economics at Duke University and Fellow of the American Academy of Arts and Sciences; Philip Converse, Robert C. Angell Professor of Political Sciences and Sociology (University of Michigan), President of the American Political Science Association, and member of the National Academy of Sciences and the American Academy of Arts and Sciences; Beatrice Whiting, Professor of Anthropology and Education Emeritus, Graduate School of Education (Harvard University), and member of the American Academy of Arts and Sciences; John Whiting, Professor of Social Anthropology (Harvard University) and member of the American Academy of Arts and Sciences; and James Coleman, University Professor of Sociology (University of Chicago) and member of the National Academy of Sciences and the American Academy of Arts and Sciences.

Degrees

Anthropology	B.A.
Comparative Culture	B.A., M.A., Ph.D.
Economics	B.A., M.A., Ph.D.
Geography*	B.A.
Linguistics	B.A.
Political Science	B.A., Ph.D.
Psychology	B.A., Ph.D.
Social Science	B.A., M.A., Ph.D.
Sociology	B.A.

*The major of Geography is not available at this time; however, courses in Geography are offered on a regular basis.

Within the Ph.D. in Social Science are two optional concentrations:

Social Networks, supervised by the faculty in mathematical social science.

Social Relations, supervised by the faculties in anthropology and sociology.

Honors

Honors at graduation, i.e., *cum laude*, *magna cum laude*, or *summa cum laude*, are awarded on the basis of academic performance. Of the graduating seniors, approximately 1 percent will be awarded *summa cum laude*, 3 percent *magna cum laude*, and 8 percent *cum laude*. To be considered for honors, a student must have a minimum of 72 units in residence at a University of California campus and must submit an application for the B.A. degree *by the end of winter quarter* of the senior year.

Transfer Students

Freshmen and Sophomores: Students transferring to UCI as freshmen or sophomores will fulfill the regular requirements of the four-year program either through work at UCI or through transfer credit for comparable work elsewhere.

Juniors: Junior transfers electing to major in one of the School's degree programs and with good records at other accredited colleges and universities normally will be presumed to have satisfied School requirement B and the University requirements, with the exception of the upper-division writing requirement of the breadth requirement (Category I). Students anticipating transfer to UCI in their junior year, however, should plan their programs so as to anticipate the special mathematics requirements of the program (School requirement A). Every effort will be made to accommodate individual variation in background, provided students are prepared to commit themselves to intensive work in areas of deficiency. Ordinarily, the typical two-year program for junior transfers is simply the last two years of the regular four-year program, except that students who have not satisfied the mathematics requirements of the School should plan to do so in the junior year and must do so before graduation.

Seniors: Students wishing to graduate with a degree in the School by transferring to UCI in their senior year should plan their work carefully to ensure that the requirements can be met in one year of residence. In general, differences between the program at UCI and programs elsewhere make senior transfers difficult.

3-2 Program with the Graduate School of Management

Outstanding students who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the Graduate School of Management section for additional information.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61-62.

Minor in Global Peace and Conflict Studies

Participating Faculty

Dennis Aigner, Graduate School of Management
 Francesca Cancian, School of Social Sciences
 Gordon Chang, School of Humanities
 Joseph DiMento, Program in Social Ecology
 Lawrence Howard, School of Social Sciences
 Karl Hufbauer, School of Humanities
 Jon Jacobson, School of Humanities
 Gregory Kavka, School of Humanities
 Jon Lawrence, School of Physical Sciences
 Herbert Lehnert, School of Humanities
 Guy de Mallac, School of Humanities
 Julius Margolis, School of Social Sciences
 Calvin McLaughlin, School of Biological Sciences
 Seymour Menton, School of Humanities
 Keith Nelson, School of Humanities
 Riley Newman, School of Physical Sciences
 Frederick Reines, School of Physical Sciences
 Shawn Rosenberg, School of Social Sciences
 Sherwood Rowland, School of Physical Sciences
 Roland Schinzinger, School of Engineering
 Caesar Sereseres, School of Social Sciences
 Rein Taagepera, School of Social Sciences
 John Whiteley, Program in Social Ecology

The minor in Global Peace and Conflict Studies is an interdisciplinary curriculum designed to introduce the student to the phenomenon of international violence in the twentieth century, with particular attention to the danger of nuclear war and the challenge of creating a satisfactory and enduring peace. The minor is available through the School of Humanities, the Program in Social Ecology, and the School of Social Sciences. The minor and its courses, however, are open to all UCI students.

Participants in the minor must complete the equivalent of nine courses, beginning in the sophomore year with an introductory series and culminating later with the Peace and Conflict Forum and its related Seminar, usually taken during the senior year. The student selects the remainder of the courses comprising the minor from an approved list of upper-division courses and must organize these choices in consultation with a panel of the participating faculty into a coherent interdisciplinary program complementary to the student's major.

Requirements for the Minor:

Three lower-division courses: History 11 (Introduction to Peace and Conflict), Social Science 26D (The Nuclear Arms Race), Physics 16 (Physics of Nuclear Weapons).

Five relevant upper-division courses. Among those usually offered are: History 146B (U.S. Foreign Relations Since World War II), Social Sciences 123G (U.S. Foreign Policy), Social Sciences 123D (U.S. National Security), Social Sciences 113E (Political Economy of National Defense), Social Sciences 122A-B (Soviet Society and Politics), History 133A, 133B, 133C (European International History), History 195 (Arms Control Simulation), Philosophy 182 (Issues in Social Philosophy), Social Ecology S178, S179, S180 (Social Ecology of Peace), Social Sciences 161Z (War, Peace, and Gender).

With approval of the Global Peace and Conflict Studies faculty, relevant lower-division courses may be substituted for up to two of the five upper-division courses.

A minimum of two quarters of Humanities 180 (same as Social Sciences 123S or Social Ecology E184)—Peace and Conflict Forum—total of two units maximum for credit.

One quarter of Humanities 181 (same as Social Sciences 123T or Social Ecology E185)—Peace and Conflict Seminar—totaling two units, taken during winter quarter of the senior year.

Further information concerning the minor is available in the Global Peace and Conflict Studies office, 734 Social Science Tower; telephone (714) 856-6410.

Concentration in Religious Studies

The undergraduate Concentration in Religious Studies encourages the student to examine religion and religious phenomena in the context of the several disciplines represented in the Schools of Humanities, Fine Arts, and Social Sciences. The Concentration, which is available with any major offered by these three Schools, is, for the most part, made up of courses already offered in the undergraduate curriculum; it allows the student to organize these courses, however, into a program complementary to the student's major. It is the objective of the Concentration that participating students expand their appreciation and understanding of religion in the context of their own major discipline while also developing critical abilities in the area of religious studies in its own right. While the Concentration takes as its subject all religion and religious phenomena and courses are offered in non-Western religious subjects, the academic specialties of the majority of the contributing faculty lie in Western traditions.

Students electing the Concentration are required to take eight one-quarter courses from those approved for the Concentration. The courses are gathered into three generic categories: religious theory and comparative religions, canonical literature, and topics in religious studies. Students take two courses from each category as well as two additional courses from among those approved for the Concentration. For further information and a quarterly list of courses available, please contact the Coordinator of the Concentration, 343 Humanities Office Building.

Planning a Program of Study

Since there are many alternative ways to plan a program, some of which may require careful attention to specific major requirements, students should consult with the Undergraduate Advising Office (122 Social Science Tower) to design an appropriate program of study.

Students who elect one of the Social Sciences majors in their freshman year might begin by taking the one-digit courses required by their major and one of the mathematics sequences listed under Part A of the School requirements. It is a good idea to take these courses early since they include fundamental concepts that will be widely applicable in more advanced courses. In addition, the lower-division writing requirement of the breadth requirement (Category I) should be completed during the first year. In the sophomore year, the student might complete the course on computing, three courses toward the breadth requirement, four courses in the social sciences, and four electives. Students who are planning to go on to graduate school can use their freshman and sophomore years to advantage by taking courses in theory, research methods, mathematics, and other areas important to

graduate study. In the junior and senior years, the student should take courses in the major area and should create an individualized program of study through a combination of courses and course modules which fall in an area of interest. Particular attention should be paid to planning a program of study that will ensure that major requirements are met prior to graduation.

Double Majors

In order to double major within the School of Social Sciences, the following conditions must be met:

- (1) Normally, neither major program may be the general social science program.
- (2) Major and School requirements must be met for *both* majors with no overlap of courses except for those used to satisfy the mathematics, computer science, and introductory social science requirements. The mathematics and computer science courses need only be taken once. Only two introductory social science classes are needed, provided this also meets the requirements of both major programs. The same two-digit and upper-division courses may *not* be used to meet the requirements of more than one major program. For example, a student who wishes to major in psychology and anthropology may take one of the mathematics sequences, Information and Computer Science 1, and may use Introduction to Psychology and Introduction to Anthropology to meet the major and School requirements for both programs. However, two different sets of two-digit and upper-division courses must be taken to complete the major and School requirements of the two programs.

Teaching Credentials

Students planning to seek State of California teaching credentials in social science should discuss their undergraduate curriculum plans with the School's academic counselors.

Mathematics and Social Science

The mathematics requirement stems from the nature of modern social science. The concepts and terms of mathematics, statistics, and computers are an important part of the social scientist's vocabulary. Basic knowledge of these tools is necessary to an understanding of current literature in the social sciences, to the analysis of data, and to an intelligent use of social science models. Each candidate for a degree in the School of Social Sciences is expected to have a basic knowledge of probability, statistics, and computing. In addition, for students who are preparing for graduate school in an area of social science, it will be important to supplement the minimal mathematics requirements with additional courses related to mathematics and social science methodology. The particular courses which would be recommended are not specified here, however, since they are highly dependent on the major emphasis of the student. Students who are preparing for graduate study should consult their advisors to determine a program of study which will give them the research skills necessary for successful graduate work.

Courses in Social Sciences

Courses in the School do not invariably resemble conventional university courses either in content or in format. Students at any level are encouraged to suggest areas of individual study and may (with faculty approval) pursue any intellectually challenging area within the social sciences. Such courses may include special seminars, study projects, individual papers, or any other useful educational activity. The faculty encourages students to present evidence that they have done interesting and original work and to receive official credit for that work by enrolling in an individual study

course. Such courses are numbered 198 and 199 (undergraduate) and 299 (graduate).

Students from other schools are encouraged to take courses and talk with faculty within the School. In addition to the introductory courses, many of the upper-division courses are open to students without previous work in social science. Most upper-division courses are arranged in modules in order to provide continuity over individual courses, to facilitate long-range planning by students, and to encourage the pursuit of interdisciplinary programs of study. Students are encouraged to take advantage of the module concept to acquire experience in several integrated sets of courses. *It is not necessary, however, for students to take all courses listed in a module; module courses may be taken individually, as long as course prerequisites have been met.*

The specific courses offered in module form may vary from year to year, but the structure of the curriculum will remain stable. Ordinarily, a student can expect to find at least one module offered in each broad area each year. By observing the content area of courses and by making effective use of module sequences, a student can assemble an individual program of study in a particular discipline or in an interdisciplinary area.

The *Catalogue* lists course descriptions of some of the proposed courses to be offered. A final listing of the courses offered will be available prior to the beginning of each quarter in 122 Social Science Tower. Students who are interested in obtaining this material may receive copies by visiting or writing to the School of Social Sciences.

NOTE: Students who entered UCI before fall quarter, 1989, should refer to previous editions for information on the course numbering and lettering system prior to fall 1989.

Undergraduate Program

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements

A. Familiarity with some basic mathematical, computational, and statistical tools underlying modern social science. This requirement is met by passing three courses in mathematics (Mathematics 2A-B-C, Social Sciences 11A-B-C, or Social Sciences 100A-B-C) and one course in computer science (Information and Computer Science 1A). These courses normally should be taken during the student's first year.

B. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking two introductory courses in the School of Social Sciences bearing a one-digit course number. These courses normally should be taken during the student's first year.

C. An understanding of important advanced areas in social science. This requirement is met by passing satisfactorily nine upper-division courses in the School of Social Sciences, where at least three of these courses comprise a module. (See "Courses in Social Sciences" below for a discussion of course modules.) For modules which are listed with more than three courses, the student may normally elect to take any subset of three courses in the module. Appropriate substitutions may be made upon petition.

D. Four additional social science courses from any level.

Students are reminded that the Pass/Not Pass option is not applicable to course requirements A through D above or to any additional requirements listed for specific major programs below. However,

Information and Computer Science 1A and Social Sciences 100A are exceptions to this rule and may be taken Pass/Not Pass.

Courses used to meet requirements B through D above are included in the computation of the grade point average in courses required in the major program.

Department of Anthropology

Anthropology is the comparative study of past and contemporary human societies and cultures. The Department of Anthropology emphasizes contemporary theory in social and cultural anthropology, the anthropological tradition of field research, and formal methods for collecting and analyzing anthropological data. The Department has a strong interdisciplinary bent, with research and teaching interests in psychological anthropology, economic anthropology, social history and social change, culture and health, and social structure.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major

School requirements must be met and must include 10 courses (40 units) as specified below:

- A. Social Sciences 2A.
- B. Social Sciences 2B or 2C.
- C. Three courses (12 units), one from each of three of the following topical areas in anthropology:
 - Kinship and Social Structure (Social Sciences 131A, 131B, 131G)
 - Economic and Ecological Anthropology (Social Sciences 131E, 131F, 131H, 131X)
 - Psychological and Cognitive Anthropology (Social Sciences 131M, 131N)
 - Religion and Ideology (Social Sciences 131R, 131S, 134D)

D. Two courses (eight units) on geographical areas, selected from those numbered Social Sciences 134 or from a list of approved courses.

E. Three additional anthropology courses (12 units) selected from those numbered Social Sciences 30-39, 70C, 130-139, or from a list of approved courses.

Students are strongly encouraged to take Social Sciences 35A early in their studies and Social Sciences 137A after they have had at least three courses beyond Social Sciences 2A, 2B, or 2C.

Anthropology Minor Requirements

Requirements for the minor in Anthropology are met by taking seven anthropology courses (28 units) as specified below:

- A. Social Sciences 2A.
- B. Social Sciences 2B or 2C.
- C. Three courses (12 units), one from each of three of the following topical areas in anthropology:
 - (1) Kinship and Social Structure (Social Sciences 131A, 131B, 131G)
 - (2) Economic and Ecological Anthropology (Social Sciences 131E, 131F, 131H, 131X)
 - (3) Psychological and Cognitive Anthropology (Social Sciences 131M, 131N)

(4) Religion and Ideology (Social Sciences 131R, 131S, 134D)

D. One course (four units) on a geographical area, selected from those numbered Social Sciences 134.

E. Two additional anthropology courses (eight units), selected from those numbered Social Sciences 30-39, 70C, 130-139, or from a list of approved courses.

F. In addition, students must either satisfy the School mathematics and computer science requirement (School requirement A), or take three courses (12 units) or equivalent in a single acceptable foreign language.

Lower-Division Courses

2 Introduction to Anthropology. Basic introduction to anthropology. These courses can be taken in any order.

2A Introduction to Sociocultural Anthropology (4). Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Stresses the application of anthropological methods to research problems. (III)

2B Introduction to Biological Anthropology (4). Evolutionary theory and processes, comparative primate behavior, primate fossil record, human variation, and the adequacy of theory, i.e., fit of theory and empirical data. (III)

2C Introduction to Archaeology (4). Archaeological theory and cultural processes with emphasis on the American Southwest, Mesoamerica, and Mesopotamia. (III)

31A Anthropology of the Family (4). The family is examined by comparing the various forms of intimate social organization that are, or have been, found in the world. Emphasis placed on families in non-Western societies, although American and animal families also are studied. The "nature versus nurture" question is addressed in its modern form, sociobiology versus learning theory. Same as Social Sciences 55M and 61Q.

31F Primate Societies (4). Surveys the lifeways of nonhuman primates. Topics include general characteristics of primates, their evolution, geographical distribution, ecology, and social relationships. Special emphasis is placed on the adaptive aspects of primate societies and their relevance for understanding humans and the nature of human societies.

31P Comparative Social Behavior (4). A comparative analysis of social behavior throughout the animal kingdom, emphasizing general theories of social behavior rather than the behavior of any particular species. The evolution of mating systems, parental behavior, altruism, and cooperation. Primate and human behavior presented as special cases of these general theories. Same as Social Sciences 61W.

31T The Rise of Civilization (4). Surveys of archaeological techniques and theories for the study of cultural evolution. Specific theories of the origins of the state and civilization. Sociopolitical structure of simple, egalitarian societies, and origins of complex society. Overview of the archeological database.

31W South Africa (4). Helps students understand current political events in South Africa. Uses South African events to explore classic issues in social and political theory. Focuses on underlying social and political processes at the grassroots level and on ordinary people struggling to make their own history through their day-to-day lives.

31Y Japanese Culture and Society (4). A study of Japanese culture in Japan and California with special focus on points of conflict or difference with Western values and behavior.

35A-B-C Ethnography I, II, III (4-4-4) F, W, S. Introductory topics in ethnography. Students may be required to make one or more field trips to Mexico at their own expense. Cost varies depending upon mode of travel and availability of outside funds for support.

Upper-Division Courses

Course modules emphasizing anthropology are assigned numbers from 130-139. NOTE: Students wishing to complete a module in the anthropology series may do so by taking any three upper-division anthropology courses.

131 Anthropological Theory

131A Kinship and Social Organization (4). Organization of social life primarily in preindustrial societies. Theories of kinship, marriage regulations, sexual behavior, and social roles. Comparisons of biological, psychological, sociological, and economic explanations of social organization.

131B Cross-Cultural Studies of Gender (4). An anthropological approach to the study of gender roles, sexual division of labor, marriage, and reproduction. Prerequisite: Social Sciences 2A or 2B. Same as Humanities 172F.

131E Economic Anthropology (4). Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world. Prerequisite: one course in general science, anthropology, economics, geography, or sociology. Same as Social Sciences 114L.

131F Ecological Anthropology (4). The study of relationships between human communities and their natural environments. The role of environment in shaping culture; the effects of extreme environments on human biology and social organization; and the anthropologists's role in studying global environmental problems such as African famine and the destruction of tropical rain forests. Prerequisite: Social Sciences 2A, 2B, or 2C.

131G Political Anthropology (4). Utilizes anthropological accounts of Western and non-Western societies to question conventional ways of thinking about power and politics. Classical traditions in political anthropology are critiqued; an alternative view is presented through recent anthropological political analyses of topics such as class, gender, aesthetics, and popular culture.

131H Urban Anthropology (4). Cultural roles of urban centers and processes or urbanization in comparative perspective, focusing on both nonwestern, nonindustrial societies of past and present; the relationship between modern urban centers and Third World peoples. Migration, urban poverty, adaption, and the social and political integration of rural folk in urban settings in Africa, Asia, and Latin America.

131J Alcohol, Society, and Humankind (4). Clinical, experimental, historical, and cross-cultural data are surveyed in the interest of understanding drunkenness and alcoholism as social phenomena. Same as Social Sciences 154E.

131L Adaptive Potential and Health (4). The theory of adaptive potential is part of a new field called "Health Anthropology." Description of the theory and its linkage to politics and ideology at the macro level of analysis and to health and individual well-being at the micro level. Studies of stress and coping, authoritarianism, Third World dominance, and general cultural dynamics.

131M Psychological Anthropology (4). Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, evolutionary models of culture and behavior, aspects of politically linked personality, cognitive anthropology, the psychology of narrative forms, and comparative national character studies. Prerequisite: Social Science 2A or 7.

131N Cognitive Anthropology (4). Focuses on individual and cultural differences and similarities in the categorization and organization of semantic structures. Relation of variations in these conceptual structures to other systems of behavior.

131P Philosophy of Culture (4). An introduction to philosophies of culture that have been formulated by philosophers, historians, anthropologists, and sociologists over the past four centuries. Intended to provide an understanding of the culture concept in order to study minority cultures in the United States. Same as Social Sciences 170B.

131R Witchcraft, Politics, and Knowledge (4). Readings on the witchcraft beliefs and practices among the Azande of Central

Africa, the witchcraze in 16th- and 17th-century Europe, in Salem, and in the Bocage in France today, form the basis for discussing theories of witchcraft, and more broadly, the social organization of how and what people "know."

131S Religion and Society (4). An examination of the relationship between belief systems and social structure, with case studies drawn from at least two Asian societies placed in a general comparative context.

131U-V Personality Theory in the Twentieth Century II, III (4-4) W, S. Focuses on the cultural, learning theory, and psychometric formulations of twentieth-century personality theory. Prerequisite: Social Sciences 7. Same as Social Sciences 154B-C.

131X-Y The Economics of Traditional Societies (4-4). 131X: Models and ethnographic descriptions of noncommodity exchange relations of the form that characterize intergroup and intragroup economic processes of many tribal societies. Includes analyses of gift exchange and exchanges within the household. **131Y:** Devoted entirely to supervised research by class members. Prerequisite: Social Sciences 12A-B-C; Social Sciences 114L or Social Sciences 131E recommended. Same as Social Sciences 114P-Q.

131Z Economic Development (4). Characteristics of underdeveloped economies. Theories of underdevelopment and development. Domestic and international policies for economic development. Prerequisite: Social Sciences 12A-B-C. Strongly recommended prior or concurrent courses: Social Sciences 11A-B-C or equivalent. Same as Social Sciences 111Z.

132A Chronological Dating Techniques in Environmental Reconstruction (4). Radiocarbon dating is a good example of a common technique which has wide application for a number of different fields. Surveys a number of dating techniques which can be used to establish a chronological framework. Particular emphasis on applications for environmental reconstruction. Same as Social Ecology E153.

132B Environmental Reconstruction (4). Applications of a number of scientific techniques used in environmental science are surveyed with reference to specific case studies. Students incorporate these techniques and sampling procedures into their research designs. Prerequisites: Social Ecology E8 and SE10 or equivalent; previous or concurrent enrollment in Social Sciences 132BL; consent of instructor; senior standing preferred. Same as Social Ecology E175.

132BL Laboratory for Environmental Science (4). Provides weekly lecture, lab experiments, and demonstration of techniques in the environmental sciences. Three to five Saturday field trips as well as a four-day field trip to study specific environmental problems. Prerequisite: previous or concurrent enrollment in Social Sciences 132B; senior standing preferred.

132C Ancient Civilizations of Mexico and the Southwest (4). The prehistory and cultural evolution of the civilizations which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state, political and social history, ancient cities, and the Spanish conquest.

134 Area Studies

134A People of the Pacific (4). The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia.

134C Castes and Tribes of India (4). An introductory survey of the range of social structures in South Asia; an undergraduate anthropology area studies course.

134D Hinduism: The Great Tradition (4). An introductory course to Hindu civilization and various aspects of Hinduism. Focuses on the Great Tradition from Vedic to modern times in India, looking not only at the religious content but at the social and economic system which supported and transmitted this tradition.

134E Women in Asia (4). Compares the changing position of rural and urban women in India, China, and other selected areas in Asia over time (primarily the twentieth century). Same as Humanities 172J.

134F African Societies (4). Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on ecological adaptations, social organizations, languages, and social change. Prerequisite: Social Sciences 2A.

134K Peoples and Cultures of Latin America (4). Examines the rise of state civilizations in pre-Columbian America, the colonial transformation of Indian society, and contemporary peoples and cultures. Topics include: ethnic and regional differences within national societies, social consequences of economic changes, and changing values and institutions.

134M Asians in California (4). An exploration of the demographic, economic, and social characteristics of major Asian immigrant groups which have settled in California since the mid-eighteenth century. The roughly chronological sequence moves from rural to urban communities, focusing on the roles of kinship, friendship, and ethnic networks in immigration and adaptation.

134N Japanese Culture in California (4). Field work and library research to explore problems and issues concerning Japanese immigrants and visitors in California. Topics include values, expectations, philosophy, religion, and psychology.

134Q Field Research: Asian Immigrants and Refugees in Orange County (4). Instruction in field work methodology via research projects involving the local communities of immigrants and refugees from Asia.

134R Rural Mexico (4). Social and economic life in rural Mexico: transformation of peasant economic life; influences of regional, national, and international political and economic forces; gender roles; sources of labor migration.

134S Korean Society and Culture (4). Provides introductory background to the social and cultural forces that affect the lives of the Koreans, with special reference to those in the United States. Considers traditional values and contemporary issues within a historical framework. Same as Social Sciences 162D.

135 Methods and Formal Representations

135B-C Techniques of Data Collection I, II (4-4) F, W. Basic methods and theories of proximity and preference data collection including pile-sort, ranking, triads, item-by-use matrices, rating, and free-listing. Multidimensional scaling, clustering, and quadratic assignment approaches are utilized. Extensive hands-on computer use. Prerequisite: Social Sciences 11A-B-C, 100A-B-C, or consent of instructor. Same as Social Sciences 101G-H.

135D Content Analysis and Text Semiotics (4). How to do various kinds of content analysis of folktales, novels, films, and thematic apperception tests. Learning how to do eidochonic analysis; score for achievement, power, and intimacy motives; segment texts; discovering text structures and semiotic codes; and extract ethnographic information from texts.

135E Ethnographic Journals: Descriptive Accounting of Experience (4). Course develops writing skills through descriptive accounting of personal experiences and activities in which students are participants and observers. Text editors are used to record these logs. Stresses achieving completeness of description, a professional writing style, and reduction of ambiguity in written text.

135F World Cultural Comparisons (4). Introduction to ethnology/ethnography, and comparative research and theory, culminating in processes of discovery and hypothesis testing using world cultural databases to which students can contribute. Open to lower-division students, particularly those who have completed Social Sciences 70C. Same as Social Sciences 172G.

135K Mind, Myth, and Television (4). A study of myth, folktales, modern literature, film and television, and how these expressive forms have shaped the direction of human development. Topics range from ancient rituals to modern ideology.

137 Special Seminars (4-4-4) F, W, S

137A Anthropological Major Seminar (4-4-4). A course in anthropological theory designed especially for majors in Anthropology. Different issues are considered in different years. Prerequisite: Anthropology major only or consent of instructor.

139A-Z Special Topics in Anthropology (4) F, W, S. May be repeated for credit. Prerequisites vary.

Department of Cognitive Sciences

The Department of Cognitive Sciences is committed to the investigation of the abstract, complex structures that underlie human cognition: language, thought, memory, learning, and perception. The main areas of research strength within the Department are theoretical linguistics, visual and auditory perception, experimental psychology, and mathematical psychology. The Department offers degree programs in Linguistics and Psychology.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree in Linguistics

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major

The undergraduate major in Linguistics is offered by the School of Social Sciences and the School of Humanities. These linguistics programs are administered by the Inter-School Linguistics Committee. Students are able to select a Linguistics major in either School according to their interests. Both Schools offer a minor in Linguistics.

There are two ways to major in Linguistics in the School of Social Sciences. They are designated as Tracks I and II. Track I, Theoretical and Formal Linguistics, will appeal to students interested in areas of cognitive science such as psychology and artificial intelligence. Track I may be taken through either the School of Social Sciences or the School of Humanities (see page 169). Track II, General Linguistics, is for students who wish to receive a broad introduction to the major subfields of linguistics. Track II may be taken through either the School of Social Sciences or the School of Humanities.

In addition, a third track, Applied Linguistics, is offered solely through the School of Humanities (see page 169).

Track I: Theoretical and Formal Linguistics

School requirements must be met and must include 14 courses (56 units) as specified below:

- A. Social Sciences 3
- B. Social Sciences 14A.
- C. Six upper-division courses with emphasis in linguistics: Social Sciences 141A, 141B, 141D, 141H, 141I, 142C.
- D. Six upper-division elective courses in linguistics chosen from: Social Sciences 141C, 141E, 141G, 142A, 142B, 142D, 142E, 142G, 144K, 144L, 149A, 151T, Information and Computer Science 162.

Track II: General Linguistics

School requirements must be met and must include 14 courses (56 units) as specified below:

- A. Social Sciences 3.
- B. Two upper-division courses in each of the following modules:
 - 1. Social Sciences 141A, 141B, 141C, 141D, 141E, 141F
 - 2. Social Sciences 141G, 141H, 141I
 - 3. Social Sciences 142 series
 - 4. Social Sciences 143 series
 - 5. Social Sciences 144 series

C. One year (three courses) in a single foreign language. Students are strongly urged to study a non-Indo-European language (such as Arabic, Chinese, Hebrew, Japanese, Swahili) whenever available.

Residency Requirement for the Linguistics Major: At least six upper-division courses required for the major must be completed successfully at UCI.

Linguistics Minor Requirements

Requirements for the minor in Linguistics are met by taking seven linguistics courses (28 units) as specified below:

A. Social Sciences 3, 141A, and 141H.

B. Four additional upper-division linguistics courses selected from the Social Sciences 141, 142, 143, and/or 144 series. Students are encouraged to refer to the program requirements for the tracks of the Linguistics major and to consult with the faculty before making their selection.

Residency Requirement: At least four upper-division courses required for the minor must be completed successfully at UCI.

Requirements for the Bachelor's Degree in Psychology

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major

School requirements must be met and must include 15 courses (60 units) as specified below:

A. Social Sciences 7

B. Two introductory courses (eight units) in the social sciences chosen from Social Sciences 2A or 2B, 3, 4, 6A, 6B, or 6C, 8A or 8C.

C. A one-quarter course in experimental psychology or research methods. (For 1989-90, this requirement may be satisfied by taking Social Sciences 51B, 151A and 151AL, or 151G and 151GL.)

D. Four upper-division psychology/linguistics core courses are required (16 units) with two courses from each of the following groups:

1. Social Sciences 142A, 151U, 153A, 153B

2. Social Sciences 153C, 154A, 155A, 156A

E. Seven additional courses (four or more units each) with emphasis in psychology, distributed as follows:

1. No more than three of the seven may be lower-division.

2. Three of the upper-division courses used to satisfy requirements D and E must be taken from one of the following modules: Social Sciences 141 and/or 142 combined, 151 and/or 153 combined, 154, 155, 156.

3. Certain courses offered in the School of Biological Sciences and the Program in Social Ecology may be used in partial satisfaction of this requirement. Such courses must be chosen from the approved list of psychology-related courses in these disciplines.

NOTE: Psychology majors are strongly encouraged to take Biological Sciences 79-80-81 in satisfaction of the natural sciences portion of the breadth requirement (Category II). Furthermore, it is strongly recommended that students who intend postbaccalaureate work in psychology take the sequence Social Sciences 151A-B-C or Social Sciences 151G and 153C. Some psychology graduate programs require calculus (which, at UCI, may be satisfied by taking Mathematics 2A-B-C).

Honors Program in Psychology: The honors program in Psychology is open to selected juniors who are majoring in psy-

chology. It provides basic training in research methods and culminates with the opportunity for basic research in some area of psychology under faculty supervision. The program has a limited number of openings and seeks to attract outstanding students who plan to undertake postgraduate education in some field of the psychological sciences. Admission to the program is based on a formal application that is normally submitted in the spring quarter of the sophomore year. Applicants should have an overall grade point of at least 3.2 and a grade point average of at least 3.5 in psychology courses, although this requirement may be waived in unusual cases.

During the junior year, students who participate in the program are expected to enroll in the honors section of Social Sciences 151A, B, and C, and in the fall quarter of the Honors Seminar in Psychology (H150A). As seniors, following successful completion of these junior-year requirements, psychology honors students are enrolled in the Honors Seminar in Psychology (H150A-B) in the fall and spring quarters, and in an independent study project (H199) the winter quarter. Participants in the honors program are expected to complete: (1) Biological Sciences 80 and 81, or suitable substitutes; (2) Social Sciences 153C; and (3) course work beyond the breadth requirement in one or more of the following areas: biological sciences, mathematics, computer science, physical science, linguistics, philosophy. The honors seminar may be used to satisfy two of the courses required by Part E of the Psychology major requirements. To graduate in the honors program, a student must successfully complete the requirements for the B.A. degree in Psychology with an overall grade point average of 3.2 and a grade point average of at least 3.5 in psychology courses. In addition, each student must successfully complete a senior honors thesis, as part of the senior-year course work.

Psychology Minor Requirements

Requirements for the minor in Psychology are met by taking seven psychology courses (28 units) as specified below:

A. Social Sciences 7.

B. Three upper-division psychology courses chosen from the following core courses in psychology: Social Sciences 142A, 151U, 153A, 153B, 153C, 154A, 155A, 156A.

C. Three additional psychology courses (four or more units each) chosen from Social Sciences 50-59, 142, 151-159.

D. In addition, the School mathematics and computer science requirement (School requirement A) must be satisfied.

Lower-Division Courses

3 Introduction to Cognitive Linguistics (4). Emphasis on the notion that language is a remarkable achievement of the human mind. Current insights into the nature of language. Survey of various subfields of linguistics. Introduction to linguistic analysis. Same as Linguistics 50.(V)

7 Introduction to Psychology (4) F, W, S, Summer. Weekly topics include human development, memory and problem solving, learning theory, perception, biological mechanisms, emotion and motivation, personality theory, social psychology, and behavior disorders. Students are expected to volunteer for participation in several ongoing laboratory experiments. (III)

14A Acquisition of Language (4). What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year olds. Comparison of kinds of data on which these theories are based. Same as Social Sciences 50A and Linguistics 40. (V)

14B Linguistics and Literary Theory (4). Explores relations between theoretical linguistics and literary theory, past, present, and potential. Structuralist approaches to language and literature, application

of Chomskian linguistics to literature, deconstructive critiques of linguistic and literary theory.

14C Language and the Mind (4). The relationship of knowledge of grammar to mental processes and mental representations. How linguistic behavior is rule governed.

49A-Z Special Topics in Linguistics (4). Special topics at lower-division level. Topics vary. May be repeated for credit when topic changes. Same as sections of Linguistics 80 as appropriate.

50A Acquisition of Language (4). What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year olds. Comparison of kinds of data on which these theories are based. Same as Linguistics 40 and Social Sciences 14A. (V)

50D Introduction to Social Psychology (4). Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction. Same as Social Sciences 61A.

50J Language and Society: Gender and Language (4). Recent sociolinguistic approaches to the expression of gender in language are scrutinized with a view to understanding how patriarchal social forms may be reflected in speech style, and how talk may be used to objectify persons sexually, reinforce sex roles, and encourage discrimination. Same as Social Sciences 19A and Linguistics 60.

50K Principles of Applied Psychology (4). Introduction to the understanding of human functioning through cognitive and behavioral approaches. Learning is applied to common problems students face. Students will put into practice these principles in the management of their own behavior.

50R Introduction to Semiotics (4). How humans and other animals communicate with each other by means of symbols and other signs. "Body Language"; the symbols of everyday life, of movies and literature, of religion and society. Symbolic systems and symbolic evolution. Same as Linguistics 13A.

50T Introduction to Human Memory (4). Covers the core concepts of modern research and theorizing about human behavioral memory, including structural subdivisions (e.g., perceptual memory, short-term memory, long-term memory), different measures of memory (e.g., recall, recognition), and some practical applications of memory research (e.g., mnemonics). (III)

50U Writing Systems and Written Language (4). Ancient and modern writing systems, ranging from Sumerian pictographs through Egyptian and Mayan hieroglyphs to the Phoenician alphabet and its modern descendants (including our own). Distinctive traits of written language (what can be written that cannot be said?), and issues distinguishing hand-execution from eye-recognition.

51A Issues and Practice in Experimental Psychology (4). Discussion and analysis of problems involved in doing experiments and in drawing conclusions. For students who might consider a research career in the social sciences, particularly psychology, and also for students who want to learn about the purposes and methods of research. Focus on questions such as "How are hypotheses developed and tested?" and "What problems arise in designing experiments and in collecting and interpreting data?" (III)

51B Introduction to Experimental Psychology (4). Explores the application of scientific research methods to the study of psychology. The development of testable hypotheses, the design of experiments that test a hypothesis adequately, the collection of experimental data, and the interpretation of results. Prerequisite: Social Sciences 7. (This course satisfies the psychology laboratory requirements.)

55C Adolescent Psychology (4). Focus on the psychosocial dynamics of today's adolescent in America in terms of the ongoing quest for identity, independence, values, and sexual preference. Analysis of the power struggle and conflict between the adolescent and adult worlds as manifested in the family, school, and other institutions; new choices and new conflicts for the adolescent female; special needs of the culturally different adolescent; and strategies for helping the distressed and troubled adolescent. Prerequisite: Social Sciences 7. (III)

55E Psychology and the Family (4). Examines theories, research, implications, and applications of psychology as they relate to the

understanding of family structure, process, development, and change.

55M Anthropology of the Family (4). Examination of the family by comparison of the various forms of intimate social organizations in the world. Emphasis on families in non-Western societies although American and animal families are also studied. The "nature versus nurture" question is addressed in its modern form, sociobiology versus learning theory. Same as Social Sciences 31A and 61Q.

55N Primate Societies (4). Surveys the lifeways of nonhuman primates. Topics include general characteristics of primates, their evolution, geographical distribution, ecology, and social relationships. Special emphasis is placed on the adaptive aspects of primate societies and their relevance for understanding humans and the nature of human societies. Same as Social Sciences 31F.

58A Social Psychology of Higher Education (4). Focuses on issues and concerns unique to freshmen enrolled at a major research institution. Theoretical framework for understanding the role of higher education in today's society. The field of research and inquiry from a social/psychological perspective. Influence of higher education on social and psychological development of American students. Develops critical understanding of key issues. Restricted to lower-division students only.

Upper-Division Courses

Course modules emphasizing cognitive linguistics are assigned numbers from 140-148. NOTE: Students wishing to complete a module in the cognitive linguistics series may do so by taking any three upper-division cognitive linguistics courses.

Course modules emphasizing individual or small group behavior are assigned numbers from 150-158.

141 Linguistic Theory

141A Introduction to Syntax (4). Linguistic intuition, well-formedness, constituent structure, transformation, derivation, argument, and counter-example. Emphasis on English syntax and what characterizes a linguistically significant generalization. Prerequisite: Social Sciences 3 or Linguistics 50. Same as Linguistics 120. (V)

141B Advanced Syntax (4). Further topics in English syntax and theory of grammar. Constraints on what linguistic rules can do. The relationship between linguistic theory and language learning. Prerequisite: Social Sciences 141A or Linguistics 120. Same as Linguistics 122.

141C Current Topics in Syntactic Theory (4). A small number of well-defined topics is pursued intensively, with particular emphasis on recent articles that have had significant impact on the development of the theory of syntax. Prerequisite: Social Sciences 141B or Linguistics 122. Same as Linguistics 124.

141D Semantics (4). Analysis of various proposals for the treatment of semantics in an integrated linguistic theory. The boundary between syntax and semantics. Coreference phenomena. Contributions from philosophy of language. Prerequisite: Social Sciences 141A or Linguistics 120 or consent of instructor. Same as Linguistics 126.

141E Pragmatics (4). The study in linguistic theory of the use of language by speakers as a tool for communication in context. Prerequisite: Social Sciences 141A or Linguistics 120. Same as Linguistics 128.

141F Structures of Non-Indo-European Languages (4). Nontechnical analysis of essential grammatical aspects of selected non-Indo-European languages. Comparison and contrast with aspects of the grammars of more familiar Indo-European languages (e.g., English and French) are emphasized. Prerequisites: Social Sciences 3 or Linguistics 50. Same as Linguistics 125.

141G Morphology and the Lexicon (4). Study of the lexical representation of words; its relations to phonology, morphology, and syntax, with special emphasis on recent developments in the theories of morphology and syntax. Prerequisites: Linguistics 110 and 120, or equivalent. Same as Linguistics 114.

141H Phonetics, Phonology, and Morphology (4). General phonetics with emphasis on articulatory phonetics, including practice in phonetic transcription. Phonological and morphological analysis of data from a wide variety of languages. Prerequisite: Linguistics 50 or equivalent. Same as Linguistics 110. (V)

141I Advanced Phonology and Morphology (4). Phonological and morphological theories illustrated by analysis of data from a wide variety of languages. Prerequisite: Social Sciences 141H or Linguistics 110. Same as Linguistics 112.

142 Psycholinguistics

142A Linguistic Theories as Psychological Theories (4). Examines the claim that a central foundational tenet of contemporary linguistics is that linguistic theories are a type of psychological theory pertaining to the nature of human knowledge and language. Critical discussion from linguistic, psychological, and philosophical perspectives. Prerequisites: Social Sciences 3 and 7. Same as Linguistics 135.

142B Project in Child Language (4). Seminar, three hours. Begins with an intensive review of previous work on child language in which problems and methodology are discussed; projects specified. Remainder devoted to the projects and to discussing the problems and results which arise from doing them. Prerequisite: Social Sciences 50A or consent of instructor. Same as Social Sciences 156E and Linguistics 141.

142C Introduction to Psycholinguistics (4). Lecture, three hours. Study of a particular topic in the psychology of language with particular emphasis on syntax and semantics. Same as Linguistics 142.

142D Language and the Brain (4). Analysis of current research on the biological bases of human linguistic capacity. Topics include development, focusing on hemispheric specialization and plasticity; the localization of specific linguistic functions in adults, with an emphasis on the study of aphasia; the relation of linguistic capacity to general cognitive capacity, considering especially research on retardation. Prerequisites: Biological Sciences 80 and 81 or Biological Sciences 105 or consent of instructor. Same as Biological Sciences 160 and Linguistics 144.

142E Readings in Child Language (4). In-depth reading and discussion of recent works in language acquisition. Concentration on relating research to contemporary linguistic theory. Prerequisite: Social Sciences 50A or Linguistics 40. Same as Linguistics 143.

142G Theories of Second Language Acquisition (4). Research in the acquisition and learning of second and foreign languages. The influence of language acquisition theory on past and current teaching methodology. A comparison of first- and second-language acquisition. Prerequisite: Social Sciences 3 or Linguistics 50. Recommended: Social Sciences 50A or Linguistics 40. Same as Linguistics 140.

143 Historical Linguistics

143A Historical Linguistics (4). Methods of historical analysis of language. Classification of languages and aspects of language change by internal reconstruction and the comparative method. Prerequisite: Social Sciences 3 or Linguistics 50. Recommended: Linguistics 110 or Social Sciences 141H. Same as Linguistics 130.

143B History of English (4). External (historical and social) and internal (linguistic) changes which have affected the English language from its Germanic roots to the present day. Prerequisite: Linguistics 50 or equivalent recommended. Same as Linguistics 132 and English and Comparative Literature 184.

143C Indian Language of the Americas (4). Survey of Indian languages illustrating sound systems and structures. Linguistic affinities between North and South American languages. Prerequisite: Social Sciences 3 or Linguistics 50. Same as Linguistics 133.

143D History of Linguistics (4). Course requires at least 4,000 words of assigned composition based upon readings related to the history of linguistics. Linguistics majors are given admission priority. Prerequisites: satisfaction of lower-division writing requirement; junior status, or consent of instructor. Same as Linguistics 139.

144 Sociolinguistics

144A Sociolinguistics (4). Sociolinguistic varieties of language examined from different geographical, temporal, and cultural points of view. Prerequisite: Social Sciences 3 or Linguistics 50. Same as Linguistics 150.

144B American Dialects (4). Variability theory as applied to research in American dialects, especially phonological variation and sound change in progress. Prerequisite: Social Sciences 3, Linguistics 50, or equivalent. Recommended: Social Sciences 141H or Linguistics 110. Same as Linguistics 152.

144C Paralanguage and Kinesics (4). Channels of nonverbal communication which correlate with speech. Extra-speech sounds and body movements. Recommended: Social Sciences 3 or Linguistics 50. Same as Linguistics 154.

144J Foundations of Communication (4). The logical and semiotic foundations of communication and signification. Same as Social Sciences 157E.

144K Introduction to Cognitive Semiotics (4). Symbols and their webs. The foundation course in cognitive semiotics, comprising an introduction both from the philosophical standpoint represented by Peirce and from the linguistic standpoint represented by Dalgarno and Saussure. Current cognitive developments are studied. Same as Social Sciences 157A.

144L Cognitive Iconics (4). The study of writing systems (alphabets, runes, Mayan and Egyptian hieroglyphics), and in particular of their evolution and modern changes introduced spontaneously through "mistakes," with a view toward exploring aspects of the human mind. Same as Social Sciences 157B.

149A-Z Special Topics in Linguistics (4) F, W, S. May be repeated for credit. Prerequisites vary.

150 Honors in Psychology

H150A-B Honors Seminar in Psychology I, II (4-4). Focuses on the research activities, including the honors thesis research projects, of each student, and on the research of various psychology faculty. Students discuss their research interests in the early as well as the later stages of their projects. Research projects and project write-ups are required. Prerequisite: open only to students in the Honors Program in Psychology.

151 Experimental Psychology

151A Experimental Psychology (4) F. Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections. Prerequisites: Social Sciences 7 and either Social Sciences 11A-B-C, Social Sciences 100A-B-C, or Mathematics 2A-B-C.

151LA Experimental Psychology Laboratory (2) F. Corequisite: concurrent enrollment in Social Sciences 151A.

151B Advanced Experimental Psychology (4) W. Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research. Prerequisite: Social Sciences 151A.

151LB Advanced Experimental Psychology Laboratory (2) W. Corequisite: concurrent enrollment in Social Sciences 151B.

151C Research in Experimental Psychology (4) S. Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter. Prerequisite: Social Sciences 151B.

151D Advanced Topics in Visual Perception (4). Topics in vision related to ophthalmology and optometry. A course for students considering a career in eye care. Prerequisite: Social Sciences 151U or consent of instructor.

151E Introduction to Psychological Tests and Measurements (4). Principles of psychological measurement, including psychometrics, test theory, and the measurement of abilities, attitudes, traits, and interests. Reliability and validity of psychological measurements. Prerequisites: Social Sciences 7 and 11A-B-C or equivalent.

151F Motivation (4). Factors affecting the behavioral performance of organisms. A survey of theoretical and empirical approaches to the physiological, psychological, and social factors which generate behavior. Prerequisite: Social Sciences 7.

151G Observational Research Methods in Psychology (4). Introduction to research methods in social psychology, with emphasis on observational studies. Each student is given the opportunity to propose, carry out, analyze, and report a piece of original social psychology research. Corequisite: Social Sciences 151GL. Prerequisite: Social Sciences 7, upper-division standing. An introductory course in statistics is recommended.

151GL Observational Research Methods in Psychology Laboratory (2). Corequisite: Social Sciences 151G.

151J Introduction to Scaling (4). Procedures to quantify sensation, preference, ability, and attitude are explained (unidimensional scaling), with applications to various problems in psychology and some problems in industry and marketing. Prerequisite: Mathematics 2A or equivalent. Not offered 1989-90.

151K Visual Attention Research (2). Review and discussion of current research on the role of attention in the perception of visual patterns. Experiments are designed, run, and analyzed. Students have the option of participating as subjects or writing a term paper. Prerequisites: Social Sciences 7 and consent of instructor.

151L Computers and Psychology (4). Introduction to computer applications in applied and research psychology, including automated psychological assessment, diagnosis, prescription development, experimental stimulus presentation, and data analysis. Potential future developments, including artificial intelligence applications and "expert systems" are discussed.

151N Introduction to Color Science (4). How to specify colors (colorimetry), how to systematize colors (color system), what cognitive processes underlie perception, and naming of colors are discussed. Examples are taken not only from experimental psychology, but also from color TV and photography. Color harmony and aesthetic aspects of color are not covered. Prerequisite: Social Sciences 7 or consent of instructor.

151O Gender in Biological Perspective (4). Behavioral and biological differences between the sexes, both in humans and in animal models. Neural and hormonal gender differences and gender differences in cognition and behavior, considered from a developmental perspective as well as in adulthood. Evidence and theories regarding the existence of these differences and their presumed biological bases. Prerequisites: Social Sciences 7 and Biological Sciences 80 and 81, or consent of instructor.

151R Psychophysical Methods and Models (4). Experimental and theoretical methods used in the study of vision, with special emphasis on signal detection theory and linear systems analysis. Intended for students who plan to pursue graduate training in fields related to visual science; familiarity with elementary probability is assumed. Some knowledge of calculus is helpful. Prerequisite: Social Sciences 151U. Not offered 1989-90.

151T Introduction to Auditory Perception (4). An introduction to the scientific study of hearing. Prerequisite: Social Sciences 7 or consent of instructor.

151U Sensation and Perception (4). Lecture, three hours. A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis on the visual system. Prerequisite: Social Sciences 7.

151V Advanced Sensation and Perception (4). A continuation of Social Sciences 151U. In-depth study of selected topics, emphasizing the way questions in sensory research are formulated and pursued. Prerequisite: Social Sciences 151U.

153 Learning and Cognition

153A Cognitive Science (4). Introduction to investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include: perception, attention, knowledge representations, learning and memory, action, reasoning, and language. Prerequisite: Social Sciences 7.

153B Learning Theory (4). Investigation of the learning and memory processes of humans and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed. Prerequisite: Social Sciences 7.

153C History of Psychology (4). A history of the development of various schools and systems of psychological thought. Prerequisite: Social Sciences 7.

153D Learning and Memory (4). Basic issues concerning the nature of behavioral plasticity and information storage and their neural substrates. Prerequisite: Biological Sciences 105 or consent of instructor. Same as Biological Sciences 158.

153E Human Problem Solving (4). Modern developments in the psychology of human problem solving. Among the topics considered: concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, chess, and theorem proving. Prerequisites: Social Sciences 7 and upper-division standing.

153F Human Memory (4). Developments in the area of memory; the history of memory research as well as theories of the nature of memory. Visual memory, recognition memory, high speed scanning, free recall, short-term memory, mnemonics, retrieval, and the relationship of memory to thinking. Selected theoretical formulations for memory. Prerequisites: Social Sciences 7, Social Sciences 11A-B, or consent of instructor.

153G Human Memory Disorders (4). Focuses on models and methods of assessing human memory and its disorders. Exposure to conventional and new assessment devices provided.

153H Human Neuropsychology (4). Disorders of human brain functions are used to illustrate basic issues and findings in the study of brain and behavior. Topics include development and aging, perception and action, language, laterality, learning and memory, spatial behavior, psychopathology. Prerequisites: Biological Sciences 80 and 81 or equivalent, or consent of instructor.

153I Comparative Psychology (4). How various species solve problems such as finding food and water, reproducing, and avoiding predators. Emphasizes the psychological processes which have evolved as part of the organism's adaptation to its environment. Implications of an evolutionary approach to psychology are stressed, especially those relevant to understanding human behavior. Prerequisite: Social Sciences 7.

153J Human Factors in Information Processing (4). A survey of design and environmental factors that determine effective human transfer of information. Not offered 1989-90.

153L Machine and Human Vision (4). By trying to make computers see, one discovers many problems the human visual system must solve. Problems discussed include edge detection, stereopsis, object recognition, motion analysis, and color. Prerequisite: Social Sciences 7, Mathematics 2A, or equivalent.

153R Psychology of Reading (4). Surveys the major components of skilled reading and the determinants of successful reading acquisition. Examination of contemporary models of skilled reading. Focuses on models of the development of reading skill. Research on the causes of developmental dyslexia. Prerequisite: Social Sciences 7.

153S The Psychology of Chess (4). Reviews recent psychological literature on chess; gives chess demonstrations. The psychoanalysis of chess players, artificial intelligence, chess programs, the relationship of eye movements to chess thinking, perception and memory of the chess master, blindfold chess playing, and the relationship of chess thinking to more general problem solving. Students should know chess. Prerequisite: consent of instructor.

154 Personality and Social Psychology

154A Personality Theory in the Twentieth Century I (4). A survey of the evolution of personality theory during this century. An overview of major perspectives in the field, with special attention to Freud, Jung, and Adler. Prerequisite: Social Sciences 7.

154B-C Personality Theory in the Twentieth Century II, III (4-4). Focuses on the cultural, learning theory, and psychometric formulations of twentieth-century personality theory. Prerequisite: Social Sciences 7. Same as Social Sciences 131U-V.

154D Psycho-Social Theories of Politics (4). Focus on recent attempts to make sense of the relation between the individual and society. Same as Social Sciences 125T.

154E Alcohol, Society, and Humankind (4). Clinical, experimental, historical, and cross-cultural data are surveyed in the interest

of understanding drunkenness and alcoholism as social phenomena. Prerequisite: Social Sciences 7. Same as Social Sciences 131J.

154F Social Cognition (4). Examination of how people understand themselves and others. Topics include causal attribution, person perception, and moral reasoning. Review draws on research done by social and developmental psychologists. Same as Social Sciences 126J.

154G Games as Models of Social Phenomena (4). Games as analogies of social, economic, and political situations. The interaction of contingency plans. Games (situations) with no winner and/or loser. Technical definition and discussion of conflict, threat, stability. Paradoxes involved in defining "rational decision." Prerequisite: one year of college-level mathematics. Same as Social Sciences 161M.

154H Political Psychology (4). Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, the process of political decision-making, and the nature of political leadership. Same as Social Sciences 126H.

154M Models of Collective Decision Making (4). Introduction to formal models of social choice, with emphases on the theory of committees and elections; economic models of social interaction, game theory, and coalition behavior; and judgmental accuracy of group decision making. Prerequisite: Social Sciences 12A-B-C. Same as Social Sciences 112F and 126L.

154Q Social Psychology of Networks (4). Review of network models used in small group and organizational research. Discussion of social psychological literature relevant to the network study of cognitive social structure, exchange and communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues. Same as Social Sciences 162R.

154R Asian-American Psychology (4). Examines the social and psychological concerns of Asian-Americans, e.g., coping with racial prejudice, maintaining bicultural identities, dealing with cross-cultural conflicts in interracial relationships, and trying to reconcile generational differences between immigrant parents and their American-born children.

154S Introduction to Organizational Industrial Psychology (4). Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research and consumer psychology. Potential ethical problems are discussed.

155 Clinical Psychology and Personal Adjustment

155A Abnormal Psychology (4). Lecture, three hours. Introduction to psychopathology and behavioral deviations, and the concepts and theories regarding these conditions. Prerequisite: Social Sciences 7.

155B Deviance (4). Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Social Sciences 161F and Social Ecology J133.

155C Counseling Theory I (4). Theoretical approaches and related counseling techniques examined, including client-centered, rational-emotive, transactional analysis, Alderian, Gestalt, and behavioral counseling. Beginning relationship skills practiced in a laboratory section, using film and audio tapes. Same as Social Ecology S101A.

155F Psychology of Dreams (4). Psychological literature on the brain and chemistry of the dreamer is reviewed. The content of dreams is examined through the psychoanalytic tradition of Jung, Freud, and others, as well as through other psychological traditions and mythology and literature. Current research on dreams is included.

155G Delusional Thought (4). Lecture, two hours; discussion, one hour. Various types of delusional thought from other cultures and our own are analyzed with respect to how they interrelate with the everyday life of the believers of the delusions.

155H Models of Addiction (4). Review of medical, psychological, sociological, moral, behavioral, personality, and other models of the addiction process and its treatment. A variety of common addictive behaviors are considered, including alcoholism, drug addiction, gambling, work, and smoking.

155S Introduction to Clinical Psychology (4). Overview of theories, techniques, and research methodologies in counseling and clinical psychology. Behavioral, cognitive, psychodynamic, psychoanalytical, rational-emotive, and multimodal approaches are examined. Lectures supplemented by group discussions and demonstrations. Prerequisites: Social Sciences 7 and upper-division standing.

155T Psychopathology and the Occult (4). Lecture, three hours. A study of the psychopathological dimensions of witchcraft, demonology, cults, and beliefs unsupported by evidence or number of adherents. The embodiment of these themes in literature and film is considered. Not offered 1989-90.

155V Cognitive Disorders (4). Advanced treatment of the neuropsychology of language and cognition by reference to current research into the nature of acquired cognitive disorders, including aphasia, amnesia, and visuospatial impairments. Relationships between the cognitive consequences of known brain damage and the cognitive profile of specific developmental disorders. Prerequisite: Social Sciences 7.

155X-Y-Z Psychopathology I, II, III (4-4-4). Examination of psychopathology from both experimental and theoretical perspectives. Topics include theories of the unconscious, dissociative thinking, hypnosis, hysteria, and thought impairments produced by major affective disorders. Prerequisite: Social Sciences 155A.

156 Developmental Psychology

156A Developmental Psychology (4). A general introduction to the study of the physical, intellectual, social, and emotional development of the child from birth to adulthood. Prerequisite: Social Sciences 7.

156B-C-D Creative Learning in Children (4-4-4) F, W, S. Seminar, two hours; field work, six hours. Students assist in teaching children at the Farm School, recording and studying their interactions with the children, and developing materials for use in the School. The Farm School is ungraded; the children range in age from five to 12. Students in any major are eligible for the course.

156E Project in Child Language (4). Begins with an intensive review of previous work on child language in which problems and methodology are discussed and projects are specified. Remainder devoted to the projects and discussing the problems and results which arise from doing them. Prerequisite: Social Sciences 50A or consent of instructor. Same as Social Sciences 142B and Linguistics 141.

156G Moral Development Over the Life Span (4). An introduction to moral reasoning and behavior in children, adolescents, and adults. Same as Social Ecology S149. Not offered 1989-90.

156H Cognitive Development (4). An analysis of intellectual development from birth through maturity. Mechanisms of cognitive growth from Piagetian and current information processing theories are examined. Recent research on developmental changes in concept formation, knowledge structures, memory skills, and problem solving strategies is presented. Prerequisites: Social Sciences 156A and upper-division standing.

156L Developmental Neuropsychology (4). The development of brain and behavioral changes in the first decade of life. Consideration of both the behavior of normal and developmentally disabled children. An individual project involving observation of child behavior is required as is one involving library research on a topic of current interest. Prerequisites: Social Sciences 7, Biological Sciences 79 and 80. Not offered 1989-90.

156M Perceptual Development (4). Human perceptual development is examined from birth through childhood with emphasis on localization, discrimination, and pattern recognition abilities in vision and audition. The role of perceptual development in cognition is evaluated. Prerequisite: Social Sciences 151U is highly recommended.

156N Psychological Anthropology (4). Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics; biocultural aspects of child development and attachment; evolutionary models of culture and behavior; aspects of politically linked personality; cognitive anthropology; psychology of narrative forms; and comparative national character studies. Prerequisite: Social Sciences 2A or 7. Same as Social Sciences 131M.

156P-Q-R Attention and Learning Deficits in Children I, II, III (4-4-4). Learning in normal and attention-deficit-disordered children. Covers the normal developmental course of learning and a variety of deficits. Includes field work with attention-deficit-disordered children. Prerequisite: consent of instructor.

157 Cognitive Semiotics

157A Introduction to Cognitive Semiotics (4). Symbols and their webs. The foundation course in cognitive semiotics, comprising an introduction both from the philosophical standpoint represented by Peirce and from the linguistic standpoint represented by Dalgarno and Saussure. Current cognitive developments are studied. Same as Social Sciences 144K.

157B Cognitive Iconics (4). The study of writing systems (alphabets, runes, Mayan and Egyptian hieroglyphics), and in particular of their evolution and modern changes introduced spontaneously through "mistakes," with a view toward exploring aspects of the human mind. Same as Social Sciences 144L.

157C Semiotics II (4). The history of semiotics from the Greek and Roman Stoics through early Patristic writings to the search for the "real character" during the seventeenth century. A knowledge of Greek and/or Latin is desirable. Prerequisite: consent of instructor.

157D Semiotics III (4). Semiotic thought from Peirce to the present. Modern developments, especially "animal talk" and other controversies. Semiotic evolution. Prerequisites: Social Sciences 157B and 157C.

157E Foundations of Communication (4). The logical and semiotic foundations of communication and signification. Same as Social Sciences 144J.

157T Special Topics in Semiotics (4). Focuses on topics selected from the semiotic domain broadly considered. Prerequisite: Social Sciences 157A, 157B, or consent of instructor.

159A-Z Special Topics in Psychology (4) F, W, S. May be repeated for credit. Prerequisites vary.

Program in Comparative Culture

The course of study in Comparative Culture concentrates upon the main minority groups of the United States in a comparative framework. What experiences historical, cultural, and social do Afro-Americans, Asian-Americans, Chicanos, and Native Americans share in common? How are their experiences related to the larger culture and society of the United States? In order to explore such questions, students become engaged in interdisciplinary study, using the concepts and methods of anthropology, art history, history, literary criticism, political economy, psychology, and sociology.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 211.

Program Requirements for the Major

School requirements must be met and must include 15 courses (60 units) as specified below:

A. Two introductory social science courses (eight units), chosen from Social Sciences 1-8.

B. Social Sciences 70A, 70B, 70C.

C. Social Sciences 170A, 170B, plus three courses (12 units) selected from one or a combination of the following modules: Social Sciences 170; 171; 172.

D. Three courses (12 units) selected from Social Sciences 172.

E. Two courses (8 units) designated as Social Sciences 179 (Special Topics) or approved courses.

Students also are encouraged to take related courses outside the School of Social Sciences if such courses are appropriate to their educational goals.

Comparative Culture Minor Requirements

Requirements for the minor in Comparative Culture are met by taking seven courses (28 units) as specified below:

A. One course chosen from the Social Sciences 70A, 70B, 70C series.

B. Six courses chosen from Social Sciences 170, 171, 172, 179 (no more than two from the 179 series).

C. While students will be responsible for designing the minor according to the above guidelines, the curriculum for the minor should be planned in consultation with Comparative Culture faculty. Curricula must receive prior approval from one faculty member in the program as well as the Director of the Program in Comparative Culture.

Lower-Division Courses

70A Introduction to Minority Cultures in American Society (4). A survey of the main minority cultures in the United States, comparing their histories, evolution, and cultural individuality. Emphasis on the cultural variation in the United States as well as the processes and changes, historical and current, within cultural communities. (III)

70B Introduction to Expressive Forms in American Society (4). A survey of the expressive forms of minority cultural groups in the United States. Literature, music, visual art, ritual, and folklore are studied, with an emphasis upon understanding their relationship to their social and cultural contexts. (III)

70C Comparing Cultures (4). Introduces students to the scope of cross-cultural comparisons by analyzing the theories, methodologies, and facts used by selected anthropologists, sociologists, social psychologists, political scientists, and historians in comparing cultures. (III)

70T The Image of Minorities in American Films (4). An examination of the cultural content of American motion pictures as it applies to the resident minority groups in the United States. Films projecting an image of Blacks, Asians, American Indians, Chicanos, and Africans screened.

70X The Motion Picture in Contemporary American Society (4). A brief history of the commercial motion picture's social and economic development; how and by whom theatrical films are made; the motives, machinations, and techniques of filmmakers in the creation, distribution, and promotion of commercial motion pictures; the contributions and special problems of the various types of people involved in modern filmmaking.

72C-D Jazz: Its Anatomy, History, and Sociology (4-4). The nature of jazz as an art form, its historical development, and its sociocultural origins and impact. **72C:** The roots and early development of jazz from ragtime and the blues through Dixieland and the swing era. **72D:** The bop revolution and subsequent stylistic innovations such as "cool," "funk," "avant-garde," "the third stream," and "fusion." Prerequisites: ability to read music and/or understanding of common musical usages and notations.

74A History of the Documentary Motion Picture (4). Documentary films from their prenatal stirrings in 1874 to the present. Films screened trace the evolution of documentary techniques, styles of leading documentarists, and the importance of the documentary film in the American motion picture industry. Students with special interest in documentary film production, writing, distribution, and

criticism may develop field projects that give them an opportunity to see their area of interest in operation.

Upper-Division Courses

Course modules emphasizing Comparative Culture are assigned numbers from 170-178.

170 Disciplines and Culture Study

170A Scope and Problems of Interdisciplinary Studies (4). An exploration of the problems of interdisciplinary scholarship and the interrelationship among social science and humanities disciplines. Empirically, the course focuses on the American Puritans.

170B Philosophy of Culture (4). An introduction to philosophies of culture that have been formulated by philosophers, historians, anthropologists, and sociologists over the past four centuries. Intended to provide an understanding of the culture concept in order to study minority cultures in the United States. Same as Social Sciences 131P.

170C Economics and Culture (4). Survey introduction to economic issues, ideas, and institutions. Relationships among production, distribution, consumption, and ownership and their impact upon culture. The works of major economists such as Malthus, Marx, and Veblen are used to discuss the relationship between economics and ideology. Comparative economic systems and the relative economic condition of ethnic and socioeconomic groups in the U.S. are discussed.

170D Politics and Culture (4). An introductory examination of the factors affecting the formation and structure of political/labor movements among race/ethnic groups in the U.S. Relationship of domestic movements to international developments will also be analyzed.

170E Society and Culture (4). An introduction to the processes underlying stratification in American society with emphasis on race/ethnic and class divisions. These processes also are examined in relationship to the works of major theorists such as Marx, Weber, and Durkheim.

170F History and Culture (4). An introduction to ethnohistory, focusing on the contributions of history to the interdisciplinary study of sociocultural systems. Empirical focus on the slave South, with intensive analysis of major secondary sources.

171 Expressive Forms of Culture

171A Cultural Analysis of Literature (4). How the literature of minority American cultures can be studied as a cultural document. Focus on how culture affects creation of literature.

171B Folklore and Popular Culture (4). A survey of forms of folklore and their relationships to popular culture and to social and cultural analysis.

171C Comparative American Folklore (4). A study of major genres of folk expression in American history, focusing on how folklore contributes to an understanding of American culture. Attention is given to the songs, folktales, and folklife of various American groups.

171D Religion and Culture (4). A survey of the major issues in the comparative study of religious beliefs and behavior of minority American cultures.

171F Cultural Analysis of Visual Arts (4). Explores the relationships between the visual arts and the culture and society of which they are a part. The works of nonliterate societies as well as those of the Western world are analyzed and compared.

171G Language and Culture (4). A lecture and discussion course in the nature of language, its spoken and written forms, and its relation to thought and other forms of human culture: the verbalization of morality, values, religion, aesthetics, and politics; problems in the interpretation of ideological works in ancient and recent times; semantics and psychology of speech, image, gesture, and onomatopoeia as communication beyond the dictionary.

171K-L-M Gospel Choir I, II, III (2-2-2). A study of the music of Afro-American spirituals and gospels. Approach is one of cultural authenticity rather than "musically straight." Course includes historical and cultural aspects of this form of music. Several performances are given throughout the year. Participation is by audition. May be repeated for credit.

171T-U-V Television and Culture I, II, III (4-4-4). Examines the relationships between television and culture, and the structure of the television industry and its relationship to other American social institutions. Concentrates on methods of analyzing various television genres, from situation comedies, game shows, and soap operas to documentaries and news. Videotapes, selected readings, and a paper are required.

172 World Cultures

172A American Culture (4). A survey of the historical development of dominant American society and culture. Aims to identify dominant social values and to explore their implications for the development of American society.

172B Afro-American Culture (4). A survey of the development of Afro-American culture with a focus on the United States. Topics include African and New World sources and contemporary forms of Afro-American social and cultural life.

172C Asian-American Culture (4). A survey course of socio-political-economic dimensions of Asian-American people—their past, present, and future.

172D Chicano Culture (4). A critical survey of social science literature on the Chicano experience and a general discussion of the various models and theories applied by social scientists to the study of oppressed national minorities. Discussion of race and class within the context of the Chicano experience.

172E Native American Culture (4). An introduction to the history, evolution, ecology, and culture areas of North American Indians. Describes how Native Americans once were and why they were that way. A brief introduction to contemporary Native American culture is provided.

172F Latin American Culture (4). A study of political, social, economic, and intellectual forces in Latin America. Major topics include Latin American thought; social stability and instability, including revolutionary change; changing Latin American cultures.

172G World Cultural Comparisons (4). Lecture, three hours. Introduction to ethnology/ethnography, and comparative research and theory, culminating in processes of discovery and hypothesis testing using world cultural databases to which students can contribute. Open to lower-division students, particularly those who have completed Social Sciences 70C. Same as Social Sciences 135F.

173A Adolescent Psychology in Urban American Society (4). The psychosocial dynamics of today's adolescents in American society in terms of their ongoing quest for identity, independence, values, moral and cognitive development, peer group relationships, sexuality and sex role preference. Analysis of the power struggle between adolescent subcultures and the institutions of the dominant society.

173B Adolescent Psychological Disorders (4). Examines within a developmental framework how the predictable internal and external conflicts of adolescents and young adulthood involving self, family, and society can become intensified until a breakdown in usual coping pattern occurs. Specific syndromes indicative of increased stress in adolescence as well as major psychological, social, and psychiatric treatment approaches will be discussed. Restrictions: senior standing; Psychology or Social Ecology major; one previous course in adolescent psychology.

179 Special Topics (4-4-4) F, W, S. Special topics courses are offered from time to time, but not on a regular basis. These courses probe a single ethnic group or culture, or take up a special cultural problem or an aspect of culture for consideration. Possible subject matters are Film and Visual Arts; Comparative American History Through Literature; American Autobiography; American Ideologies; Comparative Ethnic Politics; Chicano Historical Experience; Afro-American History; History of Education in America.

197A-B-C Field Study in the Chicano Community (4-4-4) F, W, S. Emphasis on applied bicultural education in the Barrio. Students participate in classroom situations with Chicano elementary school students. Prerequisite: consent of instructor. Pass/no pass option only. Course may be repeated for credit for three quarters only. Open to students with an interest in specializing in bicultural, bilingual education.

Department of Economics

Economics is concerned with the way individuals or societies allocate scarce resources and distribute goods and services. Any situation requiring choice among competing alternatives can be viewed as an economic problem. Economics courses enable students to study the way individuals make these choices (microeconomics), the way governments make these choices (public choice), and the aggregate consequences of these choices (macroeconomics). In addition, the economics curriculum addresses international trade, money and banking, and economic development of the lesser developed nations.

The Department of Economics is composed of faculty with interests in a broad range of areas within micro- and macroeconomics, and the evaluation of public policy. It is especially strong in applied econometrics, public choice, and applied microeconomics including transportation, energy, industrial organization, labor, and urban development. Members of the Department maintain close ties with members of the Department of Politics and Society and the Graduate School of Management.

Students who entered UCI prior to fall 1989 should refer to the Catalogue edition in effect the year they entered to determine which major requirements they must satisfy.

It is anticipated that the number of students who are qualified to elect Economics as a major will exceed the number of positions available. Students applying for admission for Fall 1990 should be sure to file their application before November 30, 1989.

In the event the major in Economics receives more qualified applicants than can be accommodated, applicants may be subject to screening beyond minimum University of California admissions requirements. Freshman applicants not selected for Economics at the time of admission will be encouraged to opt for the Undeclared major within the School of Social Sciences or for any other open major for which they qualify. However, lower-division courses prerequisite to upper-division major study are available to all students, and selection to the Economics major at the end of the sophomore year will be based on performance in those courses.

Continuing-Student Applicants. Sophomore students who were not admitted to the Economics major upon their admission to the University may apply for entry into the major as a junior. Such students should apply for admission during the first five weeks of the spring quarter of their sophomore year in the Undergraduate Counseling Office, Social Science Tower 122. The following three criteria must be met to be considered for admission as a junior: the student must have (a) completed two quarters of calculus (Mathematics 2A and 2B) with a minimum grade of B, (b) completed the basic economic theory sequence (Social Sciences 12A-B-C) with a minimum grade of a B in at least two of the three quarters, and (c) must have completed the lower-division writing requirement. Selection criteria also will include affirmative action considerations.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major

To graduate with a B.A. degree in Economics, School

requirements must be met and must include 15 courses (60 units) as specified below:

- A. Social Sciences 12A-B-C; this course is a prerequisite for almost all upper-division economics courses.
- B. All majors must demonstrate competence in probability and statistics prior to enrolling in any upper-division economics course, or they must be concurrently enrolled in an approved probability and statistics course. Students may satisfy this requirement by completing Social Sciences 11A-B-C (Lecture A), or an equivalent course.
- C. All majors must demonstrate competence in calculus by completing Mathematics 2A-B or equivalent courses. Students must complete at least Mathematics 2A or an equivalent course prior to enrolling in Social Sciences 111A.
- D. Social Sciences 111A-B-C.
- E. Four additional four-unit upper-division economics courses. At least one of the four courses must be research-oriented and involve the production of a significant research paper. This required paper may be approved by any faculty member in economics. It is strongly recommended that students take either the data analysis sequence (Social Sciences 101A-B-C) or the econometrics sequence (Social Sciences 101D-E-F).

Honors Program in Economics

To graduate in the honors economics program, School requirements must be met and must include 19 courses (76 units) as specified below:

- A. Social Sciences 12A-B-C.
- B. Mathematics 2A-B-C must be completed prior to taking Social Sciences H111A.
- C. Mathematics 3A or an equivalent course.
- D. Social Sciences 11A-B-C (Lecture A) or equivalent courses.
- E. Social Sciences H111A-B-C.
- F. Social Sciences 101D-E or equivalent.
- G. An honors-level research paper.
- H. A minimum of four additional upper-division economics courses.
- I. Achievement of a grade point average of at least 3.0 in upper-division economics courses taken to fulfill requirements.

Lower-Division Courses

4 Introduction to Economics (4) F, W, S. An analysis of the problems society faces in organizing itself to provide goods and services. How decisions of government, business, and the individual relate to current economic problems such as unemployment, inflation, poverty, and environmental pollution. Open only to non-Economics majors. (III)

12A-B-C Basic Economic Theory I, II, III (4-4-4) F, W, S. The fundamentals of economic theory: microeconomics and macroeconomics. Theory of the behavior of firms and the behavior of consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency. Government behavior: monetary and fiscal policy, inflation and unemployment. This is the fundamental course required for all upper-division economics courses. (III)

Upper-Division Courses

Course modules emphasizing economics are assigned numbers from 111-116. Course modules emphasizing econometrics and data analysis in economics are assigned number 101.

101 Quantitative Methods

101A-B Data Analysis I, II (4-4). Practical applications-oriented course on multiple regression. How to discover and explore general socioeconomic models in data. Prerequisite: simple probability and statistics (Social Sciences 11A-B-C strongly recommended).

101C Data Analysis-Writing (4). Advanced regression analysis. Covers practical techniques for solving model-building problems. Strong emphasis on learning clear, effective writing. Prerequisite: Social Sciences 101E or Social Sciences 101B.

101D-E-F Econometrics I, II, III (4-4-4) F, W, S. Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics. Prerequisites: Mathematics 2A-B-C; Social Sciences 11A-B-C, or consent of instructor. **101F:** Seminar course in which students complete either an applied or theoretical econometric research project.

101G-H Techniques of Data Collection I, II (4-4). Basic methods and theories of proximity and preference data collection including pile-sort, ranking, triads, item-by-use matrices, rating, and free-listing. Multidimensional scaling, clustering, and quadrat assignment approaches are utilized. Extensive hands-on computer use. Prerequisite: Social Sciences 11A-B-C, 100A-B-C, or consent of instructor. Same as Social Sciences 135B-C.

101N Time Series Analysis (4). An introduction to the basic techniques of time series analysis. Univariate time series models and forecasting. Multivariate models. Transfer function models. Relations between time series models and econometric models. Prerequisite: Social Sciences 101D.

111 Economic Theory

111A-B-C Intermediate Economic Theory I, II, III (4-4-4) F, W, S. Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems. Prerequisites: Social Sciences 12A-B-C; Mathematics 2A or equivalent.

H111A-B-C Honors Intermediate Economic Theory I, II, III (4-4-4) F, W, S. An advanced and mathematical version of Social Sciences 111A-B-C for students in the Honors program. Prerequisites: Social Sciences 11A-B-C and Mathematics 2A-B-C.

111D Advanced Macroeconomics (4). Consumption and investment theories. Theories of money demand and supply. Capital accumulation, economic growth, productivity and supply-side theory. Rational expectations in macroeconomic models of inflation and unemployment. Macroeconomic dynamics. The balance of international payments. Fiscal and monetary policies to counteract demand and supply shocks. Prerequisite: Social Sciences 111C.

H111D Honors Advanced Macroeconomics (4). Subject matter is that of Social Sciences 111D but is more advanced and mathematical and includes additional topics. Prerequisites: Social Sciences H111A-B or equivalent.

111F The Economics of Accounting Principles (4). Introduction to accounting concepts and principles, including the accounting model and accounting cycle, transaction analysis, and the preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits). Same as Social Sciences 180J.

111X History of Economic Thought (4). Discussion of the principal schools of economic thought. Emphasis on ideas expressed by Smith, Malthus, Ricardo, Marx, Jevons, J.B. Clark, Bohm-Bawerk, Wicksell, Marshall, and Keynes. Assignments include readings (in English) of important selections from the original works. Prerequisite: introductory course in economics.

111Z Economic Development (4). Characteristics of underdeveloped economies. Theories of underdevelopment and development. Domestic and international policies for economic development. Prerequisites: Social Sciences 12A-B-C. Strongly recommended prior or concurrent courses: Social Sciences 11A-B-C or equivalent. Same as Social Sciences 131Z.

112 Individual and Collective Choice

112A Individual Decision Making (4). Consideration of the problems associated with decision making under uncertainty.

Discussion of the foundations of modern utility theory, random variables, probability distribution, opportunity loss, the value of perfect information, and Bayes' theorem. Prerequisites: Social Sciences 12A-B-C. Same as Social Sciences 126G.

112B The Economics of Risk and Uncertainty (4). The theory of insurance and joint-ownership of risky enterprises; optimal procedures for the allocation of uncertain payoffs. Prerequisites: Social Sciences 12A-B-C.

112C Portfolio Selection and Capital Market Theory (4). Optimal design of portfolios based upon mean-variance characteristics. An examination of the efficiency of present-day capital markets. Prerequisites: Social Sciences 11A-B-C and 111A-B-C.

112F Models of Collective Decision Making (4). Introduction to formal models of social choice, with emphases on the theory of committees and elections; economic models of social interaction, game theory, and coalition behavior; judgmental accuracy of group decision making. Prerequisites: Social Sciences 12A-B-C. Same as Social Sciences 126L and 154M.

113 Economics of Public and Private Organizations

113A-B-C Economic Analysis of Government Behavior I, II, III (4-4-4). The study of government using the tools of economics. **113A:** The influence of voters' preference on governmental policy; Arrow's impossibility theory; the Downsian theory of voting. **113B:** The effects of various taxation and expenditure policies, such as social security. **113C:** Research course in which students write a paper testing one of the theories covered in the first two quarters of the sequence. Satisfies Economics research requirement. Prerequisite: Social Sciences 111A-B. Same as Social Sciences 126D-E-F.

113D-E Political Economy of National Defense I, II (4-4). **113D:** Analysis of the adoption of military solutions to international problems; military budgets, weapons policy, and procurement; distribution of benefits and costs of military systems. Emphasis given to nuclear military policy. Focuses on empirical and descriptive works on policy and practice. **113E:** Research seminar. Research paper required.

113F Economics of Law (4). Examination of several economic concepts which are useful in the understanding of legal rules: externalities, the assignment of property rights, and Coase's theorem. Examples are drawn from the fields of pollution control, no-fault insurance, medical malpractice, and product liability. Prerequisite: Social Sciences 111A or concurrent enrollment in Social Sciences 111B.

113H-I-J Industrial Organization I, II, III (4-4-4) F, W, S. **113H:** The theory of monopoly and oligopoly, including price discrimination, the welfare loss due to monopoly, advertising, and product quality. **113I:** Regulation of industries such as airlines, trucks, and utilities. Actual regulation performance and rationale. **113J:** Antitrust. Current practice in light of economic theory concerning efficiency and the behavior of monopolists. Prerequisite: Social Sciences 111A-B-C.

113K-L-M Economics of Information and Incentives I, II, II (4-4-4). **113K:** Study of how incentive structures affect the decisions and actions of economic agents. The consequences of differing property rights for the existence and operation of markets and their implications for the use and allocation of resources. Contracts, structure of the firm, mining, primitive economies, fisheries, environmental management, invention, and innovation. **113L:** Information as an economic resource focusing on principles which govern the production, distribution, and value of information. Implications of different information structures for decision and the operation of markets. Auctions and procurement methods, contracts, searching, warranties and price guarantees, truthful and nontruthful mechanisms. **113M:** Directed research and writing. Prerequisites: Social Sciences 12A-B-C and 111A-B-C.

113N-O-P Urban Economics I, II, III (4-4-4). **113N:** Focus on spatial impact of economic process within urban areas. **113O:** Emphasizes economic theory and the assessment of the urban problem including housing, transportation, environmental quality, and public finance. **113P:** Allows students to apply knowledge

of urban and transportation economics in the conduct of individual research. Fulfills the research requirement in economics. Prerequisites: Social Sciences 12A-B-C. Strongly recommended prior or concurrent enrollment in Social Sciences 11A-B-C or equivalent.

113Q Economics of the Environment (4). Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution, e.g. air, water, noise, toxic waste, and nonoptimal utilization of certain resources, e.g. fisheries; analysis of public policies regarding these problems. Emphasis on microeconomic aspects of environmental problems from the standpoints of consumers, businesses, industries, and society. Prerequisite: Social Sciences 12A-B. Prerequisites: Social Sciences 12A-B-C. Same as Social Sciences 118A.

113R Transportation Networks (4). Models of transportation demand; optimal utilization of transportation networks; cost-benefit analysis of network design projects; the economic impact of transportation networks.

113S-T-U Political Economy of International Relations I, II, III (4-4-4). **113S-T:** Migration, trade, and finance in competitive markets; bargaining and compacts; hegemony and imperialism; alliances; multinational firms; international institutions; international law; war and national boundaries; common markets; nationalism; super power conflicts. **113U:** Research seminar.

113X-Y Multinational Corporations I, II (4-4). Examination of the goals, processes, and consequences of multinational corporations. Prerequisites: Social Sciences 4, Social Sciences 12A-B-C, or consent of instructor.

113Z Corporate Finance (4). Provides an analytic approach to modern economic finance theory. Covers capital markets, investment decisions, decision theory under uncertainty, capital asset pricing, and contingent claims theory. Prerequisite: Social Sciences 111A-B-C.

114 Human Resources

114A Labor Economics (4). Focuses on the role played by labor in the production and distribution of goods and services in an economy such as we have in the United States. A particular concern is the analytical framework used by economists to investigate labor's role in the economy. This analytical framework also provides the basis for examining such topics as unemployment, government policy toward labor, wages and inflation, and discrimination. Prerequisites: Social Sciences 12A-B-C, 11A-B-C, or equivalent.

114B The Economics of Discrimination (4). Examination of differential wage rates between the races and sexes. Examines theory, empirical work, and policy solutions. Prerequisites: Social Sciences 12A-B-C and 11A-B-C, or equivalent.

114H Research in Labor Economics and Human Resources (4). Students conduct an independent research project on a topic in any of the following fields: labor economics, industrial relations, women in the labor market, economics of education, and social behavior. Topic determined in agreement with instructor. Prerequisite: one course selected from among Social Sciences 114A-114G.

114L Economic Anthropology (4). Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world. Prerequisite: one course in general science, anthropology, economics, geography, or sociology. Same as Social Sciences 131E.

114P-Q The Economics of Traditional Societies (4-4). **114P:** Models and ethnographic descriptions of noncommodity exchange relations of the form that characterize intergroup and intragroup economic processes of many tribal societies. Includes analyses of gift exchange and exchanges within the household. **114Q:** Devoted entirely to supervised research by class members. Prerequisites: Social Sciences 12A-B-C; Social Sciences 114L or 131E recommended. Same as Social Sciences 131X-Y.

114R Political Economics of Work (4). An exploration of the functions of class in social, political, and economic theory. Includes a brief overview of U.S. and European labor history; discussion of the role of class interests in several current policy issues. Same as Social Sciences 126V.

115 Macroeconomics

115A Money and Banking (4). What is money, what does it do, and why is it important? How do depository institutions create money: What is the Federal Reserve Board, what does it do, and how does government affect its behavior? Why are interest rates so high/low, and who is responsible? And how about inflation? Prerequisites: Social Sciences 12A-B-C. Strongly recommended prior or concurrent course: Social Sciences 11A-B-C or equivalent.

115B International Money (4). Open economy macroeconomics and determination of exchange rates. Asset-market approach to the balance of payments. Internal and external balance in the economy. Macroeconomic policies under fixed and floating exchange rates. The international monetary system and institutions. Prerequisite: Social Sciences 111A-B-C or 111A-B and concurrent enrollment in 111C.

115C International Trade and Commercial Policy (4). Determination of trade flows and the relative prices. Gains from trade, the terms of trade, and income distribution. Imperfect competition and international trade. The effect of tariffs, export subsidies, and import quotas. The effects of free and restricted trade on economic welfare. Trade and industrial policies in developed countries. Prerequisite: Social Sciences 111A-B or concurrent enrollment in 111B.

115G Advanced Money and Banking (4). What happened in the Great Depression and why? Could it happen again? What is the transmission mechanism? What do economists know about the money supply process? What is the evidence on the demand for money? What are the more important current issues for monetary policy? Prerequisites: Social Sciences 12A-B-C and 11A-B-C, or equivalent.

115I The Japanese Economy (4). An analysis of the structure and performance of the Japanese economy in the post-World War II period. The mechanism and policies of rapid growth. Japan's industrial structure, labor market, and financial system. United States-Japanese trade friction and policy issues. Prerequisite: Social Sciences 111A-B-C or consent of instructor.

115P-Q Comparative Economic Systems I, II (4-4). Survey of models and real-world examples of different economic systems, ranging from market capitalism to planned socialism, with special emphasis on resource allocation mechanisms and contemporary economic problems such as inflation, unemployment, defense spending, labor, and energy shortage. Prerequisites: Social Sciences 12A-B-C.

117 Special Topics in Economics (4-4-4) F, W, S

117A-Z Special Topics in Economics (4). May be repeated for credit. Prerequisites vary.

The Curriculum in Geography

The curriculum in geography covers such topics as the evolution of the landscape, arrangement of urban centers, the internal structure of cities, the arrangement of industrial and agricultural activities, the pattern of movement of people, goods and ideas, and relationships between humans and the environment. Students may take geography courses toward completion of the Social Sciences major. The course of study leading to the B.A. in Geography is not available at this time.

Lower-Division Courses

5 Introduction to Geography. Basic introduction to geography.

5A Introduction to Human Geography (4). Human behavior in a geographical context. Spatial patterns and organization of the

cultural, social, and economic activities of man as imposed on and influenced by the earth's physical setting. (III)

5B Introduction to Physical Geography (4). An introduction to the physical world we live in. Distribution and dynamics of the earth's air, water, and solid crust. Concepts and principles from climatology and geology. Selected examples from North America and beyond. (III)

5C Environment and Resources (4). Analysis of physical landscapes with special attention to California and the West. Emphasis on interactive processes including man as an agent of environmental change. (III)

18A Evolution of Landforms (4). Introduction to geomorphology; major forces which shape the relief of the earth's surface and the forms which result from their activity. General principles demonstrated using examples from the western United States with special emphasis on California. (III)

18C Dynamics of the Physical Landscape (4). A seminar on landscape processes and the management of natural hazards (e.g., erosion, flooding, droughts, landslides, earthquakes). Emphasis on Southern California. Students research and make oral presentations on topics determined by agreement with instructor.

18D Models in Economic Geography (4). Economic decision making in a spatial context: the location, distribution, and dynamics of economic activities. Theories of population growth, urbanization, industrial location, interregional trade, and regional planning. (III)

Upper-Division Courses

Course modules emphasizing geography are assigned numbers 118.

118 Geographical Analysis

118A Transportation Networks (4). Models of transportation demand; optimal utilization of transportation networks; cost-benefit analysis of network design projects; the economic impact of transportation networks. Same as Social Sciences 113R.

118C Transportation Theory (4). Advanced topics in transportation systems analysis and planning; land-use and traffic generation; traffic flow and network theory; transportation impact; transportation policy. Emphasis on theoretical approaches and mathematical models. Prerequisites: Social Sciences 12A-B-C.

118D Urban Policy (4). The first quarter of a series of urban policy issues in view of the principles of urban politics and urban administration. Special emphasis on transportation problems.

118E Urban Theory (4). Urban theory as it pertains to American metropolitan areas. Location theory, central place theory, and theories of urban land use and social areas. Prerequisite: Social Sciences 118D or consent of instructor.

118F Urban Analysis (4). Students participate in design of an urban research project; involves analysis of transit systems and their relationship to urban structure of metropolitan areas. Focus is on the methodology of evaluation research as it relates to public programs and public policy analysis. Prerequisite: consent of instructor.

118L Spatial Structure of Metropolitan Areas (4). The spatial arrangement of activities in U.S. metropolitan areas. Identification of the economic, social, and technological processes which affect urban spatial structure. The processes of urbanization and suburbanization are discussed, and the policy implications of contemporary urban spatial structure are examined. Prerequisites: upper-division status and either Social Sciences 4 or 12A-B; Social Sciences 5A recommended. Same as Social Ecology E108.

119A-Z Special Topics in Geography (4) F, W, S. May be repeated for credit. Prerequisites vary.

Department of Politics and Society

The Politics and Society faculty emphasizes contemporary positive political theory, which entails the development of generalizations about political behavior and political processes. The faculty addresses many of the central questions in political science, including participation, conflict resolution, change, authority, policymaking, and political structures. The faculty has particular strength in interdisciplinary approaches

and in the application of quantitative data to political science issues. A diversity of courses in both micropolitics (individual and group politics) and macropolitics (politics at the state and international levels) are offered on a regular basis.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major in Political Science

School requirements must be met and must include 11 courses (44 units) as specified below:

A. Three introductory courses (12 units) in political science, Social Sciences 6A-B-C.

B. Two lower-division courses in political science (eight units).

C. Six upper-division courses in political science (24 units). Three of these courses must form a module.

Honors Program in Political Science: The Honors Program in Political Science is open to all departmental majors during the junior and senior years. During the junior year, Honors program students take three special honors seminars in the H127 sequence. These courses are primarily to prepare students for rigorous independent research and to provide intensive reading and discussion of the most influential works and most fundamental issues in modern political science. During the senior year, Honors program students write a thesis, designed and carried out under faculty supervision. They also meet regularly in a thesis seminar, to exchange ideas and analyze critically each other's work. Upon successful completion of the program, students graduate with "Honors in Political Science."

Political Science Minor Requirements

Requirements for the minor in Political Science are met by taking seven political science courses (28 units) as specified below:

A. One course from the Social Sciences 6A-B-C series.

B. Three upper-division political science courses, chosen from one of the Social Science modules numbered 120-128.

C. Three additional courses in political science, chosen from those numbered Social Sciences 6, 20-29, or 120-129.

Lower-Division Courses

6 Introduction to Political Science. Basic introduction to politics and society. These courses can be taken in any order.

6A Introduction to Political Science: Political Analysis (4). Presents various modes of understanding politics. Emphasis on basic approaches to political analysis, their uses in constructing theories, and their application to particular national political systems. (III)

6B Introduction to Political Science: Macropolitics (4). Introduction to political inquiry at the level of the nation-state. Addresses the questions: how do we account for the emergence of a world system of nation-states; how does the course of political development affect the distribution of political power within nation-states; what is the evolutionary linkage between liberal democracies and the transformation of capitalism; what are the major challenges to political governance facing western democracies. (III)

6C Introduction to Political Science: Micropolitics (4). Introduction to political behavior of individuals and groups within

national systems. Three major questions are addressed: How do individuals come to understand the political world? How do individuals behave within this world? How do groups and individuals engage in the political process? (III)

23A International Relations (4). Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined. (III)

23B Introduction to Theorizing About Politics (4). Types of questions: What is politics? What are the theoretical and philosophical bases for different types of political arrangements? How do these perspectives get translated into reality? Among others, the works of Rousseau, Locke, Mill, and Marx are read. (III)

23C Introduction to Comparing Political Systems (4). Presents various analytical methods used to compare political systems. Emphasis on examination of theories and research with national political systems as units of analysis. Understanding how it is possible to compare political units and make meaningful statements about them. (III)

23D Introduction to American Government (4). Basic introductory course in American political processes and institutions. Topics include elections, political participation, parties, interest groups, the Presidency, Congress, the bureaucracy, and the judiciary. Focuses on the influence that formal institutions have on determining primary political activity and on the extent to which the American system fulfills its institutional promise. (III)

24A Political Propaganda I (4). Covers a range of propaganda techniques from logical fallacies and the art of lying with statistics to studies of political campaign techniques and political cartooning. Aims to train students as reasonably sophisticated consumers of the political propaganda which is omnipresent in our environment. Analysis of the news and information features of the mass media. (III)

24B Introduction to Authority (4). An analysis of the nature, ubiquity, and types of authority relations. Attention is directed at the conditions for and bases of compliance and rebellion. Authority behavior in families, schools, work groups, and politics, as well as in "deviant" subcultures such as the Mafia, are examined. Same as Social Sciences 61D. (III)

25A Introduction to Party Politics (4). Examines existing typologies of party organizations and party systems. Specific party organizations from one-party, two-party, and multiparty systems are studied in depth. Examples are taken from Western Europe, Eastern Europe, and Third World countries.

25C Introduction to Public Policy (4). A general introduction to the developmental processes, determinants, and substance of U.S. national public policy. The stages of issue generation, agenda-building, policy resolution, and implementation are examined within the context of specific policy areas.

25F Television and Presidential Politics (4). Examines the relationship of television to the Presidency, using the 1984 primary elections and the presidential nominating conventions as case studies. Topics include Nixon's "Checkers" speech, the Kennedy-Nixon debates, Lyndon Johnson and the Living Room War, Watergate, and the media strategies of Ronald Reagan.

26A Small Group Behavior (4). Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes. Same as Social Sciences 61G.

26B Basic Societal Issues (4). For students who have serious concern about peace, economic justice, the environment, or the future of human society generally. Attempts to provide an understanding of the fundamental issues underlying such social problems; fundamental alternatives available for attempting to cope with them. Actual and proposed distributions of wealth, ways of forming public opinion, alternatives to the arms race and to mercenary control over government. Same as Social Sciences 61F. (III)

26D Nuclear Arms Race (4). Introduction to the history, technical basis, military capacity, and political conceptions and perceptions that bear on the global nuclear arms race. Topics include how weapons work and are delivered, theories of deterrence, arms race models, prospects for arms control and disarmament.

Upper-Division Courses

Course modules emphasizing society, politics, and social issues are assigned numbers from 120-128.

121 American Society and Politics

121A American Urban Politics (4). An analysis of the politics of urban and suburban cities. Main themes include alternative explanations of how political power is exercised and how policy decisions are made for urban governments; the structure of local political systems, including the problems of metropolitanism and federalism; the major policy problems facing the urban area (e.g., education, poverty, finances, crime), particularly from the perspective of the "underclass."

121B Politics, Public Policy, and the Mexican-American (4). What is unique about "minority" politics in American society? A public policy perspective provides a political overview of the Spanish-speaking (Mexican-American) community, the fastest growing population in the United States. "Chicano politics" and public policy issues are examined and linked to local, state, regional, national, and international politics.

121C Technology and Society (4). Explores the interactions between technology and the political system. Major themes include the impact of technology on contemporary society; the implications of a technological perspective on public policy; the use of scientific and technical information for policy making and policy monitoring; appropriate public policies toward specific technologies in government such as nuclear power; and visions of a technologically based socio-political system. Prerequisite: consent of instructor.

121D Urban Policy Analysis (4). Problem-oriented approach to urban political systems. Evaluation of the nature and quality of alternative analyses of a series of policy problems, such as low-cost housing, welfare policy, municipal transportation, law enforcement, community control, etc. Readings include "conservative" and "radical" perspectives. Prerequisite: consent of instructor.

121E Introduction to the Study of Law (4). Political implications of selected legal issues. Introduces students to the relationships between the political system and the legal system. Topics include voting rights, race relations (including affirmative action), women and the law, the right to privacy (including abortion), and the rights of the accused. Prerequisite: upper-division standing.

121F The United States Congress (4). Does the Congress do a good job of representing the American citizenry? Is it the most appropriate mechanism for the creation, resolution, and implementation of public policy?

121G The American Presidency (4). Presents a comprehensive survey of the American presidency and considers the question of political power.

121H Parties and Political Organizations (4). Discusses the development and function of the American party system and the rise of alternative political organizations.

121I Law and Society (4). Examination of the law and its various roles in society. Topics include: the nature and meaning of law; legality and power in the American system; law as a mechanism for social change; and the role of law in dispute processing, social control, and compliance with judicial decisions.

121K Jurisprudence (4). A survey of legal philosophies. Explores jurisprudence from the ancient Greeks to the present, including natural law philosophy, legal positivism and realism, sociological jurisprudence, and liberal, radical, and conservative thought.

121L Constitutional Politics (4). A study of the judicial process by which the Constitution is interpreted. Topics include judicial selection and recruitment; various theoretical approaches to constitutional interpretation, the study of court decision making, and the impact of the courts on the political system. Includes a variety of different sources such as cases, historical materials, and empirical studies.

121M Minority Power in American Cities (4). Explores how well Blacks, Hispanics, and Asian-Americans are doing in their search for political power and social change in America. Examines a

wide range of cities, focusing on differing demographics and cultures and on such political techniques as minority mobilization and multiracial coalition-building. Asks what benefits, if any, have been gained by minorities in their struggle for political power.

121S Electoral Behavior (4). Examines how voters evaluate political parties, candidates, and issues in electoral campaigns to reach their decisions. Numerous controversies concerning the degree of issue voting, sophistication of candidate evaluations, and the decline of political parties are discussed. Special attention to the theme of stability versus change in electoral behavior since 1952.

121U Research Seminar in Electoral Behavior (4). Students design and conduct an original research project in the field of electoral behavior, analyzing data from recent national election studies. Emphasis on learning techniques of data analysis and presentation. Prerequisite: Social Sciences 121S.

122 World Political Systems

122A Soviet Society and Politics I (4). An overview of the present sociopolitical structure and of the major national cultures within the Soviet Union.

122B Soviet Society and Politics II (4). Expanding on some of the themes of 122A plus individual research. Research can be on any Soviet topic. Prerequisite: Social Sciences 122A or consent of instructor.

122C Politics in Britain (4). An examination of the politics and processes of government in Britain; the operation of parliamentary government; the responses of the political system to the issues and problems in contemporary Britain. Issues to be explored include racism and immigration policy; economic stagnation and entry into the Common Market; Northern Ireland; the linkages between social class and politics.

122D French Politics and Society (4). A general overview of the nature of French politics and society. Some of the basic literature on France is read, and students select a topic of particular interest to them. Students with a reading knowledge of French particularly welcome.

122E East Asian Politics (4). Political systems of China, South and North Korea, and Japan. Role of history and culture, especially common Confucian heritage. Considers political participation, party systems, nature of legislatures and governing institutions, functions of bureaucracy, types of social groups that exist in each nation. Emphasis on similar roots and divergent paths taken in the mid-twentieth century.

122F The Politics of Sub-Saharan Africa (4). Traces the evolving patterns of political and economic developments affecting several sub-Saharan African political systems from pre-Colonial days to the present; the impact of these factors and the dilemmas they present to these nations in their struggle to fulfill the economic, political, and social demands and aspirations of their people.

122H-I Proseminar in Authority Relations (4-4). An examination of authority relations in workplaces and educational institutions in several societies. Two general issues are emphasized: adaptation to unfamiliar contexts and the possibility of "self-management" in organizations. Prerequisite: upper-division standing.

122L Advanced Macropolitics (4). Examination of the nature of "positive theories" and of three major approaches to constructing such theories in macropolitics: formal-legal study, political-culture inquiry, and rational-choice theory. General discussion of approaches with specific reference to explaining political stability and instability, legitimacy, and dissent. Prerequisite: Social Sciences 6B. Concurrent with Social Sciences 227E.

122M Canadian Politics I (4). An overview of contemporary Canadian government and politics. In addition to consideration of the basic structures and processes of Canadian government, topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec, and other issues associated with French-English relations.

122N Canadian Politics II (4). Intensive consideration of several topics in Canadian politics and society, leading to the writing of a research paper by each student. Topics are oriented toward con-

temporary issues of public policy. Prerequisite: Social Sciences 122M or consent of instructor.

122S Politics in China: Pre-1949 (4). Examines historically some significant features of Chinese politics and society; surveys the revolutionary setting and the revolution itself in the first half of the twentieth century; and presents central features of the post-1949 Chinese political system and its leadership dynamics, including policymaking, authority relations, governmental institutions, policy implementation, and forms of political participation.

122T Politics in the People's Republic of China: 1949-Present (4). Looks at the policymaking surrounding and the implementation of a series of major political movements in China during the Mao era and in its immediate aftermath (1949-78); examines the politics of the reform era (1978-88). Familiarizes students with the issues and political procedures that have engaged politicians and the populace in China over the past four decades, to help in understanding the forces at work in China today. Prerequisite: Social Sciences 122S recommended.

122U Latin American Politics (4). Competing theoretical frameworks for the explanation of Latin American (under) development. Evolution of the position of Latin American countries in the world economic and political system and the impact of this position on internal economic and political structures and processes. Basis for understanding the present-day configuration of social forces in various countries and types of governments promoting different models of development.

122V Politics of Development (4). Problems developing countries face and political implications of various attempts to deal with these problems. Skills for comparative political analysis gained by focusing on the interdependence of social, economic, and political structures and processes.

122X Comparative Politics: Five Nations, Four Continents (4). Studies five countries in a comparative fashion: their respective political histories and cultural traditions, the actual differences among their superficially similar party, parliamentary, and executive institutions. The countries chosen—France, Great Britain, Japan, Nigeria, and Mexico—represent four continents and stand at varying levels of economic development. Central-local relations, the role of government in the economy, and the place of social groups.

122Y Chinese Society (4). Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and the interplay with their Chinese community and culture. Same as Social Sciences 162Y.

122Z Politics, and Administration in Western Democracies (4). The influence public bureaucracies exert on policy making and how it affects policy goals of democratic society. Discussion of bureaucratic behavior and its implication for democratic policymaking in a comparative perspective encompassing the most important Western political systems.

123 Politics Among Nations

123D U.S. National Security and World Order (4). Examination of the bureaucratic, psychological, and domestic political environments which affect U.S. national security "managers." How the United States defines a "stable" and "orderly" world and formulates foreign policies designed to enhance national security.

123E Change and Conflict in International Politics (4). An intensive, participation-oriented seminar designed to analyze some of the major intellectual and historical questions motivating modern discussions of international politics. Topics include: theories of realism and neo-realism; consideration of hegemonic stability; the relevance of Marxism to theories of international relations; the analysis of world systems; the decline of U.S. world hegemony; and the potential for international conflict. Restrictions: upper-division standing only.

123G United States Foreign Policy (4). Stresses the changing international perspectives, policy instruments, and processes of decision making in the six U.S. presidential administrations since 1945. Concurrent with Social Sciences 223J.

123H Foundations in Modern Political Science (4). Provides an introduction to major works by highly influential scholars such as de Tocqueville, Marx and Engels, Mosca, Durkheim, Weber, Wallas, and Lasswell, that constitute the foundation of contemporary political science. Concurrent with Social Sciences 223G.

123M Theories of International Relations (4). Theories of international politics based on a cross-section of the fundamental literature in the field. An examination of contending theories on such topics as nationalism, power, decision-making, bargaining, imperialism, war, deterrence and arms control, and international integration.

123N Central America, Conflict Internationalization, and U.S. Policy (4). Examines the following concepts that help to explain U.S.-Central American policy dynamics: the roots of internal war, the efficacy of intervention, the role of public opinion and public diplomacy, the utility of coercive diplomacy and negotiations to achieve political objectives. Students work on group research projects. Prerequisite: consent of instructor.

123P Soviet Foreign Policy (4). A chronological analysis of Soviet international behavior from 1917 to the present. Geopolitical, ideological, and domestic sources of Soviet foreign policy and conduct in world affairs are considered from Lenin to Gorbachev.

123R International Law (4). Examination of the origin, changing structure, and application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order. Issues include the use of force, pacific settlement of disputes among nations, human rights, and international terrorism.

123S Peace and Conflict Forum (1-1-1) F, W, S. A faculty/student forum that meets weekly throughout the year and features lecturers from a variety of institutions discussing the issues of global peace and conflict. Pass/Not Pass only. Prerequisite: consent of instructor. Same as Humanities 180 and Social Ecology E148.

123T Peace and Conflict Seminar (2). Students will prepare a research paper under the direction of a faculty supervisor. Open only to those enrolled in the minor in Global Peace and Conflict Studies. Same as Humanities 181 and Social Ecology E185.

123U Revolution, The State, and the International System (4) S. A survey of theories of revolution change by case-study analysis of the Russian, Chinese, Cuban, Iranian, and Nicaraguan revolutions. Examination of potential revolutionary situations in the world today.

123V Underdevelopment and the International System (4). An analysis of competing explanations for the persistence of North-South inequality. Theoretical works and case studies are used to assess the role of domestic factors in relation and juxtaposition to the role of foreign political influences, multinational corporations, and international lending agencies.

124 Participation and Communication

124A-B Radical Social Proposals I, II (4-4). An examination of current proposals for alternative mass media systems, political systems, and economic systems. Focus is on proposals aimed at increased citizen participation and control, and at more equal distribution of wealth. Prerequisite for 124A: Social Sciences 26B or 61F. Prerequisite for 124B: Social Sciences 124A. Same as Social Sciences 162K-L.

124F The Language of Politics (4). Designed to acquaint the student, in some depth, with the relationship between language and politics. Theories of language and language use and theories of meaning are treated, as are specific applications of language in concrete political settings (elections, political argument, ideologies). Political language will be related to political action and to political understanding as a structuring of the world and as a form of participation.

124J Authority and Elites (4). Examines the formative experiences of political leaders and elites in authority relations, and the way these experiences influence their behavior and effectiveness as rulers. Emphasis on U.S., British, and French cases. Same as Social Sciences 161J.

124K Political Participation (4). The ways in which people in various political systems take part in politics, especially in activi-

ties directed towards affecting outcomes. Who is active, what they do, why they do it, and what difference it makes.

124L Political Ideology (4). Examination of how people think about and understand politics, covering a range of issues from the nature of liberalism-conservatism opposition to the development of ideological thought during the college years, and using the work of anthropologists, psychologists, sociologists, and political scientists.

124M Advanced Topics in the Study of Political Behavior (4). Topics covered include political socialization, effects of the mass media, and organization of political belief. Students are encouraged to review critically and to initiate an individual small-scale research project. Prerequisite: upper-division standing.

124S Participation and Equality (4). Examines authority relations in workplaces and schools, addressing two specific questions: To what extent can schemes of workers' participation in workplace governance succeed and form general participatory dispositions? Does the governance of classrooms and schools make possible increased equality through increased access to schooling? Same as Social Sciences 162V. Concurrent with Social Sciences 224S.

125 Political Theory

125B Political Thought Since Hobbes (4). Classic statements of political values from Hobbes to the present: classical liberalism, conservatism, radical democracy, liberal democracy, utilitarianism, "utopian" socialism, pluralism, socialism, Marxism, anarchism, fascism, democratic socialism, modern liberalism, neoconservatism. Emphasis on underlying views of human nature and history, and the social influences and psychological factors involved in the generation and acceptance of political principles and ideological orientations. Prerequisite: upper-division standing or consent of instructor.

125C-D Quantitative Theoretical Models in Political Science I, II (4-4). Methods of constructing quantitatively testable rational models. Interaction between empirical description and measurement, operationalization of concepts, and theoretical models. Models in physics and social sciences. Prerequisite: Mathematics 2A, Social Sciences 11A-B-C, or Social Sciences 100A-B-C.

125E Good or Evil: Studies in Human Nature (4). Addresses the central debate between positive social science and normative political theory: is there an intrinsic human nature? If so, what is it? What is its origin? And how much cultural variation does it display?

125F Modern Political Theory (4). Focuses on a different aspect of modern political theory each quarter.

125H Theories of Political Structure (4). An examination of alternative theories of political structure with particular attention to those found among sociologists such as Parsons, anthropologists such as Lévi-Strauss and Nadel, psychologists such as Piaget, and Marxists such as Althusser and Poulantzas. The objective will be to test the utility of these approaches for the construction of a theory of political structure. Prerequisite: upper-division standing.

125O Critical Political Theory (4). Acquaints students with current political theories, critical of conventional thinking, which attempt to join political, economic, social, historical, linguistic, and philosophical concerns to questions involving the relationships between and among individuals, groups, and institutions in the society, the economy, and the polity. Prerequisite: upper-division standing. Same as Social Sciences 161X.

125P Theories for the Study of Politics (4). A critical introduction to alternative theories used for the study of politics. Special attention will be given to interpreting political life as a system of institutions and behaviors.

125T Psycho-Social Theories of Politics (4). Focuses on recent attempts to make sense of the relation between the individual and society. Same as Social Sciences 154D.

125U Politics, Psychology, Philosophy: Marx and Nietzsche (4). Juxtaposes and compares two of the most powerful and penetrating intellects of the nineteenth century Marx and Nietzsche.

Lectures deal primarily with biographical material and historical setting. Reading and discussions emphasize systematic comparison of their respective views of human nature, history, social discontents, and the future of Western societies.

125X Varieties of Socialist Thought (4). Familiarizes students with a range of political thinkers who have written on the theme of socialism. In addition to Marx and members of the nineteenth-century English school of socialism, looks at socialist philosophies in the twentieth-century Third World, as well as writers on anarchism, syndicalism, revisionism, Lenin, and Mao.

125Y Chinese Political Theories (4). The development of Chinese political thought from the Zhou dynasty to Sun Yat-sen and Mao. Emphasis is on the core concepts of power, authority, political control, order, and the relationship between the individual and the state.

125Z Nietzsche (4). The social, economic, and political philosophy of Nietzsche. Nietzsche's seminal ideas about knowledge and language and how these ideas have influenced contemporary thinking concerning these subjects. Same as Social Sciences 162Z.

126 Politics and Social Sciences

126B Sexism and Power (4). Sexism may be seen as a particular form of socially constructed power which creates and maintains gender differences as relations and practices of structured inequalities. Males and females are objects constructed in a powered language dominated and controlled by males to their positional and distributional advantage. Prerequisite: upper-division standing. Same as Social Sciences 161R.

126C Social Movements and Collective Behavior (4). A survey of models of collective action drawn from sociology, economics, psychology, and political science, and focusing on areas such as social movements, strikes, crowd psychology, cults, fads and fashions, public opinion, and symbolic and mythical elements in collective culture. Prerequisite: Social Sciences 4, 6A, or 8A. Same as Social Sciences 161K.

126D-E-F Economic Analysis of Government Behavior I, II, III (4-4-4). The study of government using the tools of economics. **126D:** The influence of voters' preferences on governmental policy; Arrow's impossibility theory; the Downsian theory of voting. **126E:** The effects of various taxation and expenditure policies, such as social security. **126F:** Research course in which students write a paper testing one of the theories covered in the first two quarters of the sequence. Satisfies the Economics research requirement. Prerequisite: Social Sciences 111A-B. Same as Social Sciences 113A-B-C.

126G Individual Decision Making (4). Consideration of the problems associated with decision making under uncertainty. Discussion of the foundations of modern utility theory, random variables, probability distribution, opportunity loss, the value of perfect information, and Bayes' theorem. Prerequisites: Social Sciences 12A-B-C. Same as Social Sciences 112A.

126H Political Psychology (4). Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, the process of political decision-making, and the nature of political leadership. Same as Social Sciences 154H.

126J Social Cognition (4). Examination of how people understand themselves and others. Topics include causal attribution, person perception, and moral reasoning. Topic review draws on research done by social and developmental psychologists. Same as Social Sciences 154F.

126K Political Economy (4). Introduction to the interrelationships between the American economy and American politics. Follows two basic premises: (1) one can know nothing about politics if one does not understand its relationship to the economy; and (2) one can know nothing about economics if one does not understand how the economy is related to politics and how economic language is used for political purposes. Recommended: introductory courses in politics and economics.

126L Models of Collective Decision Making (4). Introduction to formal models of social choice, with emphases on the theory of committees and elections; economic models of social interaction,

game theory, and coalition behavior; and judgmental accuracy of group decision making. Prerequisite: Social Sciences 12A-B-C. Same as Social Sciences 112F and 154M.

126M Organizations (4). How bureaucracies, formal organizations, and voluntary associations work, how and why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations. The limits of bureaucratization and attempts to overcome these limits through decentralization. Same as Social Sciences 161E.

126Q Sociology of Conflict (4). Examination of theories of social conflict in the context of empirical research on social conflict among groups, among nations, and within communities, groups, and organizations. Prerequisite: upper-division standing. Same as Social Sciences 161Y.

126R History of Political Economy (4). Introduction to the major ideas in political economy. Stresses linkages between the humanities and political economic thought. A consideration of pre-market and socialist politico-economic systems focuses attention on the cultural, historical, and political influences on economic systems. Politico-economic thought is viewed as part of the larger body of scientific inquiry into the natures of nature and of man.

126V Political Economics of Work (4). An exploration of the functions of class in social, political, and economic theory. Includes a brief overview of U.S. and European labor history; discussion of the role of class interests in several current policy issues. Same as Social Sciences 114R.

126X Revolutions and Collective Political Violence (4). The major theoretical issues raised by revolutions and other forms of collective political violence: their role in history; their causes; the "process" of revolutions from remote symptoms of unrest to their aftermaths; practices of revolution and insurgency; and the personality of revolutionary leaders. Concurrent with Social Sciences 226E.

126Y Comparative Industrial Policy: China, France, and Japan (4). A broad, macro-level political comparison of three societies, not just a study of industrial policy. How industrial policy itself is formed and implemented in these three societies. Looks at all of the social structural features (cultural, sociological, ideological, historical, political, and organizational) that have enabled these countries to bring about large-scale structural transformation of their national economies in the face of economic crisis or upheaval.

126Z Economic Influence on Electoral Behavior (4). How the economy affects voting. Is its impact differentiated by socioeconomic class? When we vote, how crucial are ties to political parties, public expectations of future economic conditions, and political altruism?

H127A-B-C Honors Seminars in Political Science I-II-III (4-4-4). Required of students enrolled in the Honors Program in Political Science. Topics vary.

127D Junior-Senior Seminar in Political Science (4-4-4). Awareness of recent trends in political science is developed through attending faculty colloquia and talks on current faculty research, and through abstracting and discussing these talks. Prerequisite: upper-division standing.

H127G Theories of Social and Political Action (4). Analysis of major theories of social science. Includes DeTocqueville, Freud, Weber, and Bettleheim.

127I Government Internship I, II (4-4). A supervised research course designed to prepare students academically prior to undertaking a government internship at either the state or national level and/or for the analysis of information gathered during a preceding internship period. Major research paper required. Students may enroll in either quarter or both. Prerequisite: consent of instructor.

H127P The Distribution of Political Power in the U.S. (4). Assessment of the extent to which, and in what forms, a relationship exists between the citizen and governmental policies. Offers an

understanding of the answers which have been given (both empirically and theoretically) to the question of who has political power in the United States.

129A-Z Special Topics in Politics and Society (4). May be repeated for credit. Prerequisites vary.

The Undergraduate Major in Social Science Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements

A. Familiarity with some basic mathematical, computational, and statistical tools underlying modern social science. This requirement is met by passing three courses in mathematics (Mathematics 2A-B-C, Social Sciences 11A-B-C, or Social Sciences 100A-B-C) and one course in computer science (Information and Computer Science 1A). These courses normally should be taken during the student's first year.

B. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking two introductory courses in the School of Social Sciences bearing a one-digit course number. These courses normally should be taken during the student's first year.

C. An understanding of important advanced areas in social science. This requirement is met by passing satisfactorily nine upper-division courses in the School of Social Sciences, where at least three of these courses comprise a module. (See "Courses in Social Sciences" below for a discussion of course modules.) For modules which are listed with more than three courses, the student may normally elect to take any subset of three courses in the module. Appropriate substitutions may be made upon petition.

D. Four additional social science courses from any level.

Students are reminded that the Pass/Not Pass option is not applicable to course requirements A through D above or to any additional requirements listed for specific majors. However, Information and Computer Science 1A and Social Sciences 100A are exceptions to this rule and may be taken Pass/Not Pass.

Courses used to meet requirements B through D above are included in the computation of the grade point average in courses required in the major program.

Information on graduate programs and courses begins on page 234.

Lower-Division Courses

The social science curriculum includes major methodological and statistical courses suitable for social science students generally; courses which do not fall within disciplinary boundaries; and senior thesis, field study, and independent study courses.

1A Introduction to Social Science Analysis (4). Basic introduction to the art of using analytical models: how to create, test, use, and love them. Primary emphasis on developing skill and creativity in using concepts to predict, understand, and influence human behavior. (III)

1B-C Honors Introduction to Social Science Analysis (4-4). Introduction to mathematical models in Social Sciences. Sample topics: arms races; ecological models; linear programming; voting procedures; measurement theory; utility theory; Markov processes; models of cultural stability; paired-associate learning. Prerequisite: Mathematics 2A, or four years of high school mathematics, or equivalent.

1D Critical Thought and Writing in the Social Sciences (4). Preparation for reading and analyzing social science materials and for critical discussions, essay examinations, and research papers. Covers fact, evidence, logic, argument, grammar, and style; focuses on aspects of scientific presentation, reasoning, and debate.

H1E-F-G Critical Issues in the Social Sciences (6-6-6) F, W, S.

Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly small seminars emphasizing the development of the skills of critical thinking and quantitative analysis through regular written work are integral to the course. Prerequisite: restricted to members of the Campuswide Honors Program. Same as Social Ecology H20A-B-C. (III)

11A-B-C Probability and Statistics in the Social Sciences (4-4-4) F, W, S. An introduction to probability and statistics. Emphasis on thorough understanding of probabilistic and statistical logic and methods, as used in the social sciences. Examples from anthropology, economics, geography, linguistics, political science, psychology, and sociology. (V)

13A Introduction to Semiotics (4). How humans and other animals signify with and without language. The symbols of everyday life, of movies and literature, of religion and society. Symbolic systems and symbolic evolution. Same as Social Sciences 50R. (III)

19A Language and Society: Gender and Language (4). Recent sociolinguistic approaches to the expression of gender in language are scrutinized with a view to understanding how patriarchal social forms may be reflected in speech style, and how talk may be used to sexually objectify persons, reinforce sex roles, and encourage discrimination. Same as Social Sciences 50J and Linguistics 80.

80A Perspectives of Human Analysis (4). Lecture, three hours. Social analysts have different perspectives or ways of looking at human behavior. This course introduces students to the idea that they may not only "choose" the perspective or perspectives they think most interesting and stimulating, but may also devise ones of their own.

80C Women in Film (4). Raises women's issues; illustrates differing cultural and political roles of women in societies; produces a critical awareness of the role of visual media in modern society; raises the "consciousness" of participants.

Upper-Division Courses

Quantitative Social Science

Course modules emphasizing quantitative social science are assigned numbers from 100-101.

100 Quantitative Methods

100A-B-C Social Science Statistics I, II, III(4-4-4) F, W, S. 100A-B: Descriptive statistical concepts and techniques most widely used in social science research. Weekly laboratories employ computer graphics to investigate concepts. **100C:** Classical statistical inference, limited to simple random sampling or simple randomization designs. Characteristics of sampling distributions, bias, standard error, mathematical models, estimation, hypothesis testing. Fulfills the social science mathematics requirement. Same as Social Ecology 166A-B-C. (V)

100D Introduction to Survey Analysis (4) S. Student research teams analyze survey-generated data using the techniques from 100A-B-C. Students present their results at a symposium for that purpose. Concurrent enrollment in Social Sciences 100C is required. Same as Social Ecology 166D.

100E Introduction to Statistical Computing (4) W. Enables the student to utilize the analysis routines available within the Statistical Package for the Social Sciences (SPSS). Methods of data management and interpretation of computer output are presented. Prerequisites: Social Sciences 100A and concurrent enrollment in Social Sciences 100B. Pass/Not Pass only. Same as Social Ecology 166E.

100H Structures (4). Introduction to structural models of human thought, language, and social behavior. Mathematics used in these models is taught, including abstract algebra, graph theory, and formal languages. Prerequisites: Mathematics 2A-B-C.

101 Analysis of Data

101A-B-C Data Analysis I, II, III (4-4-4). Lecture, three hours. Practical applications-oriented course on multiple regression.

How to discover and explore general socioeconomic models in your data. Prerequisites: simple probability and statistics (Social Sciences 11A-B-C strongly recommended).

101D-E-F Econometrics I, II, III (4-4-4). Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics. Prerequisites: Mathematics 2A-B-C and 5A-B-C, or Social Sciences 11A-B-C, or consent of instructor. **101F** Seminar course in which students complete either an applied or theoretical econometric research project.

101G-H Techniques of Data Collection I, II (4-4). Basic methods and theories of proximity and preference data collection including pile-sort, ranking, triads, item-by-use matrices, rating, and free-listing. Multidimensional scaling, clustering, and quadratic assignment approaches are utilized. Extensive hands-on computer use. Prerequisites: Social Sciences 11A-B-C, 100A-B-C, or consent of instructor. Same as Social Sciences 135B-C.

101K Computer Programming FORTRAN Laboratory (2). A laboratory section for Social Sciences 101A, although it may be taken without enrolling in 101A. Emphasis on the kinds of practical data manipulation problems encountered with social science data. Students learn to write programs that sample, reorder, tabulate, transform, or plot data. Prerequisite: Information and Computer Science 1 or equivalent.

101L-M Seminar in Regression I, II (4-4). Advanced topics in regression analysis, illustrated by student-initiated research projects. Prerequisites: at least one quarter of multiple regression analysis and consent of instructor.

101N Time Series Analysis (4). An introduction to the basic techniques of time series analysis. Univariate time series models and forecasting. Multivariate models. Transfer function models. Relations between time series models and econometric models. Prerequisite: Social Sciences 101D.

Special Courses—Upper-Division

180 Upper-Division Special Topics

180A Exploring Society Through Photography (4). Students explore society through presentation, interpretation, and discussion of their own photographs. A few common exercises at the beginning of the quarter are followed by individual projects. Photography as social observation and the relation of photographs in an essay is stressed. Prerequisite: basic photo techniques.

180B Environmental Law (4). Environmental law is a combination of traditional legal principles and newly created statutes, rules, and decisions applied to the area of environmental protection. Investigates the roles of the courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality. Federal and state laws are utilized. Same as Social Ecology E162.

180C Social and Psychological Dimensions of the Movie (4). Movies are looked at from their anthropological perspective, i.e., as visual expressions of and influences on the culture from which they grow. The course scrutinizes films whose intent is to propagandize, arouse, terrify, amuse, revolt, and so on; the "language of the film" is studied from the semiotic viewpoint.

180D Chinese Culture (4). China from ancient times to the present.

180E Gandhi: Life and Legacy (4). Focus is on Mahatma Gandhi's life and career. The three themes are the formation of personal identity in a colonial society; the charismatic leader and mass politics; social theories of nonviolence and social change.

180H Japanese Culture (4). Japan from ancient times to the present.

180J The Economics of Accounting Principles (4). Introduction to accounting concepts and principles, including the accounting model and accounting cycle, transaction analysis, and the preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits) is examined. Same as Social Sciences 111F.

180K Advertising and American Culture (4). Examination of the function and content of advertising in the United States. Topics

include the structure and function of advertising agencies, marketing strategies, ad content and social values, and the role of advertising in capitalism, the "consumer culture," and social forecasting. Prerequisite: an introductory course in social science or consent of instructor.

180M Comparative Mythology (4). Reading and analysis of mythological literature from the Classical West, the Near East, Central Asia, and the Far East: the mythopoeic process, and modern uses of mythology in politics, religion, and social thought.

180U Philosophical Anthropology (4). Lecture, three hours. Reading and comparative analysis of theories of human nature, conduct, and history as found in selected philosophical and literary works by major writers in the Western and Eastern cultural traditions; emphasis on cultural anthropology, from Plato, Gotama Buddha, and St. Paul in ancient times to modern theories of man as formulated by dialectical materialism, psychoanalysis, and existentialism.

180V Comparative Religion (4). An introduction to the comparative study of religion as it occurs in the major tradition of the Western and non-Western worlds, including Judaism, Christianity, Islam, Hinduism, Buddhism, Confucianism, Taoism, and Shinto. Theories and origins of religious behavior are considered.

183 Women's Studies

183A-B Women's Studies Core Course I, II (4-4). Basic components of Women's Studies Concentration. In-depth study of women in society and culture, through anthropology, literature, psychology, sociology, and philosophy.

185 Advanced Seminars

185A-B-C People in Society (4-4-4). For seniors who would like to do a senior project on a topic having to do with people in society. A year-long seminar with emphasis on independent reading, research, and writing, and mutual help and criticism. Prerequisite: senior standing or consent of instructor.

189A-Z Special Topics in Social Sciences (4). May be repeated for credit.

190 Senior Thesis (4-4-4) F, W, S. Prerequisite: consent of instructor.

197D-Z Field Study (4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

198A-Z Group Independent Study (4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

199 Independent Study (2-4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit. Students may enroll for only one 199 each quarter.

Department of Sociology

In research and teaching, the Department's faculty emphasizes empirical sociological research, organizational theory, sociology of art and science, world systems analysis, gender, family, and social networks. The faculty is particularly strong in the areas of social structure and social inequality.

Sociology studies patterns of relationships among people, how behavior is shaped by the structure of society, and how conflict and cooperation among groups change society. Sociology majors are introduced to the most important ideas, methods, and findings of sociology in the required 8A-B-C sequence, explore basic subareas of sociology in the lower-division and upper-division core courses, and pursue specialized study in the 161 and 162 series courses.

Information on graduate programs and courses begins on page 234.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: See page 211.

Departmental Requirements for the Major

School requirements must be met and must include 11 courses (44 units) as specified below:

- A. Social Sciences 8A, 8B, and 8C.
- B. One introductory course (four units) in Social Sciences, taken from Social Sciences 1-7.
- C. Five of the following core courses in sociology (20 units). No more than two may be lower-division, and at least one must be taken from each set:
 - (1) Social Sciences 61D, 161D, 161E, 161F, 161G, 161H.
 - (2) Social Sciences 61A, 61B, 61E, 61F, 61G, 61P, 161I, 161K.
- D. Two additional upper-division sociology courses, or approved substitutes (eight units).

Sociology Minor Requirements

Requirements for the minor in Sociology are met by taking seven sociology courses (28 units) as specified below:

- A. Social Sciences 8A-B-C.
- B. Three of the following core courses in Sociology (12 units). No more than one may be lower-division and at least one must be taken from each set:
 - (1) Social Sciences 61D, 161D, 161E, 161F, 161G, 161H.
 - (2) Social Sciences 61A, 61B, 61E, 61F, 61G, 61P, 161I, 161K.
- C. One additional upper-division Sociology course (four units) chosen from those numbered Social Sciences 161 or 162.
- D. In addition, students must either satisfy the School mathematics and computer science requirement (School requirement A), or take three courses (12 units) or equivalent in a single acceptable foreign language.

Lower-Division Courses

8 Introduction to Sociology. Introduction to sociology and social psychology.

8A Introduction to Sociology (4). Major concepts and approaches to the study of society: social interaction, social differentiation, social control, social change, social institutions. (III)

8B Sociological Methods (4). Methods of data collection and analysis used by sociologists. Experimental methods, surveys, and interviews, field research and participant observation, demographic methods, historical and comparative approaches. (III)

8C Sociological Theory (4). What a theory of society is and is not. Historical and contemporary models, perspectives, and schools. (III)

61A Introduction to Social Psychology (4). Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction. Same as Social Sciences 50D. (III)

61B Introduction to Marriage and the Family (4). Basic issues concerning marriage, family, and kinship. Emphasis on cross-cultural and cross-societal comparisons. Kinship groups, the nature of human marriage, relationships of the family to other social institutions, child rearing, plural marriages, family politics, speculations concerning the future of the family. (III)

61C Understanding Social Facts (4). Focus on perspectives toward the question of what constitutes sociological knowledge and processes through which competent investigators have built sociological

arguments from data. Examination of several types of research techniques. (III)

61D Introduction to Authority (4). Lecture, three hours. An analysis of the nature, ubiquity, and types of authority relations. Attention is directed at the conditions for and bases of compliance and rebellion. Authority behavior in families, schools, work groups, and politics, as well as in "deviant" subcultures such as the "Mafia," are examined. Same as Social Sciences 24B. (III)

61E Urban Sociology (4). The nature, causes, and consequences of urbanization are examined along with its changing scale and complexity, demographic and ecological city growth patterns, the quality of life in urban areas, processes of decision-making in cities, and the bearing of sociological investigation on public policy concerns in contemporary urban society.

61F Basic Societal Issues (4). For students who have serious concern about peace, economic justice, the environment, or the future of human society generally. Attempts to provide an understanding of the fundamental issues underlying such social problems; fundamental alternatives available for attempting to cope with them. Actual and proposed distributions of wealth, ways of forming public opinion, alternatives to the arms race and to mercenary control over government. Same as Social Sciences 26B. (III)

61G Small Group Behavior (4). Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes. Same as Social Sciences 26A.

61P Social Problems (4). How institutional and organizational features of societies generate problems for people. Particular attention to political and economic inequality such as poverty, racism, sexism, urban and population problems, the environment, the criminal justice system. Emphasizes U.S. problems but severe social ills in the Third World also are addressed. (III)

61Q Anthropology of the Family (4). The family is examined by comparing the various forms of intimate social organizations in the world. Emphasizes families in non-Western societies although American and animal families are also studied. The "nature versus nurture" question is addressed in its modern form; sociobiology versus learning theory. Same as Social Sciences 31A and 55M.

61T Social Structures (4). Social structures are the patterned regularities in human interaction which are the major focus of sociological theory and research. Examination of several layers of social structure, moving from the small-scale "micro" configurations of small groups of people to the all-encompassing "macro" patterns of relationships between societies and nations.

61W Comparative Social Behavior (4). A comparative analysis of social behavior throughout the animal kingdom, emphasizing general theories of social behavior rather than the behavior of any particular species. Topics include the evolution of mating systems, parental behavior, altruism, and cooperation. Primate and human behavior will be presented as special cases of these general theories. Same as Social Sciences 31P.

Upper-Division Courses

Course modules emphasizing social interaction are assigned numbers between 160-168.

161 Sociological Theory

161A Social Change (4). Comparison of various theories of social change from the classical formulations of Marx and Weber through contemporary functionalist, neo-evolutionary, political economy, and world system perspectives. Emphasis is macrosociological, focusing on processes of transformation affecting societies, nation-states, or the international system as a whole.

161B-C Family and Community I, II (4-4). Students formulate and carry out a study on intimate relationships and interpersonal networks. Focus on family, friendship, and community, and on how people create a supportive network of relations in modern society. Prerequisite: consent of instructor. Same as Humanities 172D-DA.

161D Social Stratification (4). Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

161E Organizations (4). How bureaucracies, formal organizations, and voluntary associations work, how and why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations. The limits of bureaucratization and attempts to overcome these limits through decentralization. Same as Social Sciences 126M.

161F Theories of Deviance (4). Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Social Science 155B and Social Ecology J133.

161G Populations (4). Introduction to the analysis of human population including fertility, mortality, and migration and their effects upon age distributions, physical dispersion, sex distribution. Attention is focused on the effects of these variables on, e.g., overpopulation, social disorganization, and the stability of social institutions.

161H Sociology of Knowledge (4). How the social world helps to shape what we take for granted, what we notice, and what we believe. The creation, diffusion, and social influence of knowledge, thought forms, and symbols. The making and unmaking of ideologies. Truth and knowledge as *social* productions. How we give meaning to the world and to ourselves. Prerequisite: upper-division standing.

161I Mass Communications (4). An examination of the origin, history, and functions of mass communications and its effect on social life.

161J Authority and Elites (4). Examines the formative experiences of political leaders and elites in authority relations, and the way these experiences influence their behavior and effectiveness as rulers. Emphasis on U.S., British, and French cases. Same as Social Sciences 124J.

161K Social Movements and Collective Behavior (4). A survey of models of collective action drawn from sociology, economics, psychology, and political science, and focusing on areas such as social movements, strikes, crowd psychology, cults, fads and fashions, public opinion, and symbolic and mythical elements in collective culture. Prerequisite: Social Sciences 4, 6A, or 8A. Same as Social Sciences 126C.

161L Personality Impression Formation (4). Exploration into the body of knowledge concerning how we form, maintain, and change judgments of people. Prerequisite: upper-division standing.

161M Games as Models of Social Phenomena (4). Games as analogies of social, economic, and political situations. The interaction of contingency plans. Games (situations) with no winner and/or loser. Technical definition and discussion of conflict, threat, stability. Paradoxes involved in defining "rational decision." Prerequisite: one year of college-level mathematics. Same as Social Sciences 154G.

161O Fascism and Conservatism (4). Surveys the nature and practice of fascism and conservatism. Emphasis on fascism in the 1930s and neo-fascism in the U.S. and Europe in the 1970s and 1980s. Conservatism, including its various recent manifestations, examined.

161P Families in the Past (4). Goals are to familiarize students with recent interdisciplinary and cooperative work on family history and to involve students in research and analysis of family history materials, through the use of U.S. county records and perhaps interviews.

161Q Introduction to Ethnomethodology (4). Examines the contemporary school of sociology known as ethnomethodology through both readings and field experiments. Focuses on how we routinely, unremarkably, massively accomplish ordinary everyday reality moment to moment through interaction. The works of Schutz, Garfinkel, Sacks, Schegloff, Heritage.

161R Sexism and Power (4). Sexism may be seen as a particular form of socially constructed power which creates and maintains gender differences as relations and practices of structured

inequalities. Males and females are objects constructed in a powered language dominated and controlled by males to their positional and distributional advantage. Prerequisite: upper-division standing. Same as Social Sciences 126B.

161T Occupations and Professions (4). What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations.

161X Critical Political Theory (4). Acquaints students with current political theories, critical of conventional thinking, which attempt to join political, economic, social, historical, linguistic, and philosophical concerns to questions involving the relationships between and among individuals, groups, and institutions in the society, economy, and polity. Prerequisite: upper-division standing. Same as Social Sciences 125O.

161Y Sociology of Conflict (4). An examination of theories of social conflict in the context of empirical research on social conflict among groups, among nations, and within communities, groups, and organizations. Prerequisite: upper-division standing. Same as Social Sciences 126Q.

161Z Sociology of Peace and War (4). The social causes of peace and war, and how to build a stable peace. Topics include: how do different ways of raising children and organizing governments contribute to peace vs. war? Does inequality between women and men and between nations encourage war? Do nuclear weapons promote peace and security? What is the military-industrial-academic complex? Same as Humanities 172E.

162A Sociology Majors Seminar (4). Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student. Prerequisite: Sociology major or consent of instructor.

162C Men and Women: Sociology of Sex and Gender (4). Probes the sociological concept of gender roles and impact gender has on the lives of women and men. Analysis of theoretical explanations of gender roles, relating theoretical and academic research to social experience of students. Historical analysis of American gender roles, sexual politics, negative and positive aspects, and evaluation of current trends and implication for the future.

162D Korean Society and Culture (4). Provides introductory background to the social and cultural forces that affect the lives of the Koreans, with special reference to those in the United States. Considers traditional values and contemporary issues within a historical framework. Same as Social Sciences 134S.

162E Markets and Firms (4). Compares sociological and economic approaches to organizing complex tasks and transactions. The integration of these perspectives has produced great interest in recent research on work processes and social exchange. Examples of research on integration are drawn from both industrial organization and non-commercial areas.

162G Society and Religion (4). A critical and personal examination of the varieties of religious and spiritual experiences human beings are undergoing in contemporary society. The role of conscious understanding and unconscious conditioning regarding religion and spirituality.

162H The Study of Social Phenomena (4). The logic and mechanics of research on social organization. Several empirical reports are examined with respect to the processes by which their arguments are constructed. While formally independent, is useful for students interested in doing research projects in Social Science 162A.

162J Social Networks and Social Support (4). Examines the manner in which behaviors and attitudes of individuals are affected by their network ties to others. How are peoples' opportunities and well-being increased or decreased by their social networks? What are the processes involved? Topics vary and may include studies in mental and physical health, job seeking, separation and loss, and aging.

162K-L Radical Societal Proposals I, II (4-4). An examination of current proposals for alternative mass media systems, political systems, and economic systems. Focus is on proposals aimed at increased citizen participation and control, and at more equal distribution of wealth. Prerequisite for 162K: Social Sciences 26B or 61F. Prerequisite for 162L: Social Sciences 162K. Same as Social Sciences 124A-B.

162M Sociology of Gender Roles (4). A multidimensional examination of the more or less unconscious conditioning and taken for granted sex role programming in contemporary American society: the social mechanisms by which it operates, the social reasons why it is formed, and the social consequences of this arrangement. Same as Humanities 172H.

162R Social Psychology of Networks (4). Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange and communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues. Same as Social Sciences 154Q.

162S Sociology and Psychology of the Arts (4). Explores the relationship between artists and the "art world" through which artistic activity is defined, supported, and consumed. Empirical studies in the plastic arts, performing arts, and literature are used to examine varieties of aesthetic expressions.

162V Participation and Equality (4). Examines authority relations in workplaces and schools, addressing two specific questions: To what extent can schemes of workers' participation in workplace governance succeed, and form general participatory dispositions? Does the governance of classrooms and schools make possible increased equality through increased access to schooling? Same as Social Sciences 124S. Concurrent with Social Sciences 224S.

162Y Chinese Society (4). Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and interplay with the Chinese community and their culture. Same as Social Sciences 122Y.

162Z Nietzsche (4). The social, economic, and political philosophy of Nietzsche. Nietzsche's seminal ideas about knowledge and language and how these ideas have influenced contemporary thinking concerning these subjects. Same as Social Sciences 125Z.

169A-Z Special Topics in Sociology (4) F, W, S. May be repeated for credit. Prerequisites vary.

Graduate Programs

Graduate education within the School of Social Sciences is administered by faculty groups in Cognitive Sciences, Comparative Culture, Economics, Mathematical Social Science, Politics and Society, and the combined faculty in Anthropology and Sociology. Doctoral students may be admitted to one of six established concentrations: Cognitive Sciences, leading to the Ph.D. in Psychology; Comparative Culture, leading to the Ph.D. in Comparative Culture; Economics, leading to the Ph.D. in Economics; Social Networks, leading to the Ph.D. in Social Science; Politics and Society, leading to the Ph.D. in Political Science; and Social Relations, leading to the Ph.D. in Social Science. When the interests of the student lie outside of or across the areas encompassed by the recognized graduate programs, the Associate Dean of Graduate Studies, School of Social Sciences, may, on rare occasions, appoint a faculty committee of at least three members to guide an independent course of study leading to the Ph.D. degree in Social Science.

Although the School does not offer other programs leading to a Master of Arts degree, the M.A. degree in Comparative Culture, Economics, or Social Science may be conferred upon doctoral students who satisfy the requirements of the Division of Graduate Studies and Research.

Admissions

Potential graduate students should apply to the Office of Research and Graduate Studies for admission to the graduate program of the School of Social Sciences, indicating the title of the degree which they intend to pursue (Ph.D. in Comparative Culture, Economics, Political Science, Psychology, or Social Science), and the academic area in which they expect to concentrate. In addition to the University admission requirements, each group may prescribe special requirements or expectations of applicants. All applicants are required to submit scores for the Graduate Record Examination General Test. Letters of recommendation are an important factor in the admission decision.

Financial Support

Limited financial support in the form of teaching assistantships and fellowships is available to qualified students. There may be research assistantships available under grants to individual faculty. Students are expected to seek such aid for which they are eligible from sources external to the University.

General Requirements for the Ph.D. Degree in Economics, Political Science, Psychology, or Social Science

The general requirements for the Ph.D. in Economics, Political Science, Psychology, or Social Science (in addition to those which apply to all UCI graduate students) are summarized below. Each recognized group within the School of Social Sciences may prescribe additional requirements, subject to the approval of the Graduate Council.

Length of Study

The faculty envisages a student's Ph.D. program to be of approximately four to five years' duration.

Residence

Because the intellectual training offered by the School requires full-time study and constant contact with the faculty, the School does not accept part-time students.

Language

A knowledge of one foreign language, appropriate to the student's research concerns, is required. In Economics, a computer language may be substituted at the discretion of the faculty. Each student's group or candidacy committee will prescribe specific requirements. For those proposing to engage in field research, this may involve interviewing capabilities.

Quantitative Methods

Candidates for the Ph.D. degrees in Economics, Social Science, Political Science, or Psychology must satisfy a quantitative methods requirement. This may be met by (1) satisfaction of the quantitative methods requirement of the student's graduate program, or (2) completion of two years of college-level mathematics, statistics, logic, or applications of statistics to social science research problems, in courses approved by the faculty in charge of the student's graduate program. In the latter option, courses may include one computer science course; ordinarily at least one year of these quantitative methods courses will be taken during the student's graduate career.

Examinations

The scope and format of the qualifying examinations will be determined by the student's candidacy committee. These

examinations may be written or oral, or both, and usually will be conducted after approximately two years of residence. Also, a student may be required to take additional examinations, submit research papers, or conduct experiments which the committee deems appropriate to the student's interests and goals. Upon satisfactory completion of the qualifying examinations, and approval of the dissertation topic, the candidacy committee will recommend that the student be advanced to candidacy for the Ph.D. degree.

Dissertation

Following advancement to candidacy, the dissertation is supervised by a doctoral committee ordinarily consisting of three members of the candidacy committee. The purpose of the dissertation is to demonstrate the student's ability to originate significant research problems, to investigate such problems both broadly and deeply, and to write scholarly material of publishable quality.

Doctor of Philosophy in Comparative Culture

Participating Faculty

Dickson D. Bruce, Jr.: American Social and Cultural History, Southern History, Religion and Folklore, Expressive Forms of Black Culture

Peter Clecak: Social Theory, Postwar U.S. Society and Culture, American Higher Education

Raul Fernandez: Marxist Studies, Latin American and Chicano Culture, Afro-Cuban Music

James J. Flink: American Social and Cultural History, Historiography, Comparative American Cultures, Automobile History, History and Sociology of Jazz

Gilbert Gonzalez: U.S. History (Progressive Movement in Education, Education History of U.S.), Latin American History, Chicano and Latin American Cultures, Chicanos and the Educational System

Joseph G. Jorgensen: Mathematical Comparative Ethnology, Native American Language and Culture, Explanations, Theory, and Method in Social Inquiry

John M. Liu: Asian-American Culture, Immigration and Economic Structure, Labor and Social Movements, and World Systems Theory

Carlton Moss: The Media and Their Impact on Society

Dickran Tashjian: American Art and Literature, American and European Avant-Garde, Art and Technology

Douglas R. White: Social Networks and Relations, Cross-Cultural Comparison, Mathematical Models of Social Constraints

Joseph L. White: Black Psychology, Community Mental Health, Child Development, and Psychotherapy

The doctoral program in Comparative Culture emphasizes the interdisciplinary study of ethnocultural groups in the United States—dominant American, Afro-American, Asian-American, and Native American—including their interrelationships and antecedents. The program is designed to train research scholars in American and ethnic studies. It allows students to focus on one of two major approaches to cultural analysis. Students may choose to emphasize such expressive forms of culture as literature, religion, myth, and the arts in relation to history and society. Or they may choose to concentrate on social inquiry, including social theory and the perspectives provided by such social sciences as anthropology, economics, psychology, social history, and sociology. Thus, graduate students are prepared for academic positions in interdisciplinary programs as well as in departments of English, history, and various social sciences.

Admission

The program in Comparative Culture admits new graduate students in the fall. Requirements and standards for admission into the program are in keeping with those of the University of California as a whole. Students with a B.A. degree will be considered for admission on the basis of past academic

performance and current academic interests. In addition to the general application material, the program requires test results from the verbal and quantitative sections of the Graduate Record Examination. Minorities and women are particularly encouraged to apply.

Applicants for fellowship or assistantship awards must apply by January 1. Application for assistance based upon financial need (grants, loans, or work-study awards) is made through the UCI Financial Aid Office. Applications for admission received after March 1, but no later than July 1, will be considered for the fall quarter only if space is available—otherwise they will be deferred until a later quarter.

Residence

The University residence requirement for the Ph.D. is a minimum of six quarters.

Required and Elective Courses

The program requires 18 courses (72 units for the doctorate). Courses are selected in consultation with the program's graduate advisor so as to prepare the student for the first-year screening examination, the Ph.D. qualifying examination, and the development of a dissertation topic.

The following courses are required of students during their first and second years of graduate study:

Social Sciences 270A (Proseminar in Expressive Forms), 273A (Proseminar in Social Inquiry), 275A-B-C (Methods of Social Inquiry), 276A-B-C (Seminar in Expressive Forms of Culture), 271A-B-C (Colloquium on Dominant American Culture), 274A-B (Colloquium on Afro-American Culture), 274C-D (Colloquium on Asian-American Cultures), and 274G-H (Colloquium on Native-American Cultures). Additionally, students take two four-unit elective courses upon advisement during their first and second years of graduate study.

During the third year, students normally take elective courses and/or directed reading courses upon advisement in preparation for the Ph.D. qualifying examinations.

All graduate students, including Teaching Assistants and Associates, are expected to enroll for a minimum of 12 units of academic credit (ordinarily, three courses) each quarter. Any student who wishes to take more than four courses (16 units) must petition the Graduate Committee and gain the approval of the Dean of Graduate Studies.

Incomplete grades will not be assigned for year-long courses except under extenuating circumstances.

Credit for Previous Academic Work

Students entering with an M.A. degree may request credit for a maximum of nine courses. These courses normally are to be used in lieu of electives. A written petition requesting acceptance of previous work in lieu of electives must be made to the Graduate Advisor. Approval of the Dean of Graduate Studies also is required.

Language Requirements

Two foreign languages or one foreign language and statistics are required. The language will be determined by the student in consultation with the Graduate Advisor. The language requirement must be satisfied either through a standard Educational Testing Service examination or by another method approved by the Graduate Advisor. The statistics requirement can be satisfied by taking three quarters of course work

in social science statistics chosen in consultation with the Graduate Advisor. The language and/or the statistics requirements must be satisfied before the Ph.D. qualifying examination can be taken.

Comprehensive First-Year Examination

Two weeks after final examinations in the spring quarter, first-year students are administered a comprehensive examination based upon materials from their course work. The examination is administered by the program's graduate advisor. Normally the examination consists of four sections, corresponding to the required courses offered that year. Students are notified of the results within 10 working days of the examination.

A student must pass all sections of the comprehensive examination in order to continue graduate study. A student who fails the examination has the option of retaking those failed sections once prior to the beginning of the fall quarter. The results of the second examination will be final.

The Ph.D. Qualifying Examination

The Ph.D. qualifying examination must be taken by the end of the third year, after the completion of 84 units of course work, the language examination, and/or the language and statistics requirement.

Doctoral students are administered two examinations, one written and one oral, which are based upon the written examination.

The student's Ph.D. advisory committee is comprised of four members of the Irvine Division of the Academic Senate or of persons with equivalent qualifications, and is formed by the Graduate Advisor in consultation with the student and Comparative Culture faculty. The chair of the advisory committee and at least two other members of the examining committee must be Comparative Culture faculty. The committee administers the subsequent oral examination and guides the student's dissertation project. The committee is responsible for formulating the examination questions, though the entire Comparative Culture faculty may submit questions for the examination.

The written examination is based upon program courses and electives taken by the student in satisfaction of graduate course work. The written examination consists of four parts: nondominant cultures and classes, dominant American culture, cultural theory and method, and an area of specialization, perhaps including but not limited to the student's dissertation project. The fourth area is formulated by the student in close consultation with the examining committee. The written examination is administered over two days, each section requiring three hours of writing.

Students who fail the written examination may petition to take the failed portions a second time. Two failures culminate in expulsion from the program.

Upon successful completion of the written examination, the student may advance to the oral examination, which is given no more than two weeks later. The oral examination is conducted by a candidacy committee appointed in the name of the Graduate Council. This committee normally consists of the four members of the written examination committee, plus a fifth member who does not hold a faculty appointment in Comparative Culture. This committee recommends advancement to candidacy for the Ph.D. if the examination is successful.

The Dissertation

The student must present a written statement of a dissertation project to the dissertation committee, which must

approve the proposal. This statement must be presented within a year of successful completion of the qualifying examinations. The dissertation itself normally should be successfully completed within three years after the qualifying examinations.

The dissertation committee is appointed by the Dean of Graduate Studies on behalf of the Graduate Council upon the recommendation of the program graduate advisor after consultation with the student.

Master of Arts in Comparative Culture

Those doctoral students who pass the first-year comprehensive examination but do not continue beyond that point, or those who have passed the Ph.D. Qualifying Examination, may be awarded the Master of Arts degree by (a) completing 36 units (nine courses), 24 units (six courses) of which must be in Comparative Culture and 12 units (three courses) of which are approved electives in Comparative Culture or a related area; and (b) demonstrating proficiency in a language or an alternate skill.

Additional Information

Normal Progress. Normal progress is defined as earning B grades or better in all required courses, maintaining a B average in all course work, satisfactory performance on a first-year screening examination, satisfactory performance on the Ph.D. qualifying examination taken by the end of the third year, and satisfactory completion of the doctoral dissertation by the end of the sixth year. A grade of incomplete in any course must be replaced by a satisfactory grade within three quarters of its incurrence. Grades of incomplete will not be given for three-quarter or two-quarter course sequences except under extenuating circumstances. In Progress grades can be awarded for the first term of a two-quarter course and for the first and second terms of a three-quarter course.

To be eligible for a teaching assistantship a student can have no more than one incomplete within the last three quarters and must carry a minimum of twelve units per quarter with satisfactory grades for the last three quarters.

All incompletes must be resolved before the Ph.D. qualifying examination can be taken.

Leaves of Absence. A Student must formally petition the Graduate Advisor for a leave of absence from graduate study. Such leaves normally will be granted for medical or financial reasons. Students are entitled to no more than three quarters of leave during their tenure in the graduate program.

Doctor of Philosophy in Economics

Participating Faculty

Duran Bell: Formal Models, Economic Anthropology
David Brownstone: Econometrics and Industrial Organization
Michael L. Burton: Cognitive Anthropology, Economic Anthropology, Ecological Anthropology, Gender
Frank Cancian: Anthropology, Social Stratification, Economic Anthropology, Agriculture, Mexico
Linda R. Cohen: Political Economy, Social Choice, Government Regulation and Government Policy toward Research and Development
Tyler Cowen: Public Economics and Microeconomic Theory
Arthur S. DeVany: Theory of Markets, Transportation, Labor Economics, Industrial Organizations

Gordon J. Fielding: Urban Theory and Transportation Policy
 Maxwell Fry: Monetary Economics and Financial Institutions
 Amihai Glazer: Public Choice, Industrial Organization
 Bernard Grofman: Public Choice, Law and Economics, Models of Collective Decision Making
 John Johnston: Econometrics
 Sheen T. Kassouf: Econometrics, Economics of Uncertainty
 Charles A. Lave: Transportation Policy, Economics of Energy, Social Change
 H. Hiro Lee: Economic Development, International Economics
 David M. Lilien: Macroeconomics, Labor Economics and Applied Econometrics
 Julius Margolis: Economic Analysis of Government Behavior: Positive and Normative
 Giovanna Mossetti: Macroeconomics and Monetary Theory
 Stergios Skaperdas: Economic Theory, Monetary Theory
 Kenneth Small: Urban Economics, Econometrics, Transportation Economics
 Carole Uhlaner: Comparative Political Participation, Formal Models of Political Behavior

The Ph.D. program in Economics is administered by the Economics faculty who, drawing upon the School's strong quantitative tradition, specialize in econometric techniques applied to government behavior, labor economics, transportation economics, and urban economics. Admission to the Ph.D. program in Economics is highly selective and is limited to students whose interests mesh closely with those of the faculty. By requiring a high degree of overlap between faculty and student research interests, the program offers extensive faculty contact within a tutorial framework. Motivated and well-qualified students find the UCI graduate program in economics highly attractive because of its small size and its great flexibility. Self-discipline and an inquiring mind are prerequisites.

Requirements

All students must show competence in microeconomic theory, macroeconomics, and econometrics. Normally this is done by taking a three-course sequence in each of these areas. Students also must master two fields of applied economics by taking a two-course sequence (possibly including independent reading courses) and writing a research paper in each. Students also must enroll for at least four quarters in the graduate colloquium, in which attendance at regular Economics faculty research colloquia is supplemented by discussion of the papers presented and additional reading. Students are encouraged to become conversant with areas of current economic research early on in their graduate careers, in order to facilitate a timely transition from meeting course and field requirements to thinking through a dissertation research plan. After meeting the above requirements, the student will be advanced to candidacy upon completion of an oral examination on a written dissertation proposal.

Concentration in Transportation Economics

Students can also be awarded a Ph.D. in Economics with a concentration in Transportation Economics. This option draws upon the unusual collection of transportation researchers on the campus, both within the School of Social Sciences, the School of Engineering, the Graduate School of Management, and the Program in Social Ecology. Students benefit from association with the Institute of Transportation Studies, a systemwide research unit headquartered at UCI. It facilitates student research by providing research assistantships and interdisciplinary seminars on all modes of transportation.

Requirements for the concentration are the same as those described above with the following three exceptions: (1) students must substitute any two of the following four courses

for the third quarter of microeconomic and macroeconomic theory: Discrete Choice Econometrics (Social Sciences 213G), Advanced Travel Demand Analysis (Engineering CE220A), Operations Research for Management (Management 201B), Microeconomic Theory III (Social Sciences 212C); (2) one of the student's two required fields of competence must be transportation economics (typically including Social Sciences 214G and 214H), and the other must be a cognate field such as urban economics, labor economics, industrial organization, or a transportation-related field from outside economics such as travel demand and flow theory, urban and transportation policy analysis, environmental impacts of transportation, or urban and transportation planning (subject to the approval of the Director of Graduate Studies for Economics); and (3) students must take at least one additional course from a list of designated courses in transportation and related subject areas. The courses may be selected from the wide range of courses offered through the schools and programs participating in the concentration.

Research Facilities

UCI is a major research university and has an excellent library with a collection of more than one million volumes, as well as special interlibrary loan arrangements with other UC libraries. The School of Social Sciences provides a computer room, conference rooms, and offices for graduate students. Students have access to several campus computers, in addition to smaller facilities within the School. Two organized research units, the Institute of Transportation Studies and the Public Policy Research Organization, provide research opportunities and financial support for several graduate students with interests in those fields. Students may also participate in many individual faculty research projects.

Admission

The deadline for application for admission is February 1 for fall quarter. Students are admitted for winter or spring quarters only under exceptional circumstances. Late applications are considered on a space-available basis. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Verbal, quantitative, and the Economics Subject Test scores are required.

Doctor of Philosophy in Political Science

Participating Faculty

Michel Crozier: Organizational Sociology, Public Administration
 James Danziger: Urban Political Systems, Public Policy Analysis, and Technology and Politics
 David Easton: Political Systems, Political Structures
 Harry Eckstein: Macropolitics and Authority Relations
 Creel Froman: Human Analysis
 Bernard Grofman: Mathematical Models of Collective Decision Making, Formal Democratic Theory, Sequential Decision Making, and Politics of Small Groups
 Julius Margolis: Economic Analysis of Government Behavior
 Kristen R. Monroe: Political Economy, Rationality, American Politics, Methodology
 Jack W. Peltason: American Government, American Institutions, the Judicial Process
 Mark P. Petracca: American Political Institutions (Presidency and Congress), Interest Organizations, Public Policy, Power and Political Discourse

- M. Ross Quillian: Mass Communication, Participatory Forms of Social Organization, Sociological Theory, Sociology of Science, and Artificial Intelligence
 Dorothy J. Solinger: Chinese Domestic Politics and Political Economy, Comparative Politics, History of Political Philosophy
 Shawn Rosenberg: Political Psychology, Cognitive Psychology, Public Opinion
 William Schonfeld: Authority, Democratic Theory, and Comparative Politics
 Caesar Sereseres: U.S. Foreign Policy, U.S.-Latin American Relations, Mexican-American Politics
 Rein Taagepera: Mathematical Models and Quantitative Analysis of Elections, Inequality, Arms Races, Growth-Decline Phenomena and Soviet Baltic Area Studies
 Carole Uhlaner: Comparative Political Participation, Formal Models of Political Behavior
 Martin Wattenberg: American Political Behavior and Institutions

The Ph.D. program in Political Science emphasizes empirical democratic theory, with a focus on American politics and the politics of industrialized nations. Faculty interests include political behavior, political psychology, public choice theory, systems theory, mass media, and authority relations. Institutions of interest include the chief executive branch, bureaucratic politics, political parties, and representation and electoral systems. The strengths of the Political Science graduate program include its small size, its personalized attention to students, and its location within an interdisciplinary school. Special emphasis is placed on recruiting students whose interests overlap with those of faculty. Students with an interest in comparative political behavior are encouraged to spend a portion of their third year of graduate study at a research site in another country as part of various ongoing multinational research projects.

Two Organized Research Units, the Institute of Transportation Studies and the Public Policy Research Organization, and one Irvine Research Unit, the Institute for Mathematical Behavioral Sciences, offer opportunities for participation in ongoing faculty research. One group of Political Science faculty share interests in applied Public Choice with faculty members in both economics and philosophy; another group is involved with the program in Global Peace and Conflict Studies; and others are involved with the study of China. Another subset of faculty, together with distinguished visitors from leading European universities, is involved with the study of parties and elections in industrialized nations; while another group of faculty studies the impacts of the media and of information technology on politics.

Admissions

Students are normally expected to have a grade point average above 3.0 and scores on the two parts of the Graduate Record Examination (GRE) General Test which total over 1,100. Decisions on admission are strongly influenced by letters of recommendation and by the statement of student interest. Foreign students must satisfy English-as-a-Second Language requirements. Students are normally admitted for fall quarter; admission for winter or spring quarters is available only under exceptional circumstances.

Requirements

The following requirements are in addition to those of the School and the University. First-year students must take a core program of graduate seminars, focusing on major substantive areas as well as research methods. Students who have not already taken college mathematics are required to take at least three quarters of approved mathematics or statistics courses. Attendance in a colloquium series also is required for all graduate students during their first two years in residence.

Reviews and Examinations

Students ordinarily are expected to maintain a grade point average of 3.5 or better. At the completion of the first year, a review of performance in the graduate program will be conducted for each student by the Politics and Society faculty.

A set of three papers, normally completed by the end of the second year of study, tests the student's competency in a set of major domains for intellectual inquiry. These domains are determined by the student and the Political Science Graduate Director. Upon successful completion of these papers and demonstration of competence in mathematics and foreign language, a candidacy committee is appointed to oversee the final qualifying examination and the formal advancement to candidacy. Students are expected to advance to candidacy by the ninth quarter of graduate study.

After the student advances to candidacy, the doctoral committee, usually composed of three members of the candidacy committee, supervises work toward completion of the dissertation.

Doctor of Philosophy in Psychology

Participating Faculty

- William Batchelder: Mathematical Models of Learning and Memory, Mathematical Psychology, and Measurement
 Isabel Birnbaum: Human Memory and Alcohol
 Hagit Borer: Theoretical Syntax, Cognitive Theories, Language Acquisitions
 Myron Braundstein: Visual Perception and Computer Applications
 Tom N. Cornsweet: Visual Psychophysics, Visual Psychophysiology, and Electro-optical Instrumentation
 Michael D'Zmura: Visual Perception, Color Vision, Attention and Image Understanding
 Jean-Claude Falmagne: Mathematical Psychology
 Donald Hoffman: Artificial Intelligence Approaches to Human and Machine Vision, Recovery of Three-Dimensional Structure from Image Motion, Visual Recognition of Objects by Their Shape
 Tarow Indow: Mathematical Models in Visual Space, Color Space, and Human Memory
 Geoffrey J. Iverson: Cognitive Science and Mathematical Models
 Mary-Louise Kean: Linguistic Theory and Biological Foundations of Higher Mental Processes
 David LaBerge: Attention, Pattern Identification and Language Processing
 R. Duncan Luce: Mathematical Behavioral Science
 Virginia Mann: Speech Perception and Its Development, the Development of Reading Ability, Development of Dyslexia
 Robert May: Theoretical Linguistics, Syntax, Semantics of Natural Language
 Louis Narens: Measurement, Logic, and Metacognition
 W.C. Watt: Cognitive Semiotics
 John I. Yellott, Jr.: Mathematical Psychology and Visual Perception

The Ph.D. program in Psychology is administered by the Cognitive Sciences faculty who share common interests in human cognition and who are concerned with how the mind works. It conducts research and provides advanced graduate training in cognitive psychology and theoretical linguistics. The group lays special stress on precise scientific approaches to issues in human cognition. It views the formation of formal models as instrumental in understanding the nature of the human mind.

The group takes as its intellectual domain the following: mathematical psychology, perception (visual and auditory), cognitive development, problem solving, artificial intelligence, learning, memory, psycholinguistics, semiotics, and theoretical linguistics. It does not emphasize traditional training in psychology or linguistics per se; rather, it stresses the integration of research in the areas mentioned above, and in related areas, into a discipline whose central focus is the study of human knowledge and human information processing, regardless of the medium in which it is expressed.

Admissions

In addition to meeting the general requirements for admission, applicants should have acquired a background in mathematics equivalent to at least one year of calculus. Advanced courses in some of the following fields are considered highly desirable: computer science, mathematics and the physical sciences, biology, logic, and linguistics. Each admission application will be considered on its own merits.

Requirements

Each student is expected to take two three-course graduate sequences. The first is a three-quarter methods sequence covering the areas of probability and statistics, experimental design, and mathematical models of language (Social Sciences 241A, 241B, 241C). The other is a proseminar sequence covering areas such as learning, memory, perception, and linguistics (Social Sciences 242A-B-C). Suitable substitutes may be made with written approval of the group. Additional advanced course work in other fields relevant to the student's interests will supplement the required courses. Students are expected to enroll in the Cognitive Sciences Research Seminar (Social Sciences 240A-B-C) during all quarters in residence prior to advancement to candidacy.

Each student is expected to carry out theoretical/empirical research during the first two years. By the end of the second year, each student should have completed a research project of a scope and nature that is potentially publishable in a relevant journal. The student's advisor is responsible for assisting in the planning and other facets of the project. Students are expected to write a paper based on their research and to present a talk to the "Cognitive Sciences Seminar" or another appropriate forum by the end of the spring quarter of their second full year in the graduate program.

Reviews

At the end of each academic year the faculty in the group will meet to discuss the progress of each of its students and to provide feedback on the progress and perceived deficiencies of each student.

The advancement-to-candidacy examination will consist of an oral examination and, at the faculty's option, a written examination as well. Normally this step will be completed by the end of the third or beginning of the fourth year of the program. The examination will be based on the student's dissertation proposal. A student who fails the examination twice will be asked to withdraw.

Prior to submission of the final version of the dissertation the student will be expected to defend the dissertation in a public colloquium.

Doctor of Philosophy in Social Science

The Ph.D. program in Social Science comprises two concentrations, one in Social Networks and the other in Social Relations, that are administered by the mathematical social science faculty and the anthropology and sociology faculty, respectively.

Concentration in Social Networks

Participating Faculty

William Batchelder: Mathematical Models, Measurement, and Cognitive Processes
 John P. Boyd: Mathematical Anthropology and Systems Theory
 Michael L. Burton: Cognitive Anthropology, Economic Anthropology, Ecological Anthropology, Gender, Research Methods
 Michael Butler: How People Learn and How They Can Learn Better
 Douglas Chalmers: Problem Drinking, Social Psychology, and Human Rule Systems
 Linton Freeman: Network Models of Social Structure
 Tarow Indow: Mathematical Psychology and Perception
 Jerome Kirk: Sociology, Social Anthropology, Social Psychology, Social Control, and Politics
 Louis Narens: Measurement and Logic
 Robert Newcomb: Statistics, Research Methods in the Social Sciences and Education, Use of Computers in Education
 A. Kimball Romney: Experimental and Psychological Anthropology
 David A. Smith: Urbanization, Comparative/Historical Sociology, Political Sociology, World-System Analysis
 Christian Werner: Mathematical Social Science
 Douglas R. White: Anthropology, Social Networks and Relations, Cross-Cultural Comparison, Mathematical Models of Social Constraints, Decision-Making Networks, and Social Processes

Faculty in Mathematical Social Science offer a concentration in Social Networks that stresses the development of a perspective which focuses on the patterns or forms of the structures of relations that link persons or other social actors together in coherent wholes.

Thus, Social Networks has abstracted out the *structural* parts of each of these fields. It is concerned with problems of representing such structures, both statically and dynamically, and with exploring the implications of structural form for individual and collective behavior. In addition, the networks perspective has important applications in the study of international relations, organizational behavior, health and mental health, and human communications research.

Admission

The graduate concentration in Social Networks seeks qualified graduate students who are well-trained in either (a) a structural approach in some traditional social science discipline or (b) mathematics. Students also should be willing to learn either a set of social science orientations and models or the appropriate mathematical skills to do research in social networks, depending upon their prior training. Students normally are expected to have a grade point average above 3.0 and scores on the two parts of the Graduate Record Examination (GRE) General Test which total more than 1,100. Decisions on admission are strongly influenced by letters of recommendation and the statement of student interest.

Requirements

Students are encouraged to develop their own research foci and specializations within the general social networks perspective. All students are expected to become acquainted with the general perspective and to develop a minimum set of formal and methodological skills.

A set of core courses has been developed that is aimed at acquainting incoming students with theoretical, mathematical, and methodological tools for the study of social networks. Selection of other courses will be by agreement between the student and their advisor. In addition to relevant courses

offered throughout the School, courses specifically tailored for students in Social Networks are offered by the Mathematical Social Science Group faculty on a regular basis.

Reviews and Examinations

Students enrolled in the concentration are expected to meet the requirements of UCI and the School as well as those of the concentration. In addition, each student is reviewed three times to ascertain progress.

The first review is conducted by Mathematical Social Science faculty on the basis of each student's first-year performance. The review results in a faculty-student conference in which a recommendation is made for continuation or withdrawal.

The second review concerns the student's qualification for advancement to candidacy and is conducted by a committee consisting of at least three Mathematical Social Science faculty and two other faculty from the campus or one from the campus and one from another University of California campus. The examination is designed to assess the likelihood of the student successfully completing the Ph.D. dissertation and is based on the student's dissertation research proposal as well as on the progress in course work. Students are expected to complete this examination on or before the end of their third year of residence.

The third review is a dissertation defense. The defense will be in the form of a public colloquium presentation. The faculty may recommend revisions, after which the dissertation may be submitted for the doctoral degree in Social Science.

Concentration in Social Relations

Participating Faculty

Duran Bell: Models of Social Relations, Economic Anthropology
 Michael L. Burton: Cognitive Anthropology, Economic Anthropology, Ecological Anthropology, Gender, Research Methods
 Francesca M. Cancian: Gender Sociology of the Family, Peace and War
 Frank Cancian: Social Stratification, Economic Anthropology, Mexico
 Leo R. Chavez: International Migration, Urban Anthropology, Medical Anthropology, Public Policy, Latin American Anthropology
 Benjamin N. Colby: Empirical Anthropology, Cognitive Science, Psychology and Personality, Behavioral Medicine, Culture Theory, Evolution, Social Pathology
 James Ferguson: Political Anthropology, Economic Anthropology, Systems of Thought and Discourse
 Linton Freeman: Network Models of Social Structure
 Robert Garfias: Expressive Culture, Ethnomusicology, Politics and the Arts, Japan, Burma
 Samuel L. Gilmore: Sociology of Culture, Sociology of Art and Science, Complex Organizations and Work
 Jerome Kirk: Comparative Sociology, Urban Anthropology, Research Methods
 Karen Leonard: Anthropology and Social History, Society, Caste, and Family in India, Comparative Family History, Asian-American History
 Craig MacAndrew: Social Psychology, Personality Theory, Alcohol/ Substance Abuse
 Duane Metzger: Cognitive Anthropology, Belief Systems and Semantic Analysis
 A. Kimball Romney: Cognitive Anthropology, Social Networks, Mathematical Social Science
 Arthur Rubel: Medical Anthropology, Peasant Social Organizations, Social Stress Analysis
 David A. Smith: Urbanization, Comparative Historical Sociology, Political Sociology, World-System Analysis
 Judith Treas: Population Studies, Sociology of Aging, Social Stratification, Sociology of Family
 Douglas R. White: Cross-Cultural Research, Mathematical Anthropology, Social Networks

Faculty with Related Interests

Mark Baldassare: Urban Sociology, Public Opinion Research
 Jonathon E. Ericson: Archaeological Sciences, Prehistoric Ecology, Exchange, Social Organization and Dietary Reconstruction
 Howard B. Waitzkin: Comparative Health Care Systems, Primary Care and Community Medicine, Doctor-Patient Communication

The doctoral program in Social Relations centers on interdisciplinary research in social science, particularly where the traditional concerns of sociology and anthropology converge. Because of a low student-to-faculty ratio, each student works closely with a faculty committee to develop an individualized course of study. Students may work on a broad range of topics, with special emphasis on cognitive anthropology and the sociology of culture, culture and health practices, family and gender, Third World development and social change, and social structure and networks.

Admissions

The faculty welcomes students from diverse educational and social backgrounds. Students who have research interests corresponding to those of specific faculty members are especially encouraged to apply to this apprenticeship-type program.

Requirements

Each new student is assigned an advisor who serves until a three-person committee is formed. The committee oversees the student's academic work and ordinarily is chaired by the faculty member with whom the student plans to work most closely.

A core seminar which meets weekly throughout the year is required of first-year graduate students. Additionally, three basic courses in particular substantive areas of anthropology and sociology are offered each year as core courses. In each of their first two years, students must take two of these three focused seminars. Two quarters of statistics, computer science, or other appropriate analytical methods are required. Students also take additional seminars pertinent to their own research interests.

Course work usually takes two years, during which time students choose an area of concentration. By the end of the third year, students are expected to have selected a faculty committee and to have made plans for their doctoral dissertation research. All students are expected to continue to participate in both the Social Relations Colloquium Series and in less formal aspects of intellectual life in the program.

Reviews

During the first year each student will prepare an original paper, which will be presented by the student at a meeting during the spring quarter. The group will provide the student with a detailed written critique of the paper as part of the first-year evaluation of the student's overall progress.

The second review takes the form of an advancement-to-candidacy examination. This ordinarily is conducted by the student's committee and two additional faculty members from the campus. Students are expected to take this examination no later than the spring quarter of their third year.

Satisfactory completion of the dissertation is the final requirement in completing the Ph.D.

Foreign Language

A speaking or reading knowledge of one foreign language is required.

Graduate Courses

201A Descriptive Multivariate Statistics I (4). Mathematical tools to organize and illuminate the multivariate methods. Multiple regression analysis, multi-dimensional scaling, and cluster analysis. Statistical computing via MDS(x), DMDP, and SPSS. Students must enroll in the laboratory section which meets on Wednesdays. Prerequisite: Social Sciences 100A-B-C or equivalent. Same as Social Ecology 290A and Management 290X.

201B Descriptive Multivariate Statistics II (4). Presentation of the principal methods of multivariate statistics including criteria for appropriate use and the interpretation of resulting measurements. Computer exercises are used to demonstrate concepts. Prerequisite: Social Sciences 201A, Social Ecology 290A, or Management 290X. Same as Social Ecology 290B and Management 290Y.

201C Sampling Techniques and Estimation Methods (4). A review of confidence interval estimates derived from simple random samples is followed by a representation of techniques for improving the precision of such estimates under the constraints of feasibility, cost, and time. Methods for dealing with bias and nonsampling errors are also considered. Outside speakers. Prerequisites: Social Sciences 100A-B-C or equivalent. Same as Social Ecology 290C and Management 290Z. Satisfactory/Unsatisfactory only.

201D Introduction to Biostatistics (2). An introduction to the principles and methods of biostatistics with application to the health sciences. Statistical concepts, terminology, and techniques employed in health science research to analyze data and report such analysis. Articles from health science research literature are used for illustration. Prerequisite: graduate standing or consent of instructor.

201G Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models.

201J Statistical Methods in Network Analysis (4). A practicum on network approaches to a classic topic in data analysis: the rectangular table or multivariate analysis. Programs on microcomputers are utilized. Students implement data-analytic studies using one or more of the methods. Prerequisite: graduate standing or consent of instructor.

201L Mathematical Tools for Network Analysis (4). A broad introduction to selected topics in algebra and discrete combinatorics with special emphasis on semigroups and graph theory. Acquaints students with the mathematical tools used in social networks analysis.

204A Algebraic Theories in the Social Sciences (4). Various applications of abstract algebra to the social sciences. The unifying mathematical framework is categorical algebra, including such basic ideas as category, functor, natural transformations, and universality. Examples drawn from, e.g., pattern recognition (group theory), formal languages and social relations (semigroups), and the general problems of inducing structure from behavior data. Requires some mathematical maturity, but no specific knowledge. Prerequisite: graduate standing or consent of instructor.

204D-E Von Neumann Games I, II (4-4). A substantive introduction to the mathematical theory of finite N-person von Neumann games. Games in extensive form, normal form, and characteristic form. Emphasis on developing various types of solution concepts for each of the three forms of games. Prerequisite: graduate standing or consent of instructor.

205C Alcohol and Behavior (4). Focuses on the effects of alcohol on behavior, with emphasis on memory and cognitive processes. Primary attention is given to research results and research potential. What studies have been done and what studies need to be done? Each student selects one area to review. Previous familiarity with the topic is not required. Prerequisite: graduate standing or consent of instructor.

208A-B Workshop on Dissertation Writing I, II (4-4). Conception, organization, and style. 208B focuses on individual writing.

209A-Z Special Topics in Mathematical Social Science (4). Current research in Mathematical Social Science. Topics vary.

210A-B-C Graduate Colloquium for Economics I, II, III (2-2-2) F, W, S. Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology. Prerequisite: admission to graduate program in Economics or consent of instructor. May be repeated for credit.

211A Mathematics for Economists (4). Gives students the mathematical background required for graduate work in economics. Topics covered include multivariate calculus, differential equations, and linear algebra. Prerequisite: graduate standing or consent of instructor.

212A-B-C Microeconomic Theory I, II, III (4-4-4) W, S. Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory. Prerequisite: graduate standing or consent of instructor.

213A Mathematical Statistics for Economists (4). Mathematical statistics necessary to prepare students for econometric study and applied work. Topics include probability theory, distributions, sampling, parametric interval and point estimation, statistical hypothesis testing, and nonparametric tests. Prerequisite: graduate standing or consent of instructor.

213B-C Econometrics I, II (4-4). Specification, estimation, and testing of econometric models. Main emphasis on linear simultaneous equations models. Time series, nonlinear models, and limited dependent variable models are covered. Prerequisite: Social Sciences 213A or equivalent.

213D-E Econometrics Laboratory (2-2). Discussion of problems in econometrics and their relationship to econometric theory. Instruction in the use of computers for applied econometric work. Prerequisite: concurrent enrollment in Social Sciences 213B-C.

213G Discrete Choice Econometrics (4). Specification, estimation, and testing of discrete choice models, with emphasis on cross-section application. Qualitative choice, limited dependent variables, sample selection bias, and latent variables. Students use computer packages to apply models to real data. Prerequisites: Social Sciences 213A and 213B.

213H Time Series Econometrics (4). Econometric analysis of time series data. Moving average and autoregressive series, regression analysis, Box-Jenkins techniques, computational methods, and causality conditions. Prerequisites: Social Sciences 213A, 213B-C.

214A-B Labor Economics I, II (4-4). Analytic and empirical study of labor markets. Topics include labor supply and demand, human capital, educational sorting, life-time earnings profiles, discrimination, unemployment, unions; several econometric techniques including combined time-series and cross-sections, sample selection bias, and switching regressions are taught as needed. Prerequisites: Social Sciences 111B and 211A or equivalent.

214C-D Industrial Organization I, II (4-4). Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. **214C:** Oligopoly, cartels, mergers, vertical integration, patents, innovation, antitrust, and regulation; **214D:** price flexibility and dispersion, auctions, search and industrial structure, intrafirm organization. Prerequisites: Social Sciences 111B and 211A, or equivalent.

214E Urban Economics I (4). Theoretical and empirical analysis of the economic functioning of urban areas. Urban economic development, location of firms and households, housing markets, urban public finance. Econometric estimation of hedonic price functions for housing. Prerequisites: Social Sciences 111B and 211A, or equivalent.

214G Transportation Economics (4). Economic analysis of intercity transportation. Cost measurement, applications of pricing principles, project evaluation, and economic regulation. Policy toward railroads, air passenger transport, and intercity highways. Prerequisites: Social Sciences 111B and 211A, or equivalent.

214H Economics of Urban Transportation (4). A sequel to Social Sciences 214E and 214G. Travel demand analysis including discussion of econometric techniques. Pricing and investment in urban transportation, effects of transportation on urban structure, selected policy issues. Prerequisite: Social Sciences 214E or 214G.

214J Information Economics (4). Study of information as an economic resource, focusing on principles which govern the production, distribution, and value of information. Impact of information structures on individual decision, corporate structure, and the operation of markets. Prerequisites: Social Sciences 111A-B-C and 211A, or equivalent.

214L Financial Economics (4). The modern theory of portfolio selection as an application of individual decision making under uncertainty. Implication for equilibrium financial asset pricing. Prerequisites: Social Sciences 111A-B and 211A or equivalent, and Social Sciences 212A-B.

214M Financial Markets (4). Roles, characteristics, policies of financial institutions, and behavior of capital markets. Attention to relationship between these aspects of the financial sector and federal monetary management and policy. Discussion of markets for specific instruments, such as federal funds, commercial paper, mortgages, and corporate bonds. Prerequisite: graduate standing or consent of instructor. Same as Management 241.

214N-O Public Choice I, II (4-4). Application of economics tools to understanding the behavior of democratic governments. Topics to be covered include Arrow's Impossibility Theorem, spatial voting models, the behavior of bureaucracies, the influence of special interest groups on policy, and analysis of the effects of electoral politics on public policy.

215A-B-C Macroeconomic Theory I, II, III (4-4-4) F, W, S. Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models. Prerequisites: Social Sciences 111C and concurrent enrollment in Social Sciences 211A.

217A-Z Topics in Economics (4) F, W, S. Study of current literature on topics in advanced economic analysis. Subject matter varies; may include microeconomics, macroeconomics, mathematical economics or econometrics as arranged by the instructor and specified in advance. Prerequisite: consent of instructor. May be repeated for credit.

219A Research Writing in Economics (4). For graduate students in economics who are writing their required research paper in an applied field. How to write an original paper in economics, guidance for specific papers. Prerequisite: admission to the graduate program in Economics.

220A-B-C Research Seminar in Politics, Society, and Social Issues (1.3-1.3-1.4) F, W, S. Seminar, two hours. Weekly reports and colloquia by faculty, students, and visitors. Students required to report on one research project over the course of three quarters. Prerequisite: admission to graduate program in Social Sciences or consent of instructor.

221A-B-C Foundations of Modern Political Science I, II, III (4-4-4). Tutorial seminars on the foundation of modern political science, major issues in micropolitics, major issues in macropolitics. Prerequisites: graduate standing or consent of instructor. Required of all first-year graduate students in political science.

221D-E-F Theoretical Approaches to Urban and Transportation Analysis (4-4-4). Selected theoretical perspectives on urban and transportation analysis based upon the study of human behavior. Assists graduate students and faculty associated with the Institute of Transportation Studies to formulate and complete research programs emphasizing interdisciplinary collaboration in the social sciences. Research findings are presented by students, faculty, and

invited guests. Prerequisite: graduate standing or consent of instructor.

221G Issues in American Politics and Government (4). Seminar covering major issues in the study of American political behavior and institutions. Prerequisite: graduate standing or consent of instructor.

221U Research Seminar in Electoral Behavior (4). Students will be expected to design and carry out an original research project in the field of electoral behavior, analyzing data from recent national election studies. Emphasis will be placed on learning techniques of data analysis and presentation. Prerequisite: graduate standing or consent of instructor.

222A-B Seminar in Authority Relations I, II (4-4). Examination of authority relations in workplaces and educational institutions in several societies. Emphasis on adaptation to unfamiliar contexts and the possibility of "self-management" in organizations. Concurrent with Social Sciences 122H-I.

223A-B-C Theories of Political Structure (4-4-4). Examination of alternative theories of political structure with particular attention to those found among sociologists such as Parsons, anthropologists such as Lévi-Strauss and Nadel, psychologists such as Piaget, and Marxists such as Althusser and Poulantzas. Objective is to test the utility of these approaches for the construction of a theory of political structure. Prerequisite: graduate student or consent of instructor.

223D Comparative Political Institutions and Processes I (4). An introduction and overview of comparative institutions and processes at the national and cross-national level. Prerequisite: graduate standing or consent of instructor.

223G Foundations of Modern Political Science (4). Provides an introduction to major works by highly influential scholars such as de Tocqueville, Marx and Engels, Mosca, Durkheim, Weber, Wallas, and Lasswell, that constitute the foundation of much contemporary political science. Prerequisite: graduate standing. Concurrent with Social Sciences 123H.

224B Methods of Political Inquiry (4). A basic introduction to standard research techniques in political science. Prerequisite: undergraduate-level statistics or mathematics course or consent of instructor.

224C Critical Political Theory (4). An in-depth study of current political theories which are critical of the acceptance of mainstream political, economic, and sociological discussion of capitalist, democratic societies. Focus is on two theorists in particular: C.B. MacPherson and William E. Connolly; however, other theorists are covered. Prerequisite: graduate standing or consent of instructor.

224E Philosophy of Science (4). An introduction to the philosophical underpinnings of the scientific method of analysis and its applicability to the social sciences. Focuses on important topics and readings by authors such as Hempel, Popper, Kuhn, Feigl, Nagel, Suppe, and Shapiro. Prerequisite: graduate standing or consent of instructor.

224S Participation and Equality (4). Examines authority relations in workplaces and schools, addressing two specific questions: to what extent can schemes of workers' participation in workplace governance succeed and form general participatory dispositions, and does the governance of classrooms and schools make possible increased equality through increased access to schooling? Concurrent with Social Sciences 124S and 162V.

225F Human Nature, Altruism, and Public-Spirited Behavior (4). Philosophical and behavioral discussions of altruism and cultural influences on public-spirited behavior. Prerequisite: graduate standing or consent of instructor.

226C Political Economy (4). Introduction to the many relationships between economics, politics, and government, both within and among societies. Areas covered include contemporary American politics, American history, political theory, ideology, labor, property,

multinational corporations, economic regulation, international relations, and the Third World. Prerequisite: graduate status or consent of instructor.

226E Revolutions and Collective Political Violence (4). The major theoretical issues raised by revolutions and other forms of collective political violence: their role in history; their causes; the "process" of revolutions from remote symptoms of unrest to their aftermaths; practices of revolution and insurgency; and the personality of revolutionary leaders. Concurrent with Social Sciences 126X.

226S Rationality in Social Science (4). Discussion of the history of the paradigm, how it has been refined into the cost-benefit model as it has been applied to political decision making; identification and examination of the main assumptions underlying the model; suggested modifications in the rationality paradigm. Prerequisite: graduate standing or consent of instructor.

227D Socio-economic and Political Change (4). Survey and discussion of the major contributions to the literature on the relationship between socio-economic development and political change. Comparison of theoretical (modernization, dependency, world systems theories) and methodological approaches (crossnational data analysis, comparative-historical studies). Emergence and breakdowns of democratic regimes in developed and developing countries, revolutions, and political developments in advanced industrial societies. Prerequisite: graduate standing or consent of instructor. Same as Social Sciences 263L.

227E Advanced Macropolitics (4). Examination of the nature of "positive theories" and of three major approaches to constructing such theories in macropolitics: formal-legal study, political-culture inquiry, and rational-choice theory. General discussion of approaches with specific reference to explaining political stability and instability, legitimacy, and dissent. Concurrent with Social Sciences 122L.

229A-Z Special Topics in Politics and Society (4). Current research in politics and society. Topics vary.

230A-B-C Current Research in Social Relations (1.3-1.3-1.4) F, W, S. Research seminar in which a number of Social Relations faculty members present and discuss their current research.

230J-K-L Social Relations Dissertation Seminar I, II, III (4-4-4) F, W, S. Research design, problem conceptualization, and advanced data analysis in the area of social relations. Emphasis on methods of analysis in ethnography, cross-cultural research, and quasi-experimental research. Prerequisite: graduate standing or consent of instructor.

230X-Y-Z Proseminar in Social Relations I, II, III (4-4-4) F, W, S. Gives first-year graduate students a general background in theory and research and helps them prepare a long research paper. By the end of spring quarter, students must complete their paper and give a public lecture on its contents. The readings covered in the seminar are tailored to fit the students' research interests. A core course for first-year graduate students in social relations and anthropology. Prerequisite: graduate standing or consent of instructor.

231A-B-C Systems of Belief I, II, III (4-4-4). Approaches to exploring and understanding particular belief systems in unfamiliar cultures.

232A-B Advanced Experimental Anthropology (4-4). This seminar deals with the major topics in experimental anthropology. It has a heavy anthropological emphasis. Individual research projects required from each participant. Prerequisite: consent of instructor.

233A-B Mathematical Anthropology I, II (4-4). A variety of substantive problems dealt with by anthropologists and what can be done through formalizing this organized complexity, using mathematical, statistical, and computer-based techniques. Models of the structure, process, and evolution of cognitive, social, and ecological aspects of culture considered.

236A Content Analysis and Research Information Management (4). Various methodologies of discourse and content analysis. Techniques include scoring, TATs and folktales for power and intimacy motivation, analysis of interview protocols, event structure analysis in narrative, conversational analysis, categorizing emotional content, scoring for levels of ego development, using computers for content analysis. Prerequisite: graduate standing or consent of instructor.

236B Urban Anthropology and International Migration (4). Examines urban society and migration. Favors anthropological perspectives, but draws on sources from a number of disciplines. The nature of urban society, theoretical explanations for international migration, contemporary sending communities, economic vs. political migration, the female experience in migration, and the social integration and cultural adaptation of migrants in receiving communities. Prerequisite: graduate standing or consent of instructor.

236E Cultural Pathology I (4). Investigates ways of measuring adaptive potential in different cultural groups and testing psychosomatic linkages between cultural health and illness. Prerequisite: graduate standing or consent of instructor.

236H Cultural Dynamics (4). Seminar on the dynamics of culture as analyzed in the interplay among values, current social situation, and the self. Theories of cultural evolution, cultural transmission, and derived theories such as adaptive potential are discussed in connection with ongoing research projects. Prerequisite: graduate standing or consent of instructor.

236R Health and Social Relations (4). Comparative approach to health, illness, and curing from a social science perspective. Readings report on health issues in different societies which range from contemporary United States to modern tribespeople from lowland Venezuela. Prerequisite: graduate standing or consent of instructor.

237D Family and Life History (4). Interdisciplinary and comparative work in family and life history. Prerequisite: graduate standing or consent of instructor.

239A Topics in Anthropology (4-4-4) F, W, S. Current research in anthropology is presented. Topics vary.

240A-B-C Cognitive Sciences Research Seminar (1.3-1.3-1.4) F, W, S. Weekly reports and colloquia by faculty, students, and visitors. Prerequisite: admission to graduate program in Cognitive Sciences or consent of instructor.

241A Introduction to Mathematical Statistics (4). Probability spaces, random variables, random sampling, maximum likelihood estimation, central limit theorems, hypothesis testing. Prerequisites: calculus and elementary statistics.

241B Experimental Design (4). Discussion of the logic of experimental design and inferential statistics. Presentation of mathematical ideas from behind analyses of variance and covariance, analysis of counted data. Main emphasis on research applications rather than mathematical formulations. Prerequisite: graduate standing or consent of instructor.

241C Computational Models of Language and Cognition (4). Introduction to the theory of abstract machines; formal languages and their relationship to abstract machines; learnability of families of languages under various conditions of input information and processing capability; computational models of language processes. Prerequisite: graduate standing or consent of instructor.

242A-B-C Proseminar in the Cognitive Sciences (4-4-4) F, W, S. Year-long intensive introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students. Prerequisite: graduate standing or consent of instructor.

243G-H-I Observer Theory I, II, III (4-4-4). Provides framework for mathematical analysis of perception/cognition and its relation to the physical world. Permits a unified treatment of perceptual and physical interactions and lays the foundation for a nondualistic, nonreductionistic science. Mathematical aspects include a study of Markovian dynamic systems. Prerequisite: graduate standing or consent of instructor. Same as Mathematics 216A-B-C.

243M Social Psychology of Networks (4). Review of network models used in small group and organizational research. Discussion of social psychology literature relevant to the network study of cognitive social structure, exchange and communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues. Prerequisite: graduate standing or consent of instructor.

244A Linguistic Theory (4). An analysis of recent developments in linguistic theory. Discussion centers on the formulation of the goals of linguistic theory and on the use of linguistic data in relationship to these goals. Prerequisites: Social Sciences 141A or equivalent; graduate standing or consent of instructor.

244B Seminar in Semantics and Cognitive Structure (4). Concentrates on recent research in semantic and cognitive structure. Prerequisite: some background in linguistics or psycholinguistics.

247B Research Seminar in Psycholinguistics (4). This seminar consists of informal presentation and discussion of ongoing research in psycholinguistics on the part of the participants. Those people wishing to take the course who are not currently engaged in a research project will design and execute one. Prerequisites: consent of instructor and graduate standing.

247C Language and Its Use: A Seminar in Pragmatics (4). This seminar covers selected topics dealing with the relationship between language and language use, including the work of some of the ordinary language philosophers, more recent developments in linguistics, and relevant thrusts in psychology. Prerequisite: consent of instructor.

249A Topics in Cognitive Sciences (4-4-4) F, W, S. Current research in cognitive sciences is presented. Topics vary.

250C-D-E Spatial Representation in Cognitive Sciences (4-4-4). In cognitive sciences, it is important to disclose information hidden in complex data. The information is often captured in spatial form such as a configuration of points in an appropriate space. Two methods widely used for this purpose, factor analysis and multidimensional scaling, will be discussed from the beginning. Special emphasis will be placed upon nonmetric versions of these methods. Prerequisite: graduate standing or consent of instructor.

251A-B Mathematical Models of Cognitive Processes I, II (4-4). Mathematical models of various cognitive processes that have been developed mostly since 1960, including learning, memory, perception, psycholinguistics, and problem solving. Models are formulated in different mathematical languages: calculus, algebra, logic, probability, and computer. Difficulties in testing and validating models are discussed. Prerequisite: graduate standing or consent of instructor.

253A-B-C Visual Perception I, II, III (4-4-4). General introduction to visual perception for graduate students. Current research topics emphasized. Prerequisite: graduate standing or consent of instructor.

253D-E-F Electro-optical Instrumentation Related to the Human Eye (4-4-4). Covers basic principles of the design of electro-optical systems and the relevant parameters of the human visual systems.

254A Attention (4). Examination of the descriptive and functional properties of attention, especially in visual perception. Topics include selection, orienting to and focusing on objects and parts of objects, acuity, priming, switching attention, capacity limitations, effort, and automatic processing. Prerequisite: graduate standing or consent of instructor.

255A-B Artificial Intelligence and Human Vision I, II (4-4). An introduction to computational investigations of human visual perception. Topics include edge detection, stereo, 3-D structure from 2-D motion, shape from shading and contour, shape recognition, and philosophy of the computational approach. Prerequisites: graduate standing or consent of instructor.

261M Microcomputers in Social Science Research (4). Provides elementary instruction on the use of microcomputers for statistical analysis, network analysis, and graphics in social research. Prerequisite: Graduate standing or consent of instructor.

262A-B-C Research Methodology I, II, III (4-4-4). Seminar to help students focus on their dissertation topics and to help the instructors audition their current research interests. Graduate students at

all levels and instructors make presentations describing their ongoing work.

263A Social Movements and Public Policy (4). Several recent changes in the U.S. have resulted from the interaction of a social movement, a new ideology, and government policies. Focuses on how these factors have changed the status of women. Changes in the status of minority groups also are considered.

263B Seminar in Social Structure (4). Seminar, three hours. Alternative theoretical approaches and research strategies for examining topics such as stratification, modernization, and socialization. Readings include Marx, Weber, Dahrendorf, Sahlins, and Lenski.

263F Feminist Theory (4). Analyzes current issues and theoretical debates in feminist research, primarily in the social sciences. What is a useful definition of feminism? Similarity vs. difference—is it useful to consider the experiences and problems of women in general? How can we integrate gender, class, and race? Do we need special research methods to explore feminist questions? Relates these general issues to specific areas of interest to students. Prerequisite: graduate standing or consent of instructor.

263G Participatory and Feminist Research (4). Methods of participatory research developed by feminists, Paulo Freire, and others. These methods are non-hierarchical, focused on everyday experience, and action-oriented. Each student does a preliminary project with the members of a community; projects may focus on family and gender, racism and ethnicity, oppression in the workplace, or other topics. Prerequisite: graduate standing or consent of instructor.

263H Development and Social Change (4). Examines both classical and contemporary macrosociological theories of modernization and development. Competing perspectives are discussed and evaluated in light of their ability to explain concrete problems of underdevelopment such as economic stagnation, social inequality, political instability, and overpopulation. Prerequisite: graduate standing or consent of instructor.

263L Socio-economic and Political Change (4). Survey and discussion of the major contributions to the literature on the relationship between socio-economic development and political change. Comparison of theoretical (modernization, dependency, world systems theories) and methodological approaches (cross-national data analysis, comparative-historical studies). Emergence and breakdowns of democratic regimes in developed and developing countries, revolutions, and political developments in advanced industrial societies. Prerequisite: graduate standing or consent of instructor. Same as Social Sciences 227D.

264A Seminar in Structuralism and Semiotics (4). A fresh look at structuralism and semiotics to determine whether there are some symbolic systems (e.g., myths, designs, food, clothes) that are enough like language to profit from the comparison. Prerequisite: graduate standing or consent of instructor.

270A Proseminar in Expressive Forms (4). A survey of the literature pertaining to the cultural and social analyses of expressive forms, with an emphasis upon general theoretical issues. Required of all Comparative Culture graduate students.

271A-B-C Colloquium on Dominant American Culture I, II, III (4-4-4) F, W, S. Survey of the literature and interpretations of major American institutions and lifeways—demography, population, movements, and settlement patterns; the family, education, and enculturation processes; law and politics, economic life, religion and belief systems, science and technology; the mass media and the popular arts. Required of all Comparative Culture graduate students.

273A Proseminar in Social Inquiry (4). A survey of the philosophy and conceptual and methodological tools of the social sciences, with emphasis on the problems of interdisciplinary research. Required of all first-year Comparative Culture doctoral students.

274 Culture-Specific Colloquia. Each is a two-quarter survey of the key literature on migration, historical position within the political economy, major federal and state legislation that pertain to the groups, race relations, demography, population movements, economy, family and households, enculturation, sodalities and voluntary organizations, political organizations and politics, religion, ideology, ceremonialism, and the popular arts. Required of all Comparative Culture graduate students.

274A-B Afro-American Culture I, II (4-4)

274C-D Asian-American Cultures I, II (4-4)

274E-F Hispanic-American Cultures I, II (4-4)

274G-H Native American Cultures I, II (4-4)

275A-B-C Methods of Social Inquiry I, II, III (4-4-4). **275A:** Focuses on qualitative methods including comparative historical research, participation observation, and interviewing techniques. **275B:** Concentrates on survey research techniques, including cross-cultural survey, sampling questionnaire construction and coding, and analysis of data. **275C:** Application of mathematical models to the analysis of the data. Required of all Comparative Culture graduate students emphasizing social inquiry. Prerequisite: graduate standing or consent of instructor.

276A-B-C Seminar in Expressive Forms of American Culture I, II, III (4-4-4). Introductory survey of major interpretations of expressive forms produced by cultural groups found in the United States, together with significant examples of those expressive forms. Topics include literature, visual arts, folklife and popular culture, myth, and ritual. **276A:** Focuses on expressive forms of dominant American culture. **276B-C:** Deals with Afro-American, Asian-American, Hispanic-American, and Native American cultures. Required of all Comparative Culture graduate students emphasizing expressive forms.

279A-Z Special Topics in Comparative Culture (4). Current research in comparative culture. Topics vary from quarter to quarter. Prerequisite: graduate standing or consent of instructor.

280A-B-C Colloquium in Social Networks (1.3-1.3-1.4) F, W, S. A seminar drawing on visiting scholars and local faculty designed to keep students abreast of current developments in Social Networks research.

281A Network Theories of Social Structure (4). Explores communicative, social, political, economic, and other flows of behavior using foundational network concepts and measures such as centrality, group, role, pattern, and system. What is social structure, what are the processes that generate structures, and what are the behavioral consequences of structural rather than individual dispositional properties?

282A Kinship Structures (4). The kinship systems of the world offer many interesting structures for algebraic analysis. The first such analysis was done for the Australian marriage class systems using the theory of permutation groups. This analysis will be extended to cover more aspects of marriage class structures and will be generalized to such systems as the Crow-Omaha.

283A Interaction Models (4). Human groups can be considered as finite systems of individuals some of whom interact in pairs. Each individual is assigned an attribute from a ring of values, and the set of these attributes is called the "state" of the system. States, together with graphs on individuals, are used to define stochastic processes. These processes are used to model such phenomena as ferromagnetism in physics and clique formation in social science.

284A-B Research Design I, II (4-4). Focuses on data collection, organization, and analysis in natural (ethnographic or quasi-experimental) settings. Data collection processes such as interviewing, participant-observation, behavior observation, and questionnaires. Research design issues such as sampling, control groups, longitudinal research, and multimethod approaches. Emphasis on relationships and systematic approach to integration of qualitative and quantitative analyses.

285A Topics in Graph Theory (4). A detailed examination of selected topics in the theory of graphs, digraphs, and hypergraphs with a view toward applications to problems of social networks analysis.

290 Dissertation Research (4) F, W, S. May be repeated for credit. Prerequisite: consent of instructor.

291 Directed Reading Examination Preparation (4) F, W, S

298 Self-Directed Study (1-12) Summer. May not be applied towards residency requirements or toward total units required for a degree. May be repeated for credit. Prerequisite: graduate standing.

299 Independent Study (4) F, W, S. May be repeated for credit.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

Department of Information and Computer Science

Leon J. Osterweil Chair

Lubomir Bic, Ph.D. University of California, Irvine, *Associate Professor of Information and Computer Science and of Electrical Engineering* (parallel processing; multiprocessor architectures; semantic and object-oriented database systems)

Alfred M. Bork, Ph.D. Brown University, *Professor of Information and Computer Science* (computer-based learning; production systems for computer-based learning; screen design; simulation; computer graphics)

Michael Dillencourt, Ph.D. University of Maryland, *Assistant Professor of Information and Computer Science* (computational geometry, analysis of algorithms, data structures)

Julian Feldman, Ph.D. Carnegie Institute of Technology, *Professor of Information and Computer Science* (management of computing resources; problems involved in managing the computer resources of an organization, including resource allocation and financing organizations; the teaching of programming, and development of techniques which will facilitate the learning of programming)

Peter Freeman, Ph.D. Carnegie-Mellon University, *Associate Professor of Information and Computer Science* (software engineering methods, tools, and management, especially for analysis and design; reusability; study of design representation; development of design training methods)

Daniel D. Gajski, Ph.D. University of Pennsylvania, *Professor of Information and Computer Science and of Electrical Engineering* (parallel algorithms and architectures; silicon compilation; expert systems for design; science of design)

Richard H. Granger, Ph.D. Yale University, *Associate Professor of Information and Computer Science and Social Sciences* (cognitive science; natural language processing; memory models)

Daniel Hirschberg, Ph.D. Princeton University, *Professor of Information and Computer Science* (analysis of algorithms; concrete complexity; data structures; models of computation)

Donald Hoffman, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Psychology and Information and Computer Science* (human and machine vision; cognitive science; artificial intelligence)

Dennis F. Kibler, Ph.D. University of California, Irvine, *Associate Professor of Information and Computer Science* (learning control knowledge; planning and problem solving; parallel processing of logic programs)

John Leslie King, Ph.D. University of California, Irvine, *Professor of Information and Computer Science and Management* (economics of computing; policies for computer management and use in organizations; public policy and social impact aspects of computer use)

Rob Kling, Ph.D. Stanford University, *Professor of Information and Computer Science and of Administration* (social analysis of computing—computer technology and public policy, sociology of computing)

Kenneth L. Kraemer, Ph.D. University of Southern California, *Professor of Management and Information and Computer Science, and Director of the Public Policy Research Organization* (economics and management of computing; organizational and social impacts of computing; information technology and public policy; management information systems/decision support systems)

Patrick Langley, Ph.D. Carnegie-Mellon University, *Associate Professor of Information and Computer Science* (machine learning and discovery; cognitive architectures; intelligent teaching systems)

Nancy Leveson, Ph.D. University of California, Los Angeles, *Associate Professor of Information and Computer Science* (information systems design; software safety and reliability; programming language semantics; database systems)

George S. Lueker, Ph.D. Princeton University, *Professor of Information and Computer Science* (computational complexity; probabilistic analysis of algorithms; data structures)

Alexandru Nicolau, Ph.D. Yale University, *Associate Professor of Information and Computer Science* (architecture, parallel computation, and programming languages and compilers)

Paul O'Rourke, Ph.D. University of Illinois, Urbana, *Assistant Professor of Information and Computer Science* (machine learning; automated reasoning)

Leon J. Osterweil, Ph.D. University of Maryland, *Chair and Professor of Information and Computer Science* (software process, software environments, software testing and analysis, and combinatorics)

Michael J. Pazzani, Ph.D. University of California, Los Angeles, *Assistant Professor of Information and Computer Science* (human and machine learning, natural language understanding, cognitive science)

Debra J. Richardson, Ph.D. University of Massachusetts, Amherst, *Assistant Professor of Information and Computer Science* (software engineering; program testing; life-cycle validation; software environments)

Richard W. Selby, Ph.D. University of Maryland, *Assistant Professor of Information and Computer Science* (software engineering testing; software metrics; empirical evaluation of software methodologies)

Jack Sklansky, Ph.D. Columbia University, *Professor of Electrical Engineering, Radiological Sciences, and Information and Computer Science* (computer vision; pattern recognition; biomedical information engineering)

Thomas A. Standish, Ph.D. Carnegie Institute of Technology, *Professor of Information and Computer Science* (programming environments; data structures)

Susan Leigh Star, Ph.D. University of California, San Francisco, *Assistant Professor of Information and Computer Science and of Social Science* (social choices in system design; computer-assisted design; sociology of technology and sciences)

Tatsuya Suda, Ph.D. Kyoto University, *Assistant Professor of Information and Computer Science* (computer networks; distributed systems; performance evaluation)

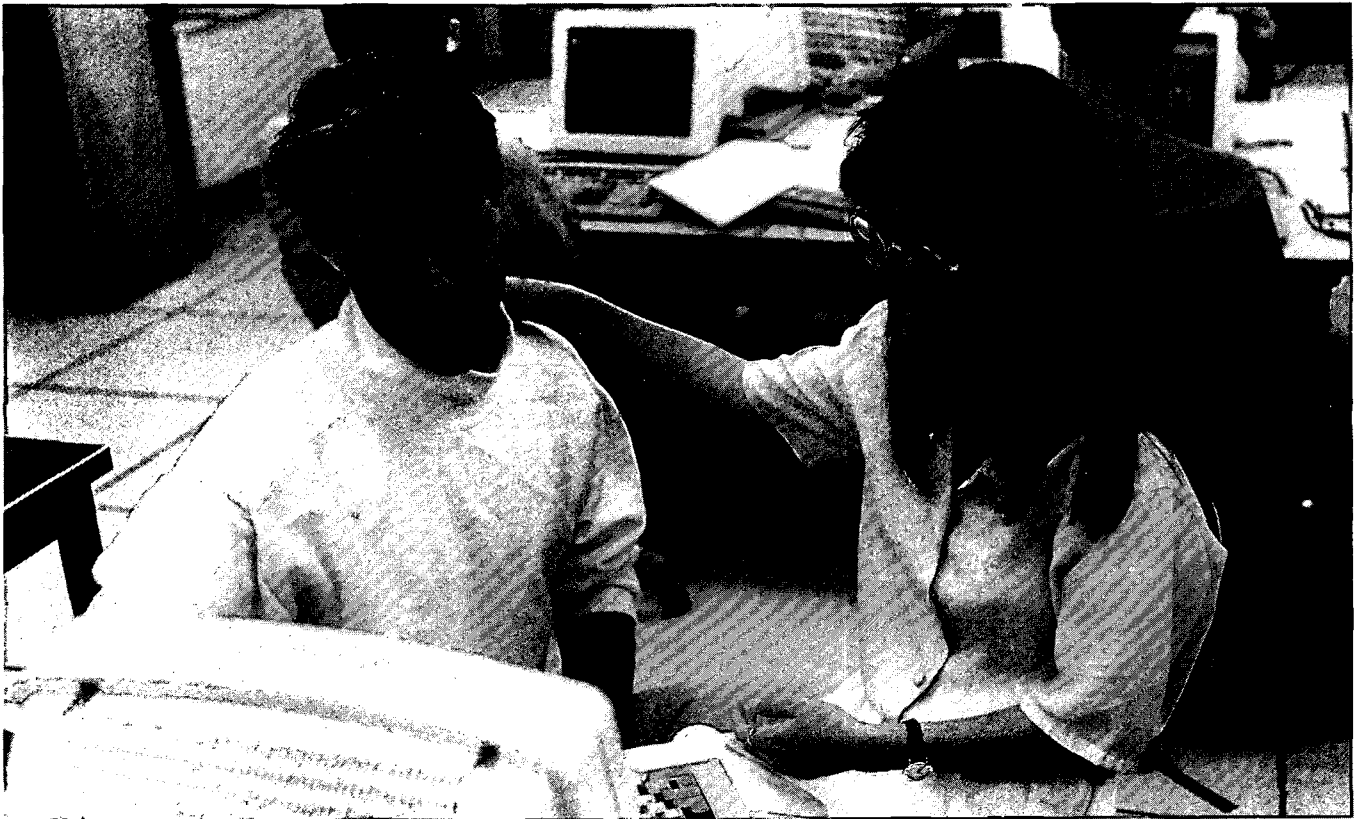
Richard Taylor, Ph.D. University of Colorado, *Associate Professor of Information and Computer Science* (programming environments; verification and testing of programs; concurrent processes)

Nicholas P. Vitalari, Ph.D. University of Minnesota, *Associate Professor of Management and Information and Computer Science* (systems analysis and design; management information systems; social analysis of computing)

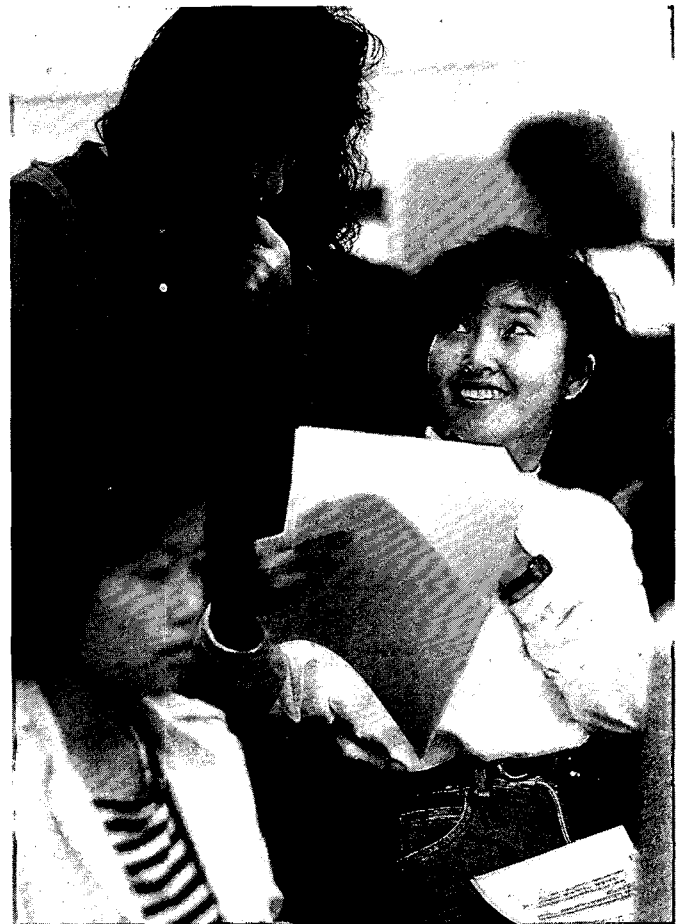
The development of the modern digital computer has made possible the solution of large-scale information processing problems in science, industry, and government. These problems include predicting the orbit of a satellite, simulating the economy, keeping track of inventories, and sending mail electronically. Such problems are solved by having the computer execute a procedure—a sequence of information processing operations including, but not limited to, arithmetic operations, testing and comparing numbers and representations of alphabetic information, and changing the sequence of operations within the computer. Information and computer science is concerned with the development of procedures which are effective and efficient, languages suitable for stating these procedures, systems for executing procedures, and with the study of the social setting in which procedures are used.

The implications of research in information and computer science extend beyond direct applications of the modern digital computer. Many animate and inanimate systems can be usefully viewed as information processing systems and analyzed in terms of the way they represent, store, and process information. Thus, information and computer science provides a point of view, an approach, for studying phenomena in many sciences.

Computing resources available on the campus include interactive access to the systems in the UCI Computing Facility—a DEC VAX 11/780, 11/785, and 8350 (VMS), and a Sequent Symmetry shared memory multiprocessor (Unix).



The undergraduate major in Information and Computer Science provides students with the opportunity to study the underlying principles, current practices, and probable future trends of computer science. The graduate program is research-oriented and encourages students to work together with faculty to solve advanced problems.



Instructional computing resources within the Department of Information and Computer Science (ICS) include four micro-computer laboratories using AST Premium/286 PCs, Macintosh II workstations, and Macintosh Pluses. An advanced workstation laboratory comprising 10 Sun 3/50 workstations also is available. Upper-division students have access to a Sequent Symmetry Unix timesharing machine. Additional departmental resources for research include a second Sequent Symmetry, 10 Integrated Solutions workstations, and over 100 Sun workstations.

Students who transfer to UCI in fall 1990 or thereafter will be held to the following requirements:

1. One year of college mathematics, consisting of courses equivalent to Mathematics 6A-B-C. If these courses are not available, students should take first-year calculus.
2. Completion of one year of computer science courses, including a programming course involving concepts such as are found in Pascal, Ada, or another modern, high-level language. Programming-only courses in languages such as BASIC, COBOL, and FORTRAN are not sufficient.
3. Satisfaction of the lower-division writing requirement (one year of college English composition).

Note: The lower-division requirements in ICS consist of five courses which must be taken in sequence and completed before going on to upper-division course work. Students who transfer to UCI as juniors and who must complete any or all of this sequence will therefore find that it will take longer than two years to complete their degrees.

Alternately, lower-division eligible transfer students can come to the campus without declaring a major, take the courses necessary to meet the ICS change-of-major requirements, and then apply for a change of major.

On the basis of our experience over the past several years, we anticipate that the number of incoming freshmen and advanced-standing students who elect ICS as a major will exceed the number of positions available. In this case, incoming applicants who elect ICS cannot all be admitted to the major.

To ensure that their application is considered for the fall quarter, students should be sure to file their application by November 30 of the prior year. The selection criteria include grades, test scores, and affirmative action considerations.

Students interested in using computers as an adjunct to their major field of study may enroll in the introductory programming sequence (ICS 21, 22, 23).

Degrees

Information and Computer Science B.S., M.S., Ph.D.

Honors

Honors at graduation, e.g., *cum laude*, *magna cum laude*, *summa cum laude*, are awarded to approximately 12 percent of the graduating seniors. Students are nominated for honors based on criteria such as grade point average (including overall, ICS, mathematics); number of upper-division ICS courses completed beyond the minimum; courses taken outside ICS beyond required breadth; and research activities. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at a University of California campus. To be considered for honors, students must file their application for graduation by March 31.

Careers for the ICS Major

Students with undergraduate degrees in Information and Computer Science have been successful in finding career

opportunities in recent years. Entry-level positions have included programming, systems analysis, marketing, and sales support. The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

A Bachelor's degree in Information and Computer Science can be part of a preparatory program for graduate work in computer science or a related field.

Undergraduate Program

The major in Information and Computer Science (ICS) provides serious students the opportunity to study the underlying principles, current practice, and probable future trends of computer science. Just as it is important for students to acquire a broad and basic education in the major segments of modern academic study, it is essential that they obtain an educational foundation that will permit them to continue to learn and keep up with the expanding field of computer science. It is this focus on foundations for lifelong learning that is the hallmark of the ICS undergraduate program.

The ICS curriculum enables students to study basic concepts and practice of data organization, algorithm design, organization of systems (hard and soft), software system design and construction, theoretical models and analysis, artificial intelligence, and the nature of the personal, social, and organizational impact of computers. In the process of mastering the ICS curriculum, students learn several current programming languages, operating systems, support tools such as graphics packages, and hardware systems. Students also learn to use various current systems aimed at improving personal productivity.

These objectives provide a basis for professional work and graduate study in computer science and sophisticated applications of computers. While many ICS graduates are successfully pursuing careers in a variety of fields, including many kinds of applications, the curriculum focuses on the underlying principles of computer science rather than on specific applications. Students whose interests are primarily applications-oriented are encouraged to pursue in-depth study in another field, combined with a selection of basic courses in ICS.

Note: The award of a B.S. degree in ICS requires that students complete the course requirements for the degree *and* that they be enrolled in the ICS major. Students who would like to change their major to ICS should contact the ICS Undergraduate Counseling Office to discuss their plans.

Students enrolled in other degree programs who are interested in digital computer programming will normally begin their studies with Introduction to Computer Science I (ICS 21) and continue in the programming sequence with Introduction to Computer Science II and III (ICS 22 and 23) as far as their interests require and their programs permit. Students who are doing, or planning to do, extensive work with numerical problems are advised to consider courses in numerical analysis, statistics, probability, or other applied mathematics areas.

Students interested in courses in computer engineering and digital systems should consult the list of courses offered by the School of Engineering. Students can declare a double major in Engineering and ICS; early consultation on such a double major is advisable.

The ICS Undergraduate Counseling Office is staffed by professional academic counselors and peer advisors. These individuals are available to assist students with program planning, questions on University and departmental policies and procedures, progress toward graduation, and other questions that arise in the course of a student's education. Faculty also are available for advising, generally for suggestions of additional course work in the student's area of specialization and on preparation for graduate school.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

Information and Computer Science Major Requirements

Lower-division (these must be completed prior to taking required upper-division ICS courses): Mathematics 6A-B-C and 2A-B-C; ICS 21, 22, 23, 51, 52.

Upper-division: ICS 121, 131, 141, 151, 161, 171; two projects courses selected from ICS 125B, 135, 145A or B, 155A or B, 165, 175; one course in each of two areas, selected from ICS 132, 142 or 143, 152, 162, 172; three upper-division mathematics courses selected from the following list, including at least two courses with the same number (Mathematics 120 and 121 are considered to have the same number): Mathematics 105A-B-C and 105LA-LB-LC, 120 and 121A-B, 129A-B-C and 129LA-LB-LC, 130A-B-C, 131A-B-C and 131LA-LB-LC, 140A-B-C, 141A-B, 142A-B-C, 143A-B-C, 144A-B, 150A-B-C, 162A-B.

Honors Program in Information and Computer Science

The honors program in ICS provides an opportunity for selected students majoring in ICS to pursue advanced work in one of the research areas in the Department. Admission to the program is based on a formal application normally submitted at the end of the sophomore year. Entering transfer students who have not completed all lower-division work may submit applications at the end of their first year at UCI, providing the conditions for application have been satisfied.

Applications are available each year beginning May 15 and must be submitted by June 15 to ensure consideration. For an application to be considered, three conditions must be met (although exceptions may be granted in unusual circumstances): (1) achievement of an overall grade point average of at least 3.2; (2) completion of the required lower-division ICS courses with a grade point average of at least 3.5; and (3) completion of Mathematics 6A-B-C with a grade point average of at least 3.5. In selecting students for invitation to join the honors program, the Department considers evidence of the student's ability and interest in research. Successful completion of the program requires participation in the ICS Honors Seminar (ICS 197) and a minimum of two quarters of independent, supervised, honors-level work (ICS 198). The research may be used to satisfy one of the projects courses required for the major.

The 3-2 Program with the Graduate School of Management

Outstanding students who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the

Graduate School of Management section for additional information.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61-62.

Graduate Program

Master of Science Program

The Master of Science degree in Information and Computer Science is awarded only to Ph.D. students who complete necessary requirements. Students are not admitted for graduate study leading only to the Master's degree.

Ph.D. Program

The graduate program in Information and Computer Science leads to a Ph.D. degree. The program is research-oriented and encourages students to work together with faculty to solve advanced problems in computer science. Current research activities include analysis of algorithms, artificial intelligence, computer systems design, programming environments, software engineering, computer-aided instruction, and the study of the interrelation of computing, organizations, policy, and society. The Department receives substantial extramural funding. The Ph.D. program is designed for full-time study, and can be completed in five to six years, depending upon the focus of research.

Admission

Applications are evaluated on the basis of the student's prior academic record and potential for creative professional contributions. Applicants are expected to have good skills in computer programming and skills in mathematics equivalent to those obtained by students who complete college-level courses in logic and set theory, analysis, linear algebra, and modern algebra or probability and statistics. Computer science undergraduate training is not required, but some familiarity with machine organization, data structures, software systems, and formal models is helpful.

Applicants should take both the GRE General Test and the GRE Subject Test in Computer Science. Personal interviews are desirable but not required. Additional information about the graduate program in Information and Computer Science and application forms may be obtained by writing to the Graduate Counselor in the Department.

Financial Assistance

Financial assistance is available to students in the form of teaching and research assistantships. There are some research and teaching assistantships available for the summer as well. More than half of the doctoral students in residence receive financial assistance.

General Requirements for the Ph.D.

The Ph.D. program has three phases.

Phase I. Breadth: The purpose of the breadth phase is to develop the student's understanding of broad areas in computer science. Understanding is certified by satisfactory performance in core courses. Nine graduate courses must be taken as designated by the faculty, with no grade below a B. These courses include four core courses plus one course from each of the five concentrations. Students must complete Phase I by the end of their second year.

Phase II. Depth: The purpose of the depth phase is to develop research skills and creative problem solving ability. The student must select an area of specialization and

1. demonstrate deep understanding of that area by satisfactory performance in two advanced courses and on a written comprehensive examination
2. pass one other advanced course of the student's choice
3. demonstrate research ability by preparing a survey paper and a research paper of publishable or near-publishable quality
4. present a research colloquium
5. receive approval from the faculty to take a Candidacy Oral Examination
6. pass the Candidacy Oral Examination conducted by a formal candidacy committee appointed by the Dean of Graduate Studies.

The area of specialization is normally one of the Department's five concentrations: computer systems design; software; theory of algorithms and data structures; artificial intelligence; computing, organizations, policy, and society (CORPS).

However, an area of specialization other than one of the above concentrations may be chosen with the approval of the graduate advisor.

All students in the Ph.D. program are eligible to be awarded an M.S. degree upon completion of all course requirements of Phase I and II of the Ph.D. program plus either the Phase II paper requirement or the Phase II written examination.

Phase III. Dissertation: This phase is devoted almost exclusively to the dissertation. When the student has passed the formal qualifying examination and advanced to candidacy, a doctoral committee is appointed to supervise the dissertation and approve it on behalf of the Graduate Council.

Teaching Requirement: All ICS doctoral students are required to participate in teaching activities before being advanced to candidacy. Teaching activities in summer or night school, service at other universities, etc., may be accepted as fulfillment of the requirement.

Programming Competence Requirement: A computer scientist must be able to read and write programs in assembly, algebraic, and nonnumerical languages.

Lower-Division Courses

Note: Students who entered UCI prior to fall 1987 who need ICS 2 and 2L to complete their degree requirements should take ICS 51; students who need to complete ICS 3 should take ICS 23.

1A Programming and Problem Solving I (4) F, W, S, Summer. Concepts and properties of procedures; language and notation for describing procedures; application of a specific procedure-oriented language to solve simple numerical and nonnumerical problems using a computer. Principles for using computers effectively and for clearly

conceiving and expressing procedures. Designed to give the student an overview of computer science. (ICS 1A and Engineering 10 may not both be taken for credit.)

10 Computers and Society (4) Introduction to the current state of information and computer science and technology for the nontechnical student. An overview for the person who wants to understand computers and automation as a major element in our technological society. Terminology and concepts; information structures; hardware and software; programming languages; applications in business, science, and education; implications. May not be taken for credit by ICS majors.

21 Introduction to Computer Science I (6) F, W. First of a three-quarter introductory course. Introduces basic concepts, fundamental laws and principles of software and hardware organization, program construction, applications, and policy and social issues. Develops initial programming skills. Introduces useful computer-based tools for analysis, expression, and discovery. (V)

22 Introduction to Computer Science II (6) W, S. Second of a three-quarter introductory course. Builds on ICS 21: in-depth concepts of programming and software systems organization. Other topics include program analysis and correctness, advanced data structures, system design techniques, and alternative programming modes. Prerequisite: ICS 21. (V)

23 Introduction to Computer Science III (6) F, S. Third of a three-quarter introductory course. Focuses on algorithms of fundamental importance in computer science and their mathematical analysis, basic data structures for primary and secondary memory, storage allocation and management techniques, data description, and design techniques. Prerequisites: ICS 22 and Mathematics 6A. (V)

41 Introduction to Methods for Applications Programming (4). Introduction to software design, implementation, and testing techniques appropriate to applications programming. Development of a design which is implemented in different languages. Strengths and weaknesses of several languages. Prerequisite: ICS 21 or equivalent. Formerly ICS 90.

51 System Architectures (6) F, W. Operation of hardware components, ways of interconnecting them to form systems, means of modeling and analyzing their behavior, and structures that may be realized in either hardware or software. Laboratory work illustrates these concepts in the context of assembly language programming. Prerequisites: ICS 23 and Mathematics 6B.

52 Systematic Software Construction (6) W, S. Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing, estimation, and performance improvement. Laboratory work involves a project illustrating these elements. Prerequisite: ICS 51.

80 Special Topics in Information and Computer Science (2-4) F, W, S. May be repeated for credit.

92 Engineering and Computer Science Educational Laboratory (ECSEL) (2-4) F, W, S. Comprehensive academic support designed primarily for underrepresented or underprepared majors in Engineering, ICS, or selected areas of the physical sciences. Typical program activities: tutoring, study skills, career planning, self-esteem enhancement, library research techniques, graduate study planning, and independent studies. Workload credit only. Pass/Not Pass only. Same as Engineering E92.

Upper-Division Courses

121 Introduction to Software Engineering (4) W, S. Broad introduction to the concepts, techniques, and current practice of software engineering. Software process models as an organizing concept; principles relevant to each part or aspect of the different models; exercises to illustrate important tools and concepts. Prerequisites: ICS 52, Mathematics 2A-B-C, Mathematics 6A-B-C.

125B Project in System Design (4) F, W, S. Specification, design, construction, testing, and documentation of a complete software system using concepts learned in ICS 52, 121, and 141. Special emphasis on the need for and use of teamwork, careful planning, and other techniques for working with large systems. Prerequisites: ICS 121 and 141. Formerly ICS 195.

131 Social Analysis of Computerization (4) F, W, S. Introduction to computerization as a social process. Examines the social opportunities and problems raised by new information technologies, the ways individuals and groups mobilize support for their preferences, and the consequences of different choices. Computerization and the quality of work life, personal privacy, organizational productivity, unemployment, and the manageability and accountability of large systems. Prerequisites: For majors: ICS 52, Mathematics 6A-B-C, Mathematics 2A-B-C; for nonmajors: ICS 1A or equivalent. Both groups must have completed the lower-division writing requirement. Formerly ICS 193.

132 Organizational Information Systems (4) W. Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation. Prerequisite: ICS 131. Formerly ICS 181.

135 Project in the Social and Organizational Impacts of Computing (4) S. Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in ICS 131, 132, and other ICS courses. Prerequisite: ICS 132. Prior course work in research methodology or statistics is recommended.

141 Programming Languages (4) F, S. In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of languages for list, string, and array manipulation; languages for structured programming and systems programming; command and query language design; programming style; run-time representations, environments, and execution strategies. Prerequisites: ICS 52, Mathematics 2A-B-C, and Mathematics 6A-B-C.

142 Compilers and Interpreters (4) W. Introduction to theory of programming language processors. Study of compilers focusing on lexical analysis, syntax analysis, and compile-time mechanics including code generation and optimization. Study of interpreters focusing on execution of interpretive representations (such as postfix), on mechanics of interpretation, and on run-time management of data structures. Prerequisite: ICS 141.

143 Principles of Operating Systems (4) F, S. Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems. Prerequisite: ICS 141. Formerly ICS 152.

145A Language Processor Construction (4) F, S. Project course which provides working laboratory experience with construction and behavior of compilers and interpreters. Students build actual language processors and perform experiments which reveal their behaviors. Prerequisite: ICS 142. Formerly ICS 145.

145B Project in Operating System Organization (4) S. Detailed specification and design of an actual operating system. Hardware/software tradeoffs. Emphasis on logical organization of system and communication of the design to implementors through appropriate representations. Prerequisite: ICS 143. Formerly ICS 156.

147 System Measurement and Evaluation (4). Framework and methodology for determining the performance of existing and proposed information processing systems. Evaluation from the viewpoints of users, designers, and customers. Prerequisites: ICS 143 and Mathematics 131A or equivalent. Formerly ICS 191.

151 Introduction to Computer Systems Architecture (4) F, W. Boolean algebra. Design/analysis of combinational and sequential systems using SSI/MSI/LSI modules. Number systems. Error detecting and correction codes. Arithmetic algorithms. Hardware/firmware implementation of algorithms. Prerequisites: ICS 52, Mathematics 2A-B-C, and Mathematics 6A-B-C. ICS 151 and EE 131 may not both be taken for credit. Formerly ICS 151A.

152 Intermediate Computer Systems Architecture (4) S. Hardware description languages. Issues in machine organization including: arithmetic/logic unit design, control unit design. Memory organization, I/O processing and interrupts. Microprocessor system design. Prerequisite: ICS 151. ICS 152 and EE 132 may not both be taken for credit. Formerly ICS 151B.

155A Logic Design Laboratory (4) W. Introduction to standard integrated circuits: gates, flip-flops, shift registers, counters, latches. Construction and debugging techniques. Design of digital systems using LSI and MSI components. Practical use of circuits in a laboratory environment, including implementation of small digital systems such as arithmetic modules, displays, and timers. Prerequisite: ICS 151. Formerly ICS 154.

155B Microprogramming Laboratory (4). Underlying primitives of computer instruction sets. Principles of microprogramming. Microprograms written for one or more systems. Typical microprogramming applications discussed and implemented or simulated. Prerequisite: ICS 151. Formerly ICS 155.

161 Design and Analysis of Algorithms (4) F, W. Discussion of time and space complexity of algorithms. Models of computation, techniques for efficient algorithm design, effect of data structure choice on efficiency of an algorithm. Fast algorithms for problems such as sorting, set manipulation, graph problems, matrix multiplication, Fourier transforms, and pattern matching. NP-complete problems. Prerequisites: ICS 52, Mathematics 2A-B-C, and Mathematics 6A-B-C.

162 Formal Languages and Automata (4) W. Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability: Turing machines, random access machines, undecidable problems, NP-completeness. Prerequisite: ICS 161.

165 Project in Algorithms and Data Structures (4) S. Design, implementation, execution, and analysis of algorithms for sorting, graph problems, and matrix manipulations. Time-space-structure trade-offs. Prerequisite: ICS 161.

171 Introduction to Artificial Intelligence (4) F, S. Different means of representing knowledge and uses of representations in heuristic problem solving. Representations considered include predicate logic, semantic nets, procedural representations, natural language grammars, and search trees. Prerequisites: ICS 52, Mathematics 2A-B-C, Mathematics 6A-B-C.

172 Programming Techniques in Artificial Intelligence (4) W. The study of the language LISP and its derivatives, as used in problem-solving systems requiring simple recursion, procedural embedding of information, production-system control structures, pattern-directed function invocation, and a variety of access and control mechanisms. Prerequisite: ICS 171.

175 Project in Artificial Intelligence (4) S. Construction of a working artificial intelligence system. Evaluation of capabilities of the system including impact of knowledge representation. Prerequisite: ICS 172.

177 Introduction to Expert Systems (4) W. Introduction to the methodology of design and implementation of expert systems. Laboratory work will use expert system shells to construct knowledge-based systems. Emphasis on techniques for representing and organizing domain and control knowledge as opposed to the theory and implementation of inference engines. Prerequisite: ICS 171 or an introductory course in artificial intelligence.

180 Special Topics in Information and Computer Science (4) F, W, S. May be repeated for credit if title or topic varies. Prerequisites vary.

184 File and Database Management (4). Database system architecture—data structures, storage structures, and data languages. Alternate approaches to database management systems relational approach, hierarchical approach, network approach. Database security and integrity. Query processing. Prerequisite: ICS 52.

186 Computer Graphics (4). Interactive graphics software and hardware. Survey of interactive graphic design systems spanning a large family of disciplines. Each class member will generate an operational program demonstrating interactive graphics as a man-computer communication media. Prerequisite: ICS 52.

196 Tutoring in ICS (2-4) F, W, S. Offers opportunities to tutor both on an individual, as needed basis and as part of regularly scheduled courses. Specific tutoring assignments depend on the courses with which the student is working, as determined by the instructor in charge. In most cases includes time in individual tutoring and a term paper or project. Course can be taken only twice for credit. Pass/Not Pass only.

197 Honors Seminar (2) F. An overview of computer science and selected recent trends in research. Students attend talks on current faculty research, with opportunities for discussion. Prerequisites: upper-division standing; participation in ICS Honors program.

198 Honors Research (4) F, W, S. Directed independent research in computer science. Required of participants in the ICS Honors Program. May be used to substitute for one of the project courses required for the ICS degree. Prerequisites: upper-division standing and completion of the lower-division writing requirement; participation in the ICS Honors program.

199 Individual Study (2-5) F, W, S

Graduate Courses

211 Data Structures (4). An in-depth treatment of a variety of data structures and their associated management algorithms. Queues; stacks; arrays and their address mapping functions; list structures including garbage collection, compacting, copying and equality; trees, subtrees, free and binary trees, balanced trees, AVL trees, and the use of trees in sorting and searching; multilinked structures including storage allocation strategies; tables, hash codes, comparison of search methods; strings, encrypting, compression and minimal length encodings; files, records, file structures; and theories and formalisms for data description. Prerequisite: ICS 23 or equivalent.

213 Formal Semantics of Programming Languages (4). A survey of current approaches to the formal specification of the semantics of programming languages, including an introduction to and description of the merits of program verification. Areas covered will include operational, axiomatic, and denotational semantics and a comparison of these methods.

221 Computer Systems Architecture (4). Machine description languages including ISP, PMS, and graph models. Study of architectural issues and their relation to operating system functions: design of processor units, memory hierarchies and their management, microprogramming, and I/O. Prerequisites: ICS 143 and 152 (or equivalent).

222 Advanced Topics in Computer Architecture and Operating Systems (4). Machine organization and operating systems of advanced computer systems are studied. Emphasizes models of computation and computer architectures suitable to highly parallel processing. Systems studied include database machines, computer architectures for artificial intelligence, object-based systems (e.g., INTEL iAPEX 432), and reduced instruction set architectures (RISK). Future trends in computer systems architecture are discussed.

223 Computer Networks (4). Introduction to computer network—protocol architectures to performance. Discussion of various techniques to provide reliable communication among processes in distributed environments. Topics covered include layering protocol architectures, functions of each layer, packet switched networks, local networks, interprocess communication, internetworking. Examples from networks including ARPA network and X.25 public data networks. Prerequisite: consent of instructor.

224 Introduction to Computer Design (4). The methodology and use of CAD tools for computer design, accomplished by a lab in which students practice design using commercially available silicon compilers and other tools. Prerequisite: ICS 151 or equivalent.

233 Analysis of Algorithms (4). Analysis of correctness and complexity of various efficient algorithms; discussion of problems for which no efficient solutions are known. Set manipulation, graph algorithms, matrix multiplication, fast Fourier transform, pattern matching, and NP-complete problems. Prerequisite: ICS 161 or equivalent.

234 Advanced Analysis of Algorithms (4). Analysis and design techniques for algorithms, particularly emphasizing randomness and parallelism. Coin-flipping algorithms, analysis of algorithms with assumptions about input distribution, simultaneous resource bounds and the class NC, parallel algorithms, P-complete problems, linear programming, lower bounds. Prerequisite: ICS 233 or equivalent.

242 Knowledge Representation in Artificial Intelligence (4). Investigation of approaches to representation of knowledge for machine intelligence. Need for such knowledge as exhibited by examples of human behavior. Evaluation of current models and representations.

245A Software Engineering (4). Study of concepts, methods, and tools for the analysis, design, construction, and measurement of complex, software-intensive systems. Underlying principles emphasized. State-of-the-art software engineering and promising research areas covered, including principles of software engineering, requirements analysis, design, implementation, and project management.

245B Software Engineering (4). Study of concepts, methods, and tools for analysis, design, construction, and measurement of complex, software-intensive systems. Underlying principles emphasized. State-of-the-art and promising research areas covered, including software reliability, environments, and technology evaluation. Prerequisite: ICS 245A.

246 Computing Resource Management (4). Approaches to providing computing services in the context of large organizations. Determination of goals, selection of equipment, management of programming staff, coping with change, marketing services, keeping up with technology, pricing and other techniques for allocation of services, financing, vertical versus horizontal organizations.

Graduate-level seminars and workshops are not offered each year but are offered as student and faculty interests dictate.

250 Seminar in Programming Languages, Translators, and Systems (4)

251 Seminar in Artificial Intelligence (4)

252 Automata Theory (4). Advanced course in theory of finite automata and their relationship to formal languages and grammars. Formal analysis of various computational models including Finite State Acceptors, Push Down Acceptors, Turing Machines, and Random Access Machines. Topics include undecidability, computation complexity, and NP-completeness. Prerequisite: ICS 161 or equivalent.

258 Seminar in the Social and Economic Implication of Computers and Automation (4). Consists primarily of readings of a number of statements about computing's impact on individuals and organizations. Analyses of those statements and positions using techniques developed by UCI researchers.

260 Seminar in Natural Language Processing (4). A cognitive approach to the representations and processes underlying natural language understanding and generation. Representation topics include Conceptual Dependency theory, knowledge structures, scripts, plans, goals, MOPs. Process topics include conceptual analysis and its relation to parsing of formal (nonnatural) languages; inference generation and constraint; memory organization and retrieval; acquisition of knowledge; acquisition of language.

262 Seminar in Models of the Brain (4). Models of aspects of human and animal behavior, and theories of how those behaviors may arise from brain operation. How infant learning is affected and how both the learning and the operation of simple predictive and discriminatory behavior can be explained in terms of models that are compatible with relevant data from neurophysiology.

270 Workshop in Programming Languages, Translators, and Systems (4)

271 Introduction to Artificial Intelligence (4). Introduction to Artificial Intelligence (AI), the study of mental faculties through the use of computational models. Fundamental subdisciplines of AI including knowledge representation, search, deduction, planning, natural language parsing and comprehension, knowledge-based (expert) systems, and learning.

275 Machine Learning (4). Computational approaches to learning. Covers methods for concept formation, learning search heuristics, language acquisition, and machine discovery, among others. Participants should be familiar with heuristic search techniques and fluent in the LISP programming language. Prerequisite: ICS 271.

280 Special Topics in Information and Computer Science (4) F, W, S

290 Research Seminar (2). Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research. Satisfactory/Unsatisfactory only.

291 Directed Research (4)

295 Colloquia-Orientation (2) F. Graduate orientation program and colloquium series. Required of all Phase I Ph.D. students. Satisfactory/Unsatisfactory only.

298 Thesis Supervision (2 to 12). Individual research or investigation conducted in preparation for the dissertation requirements for the Ph.D.

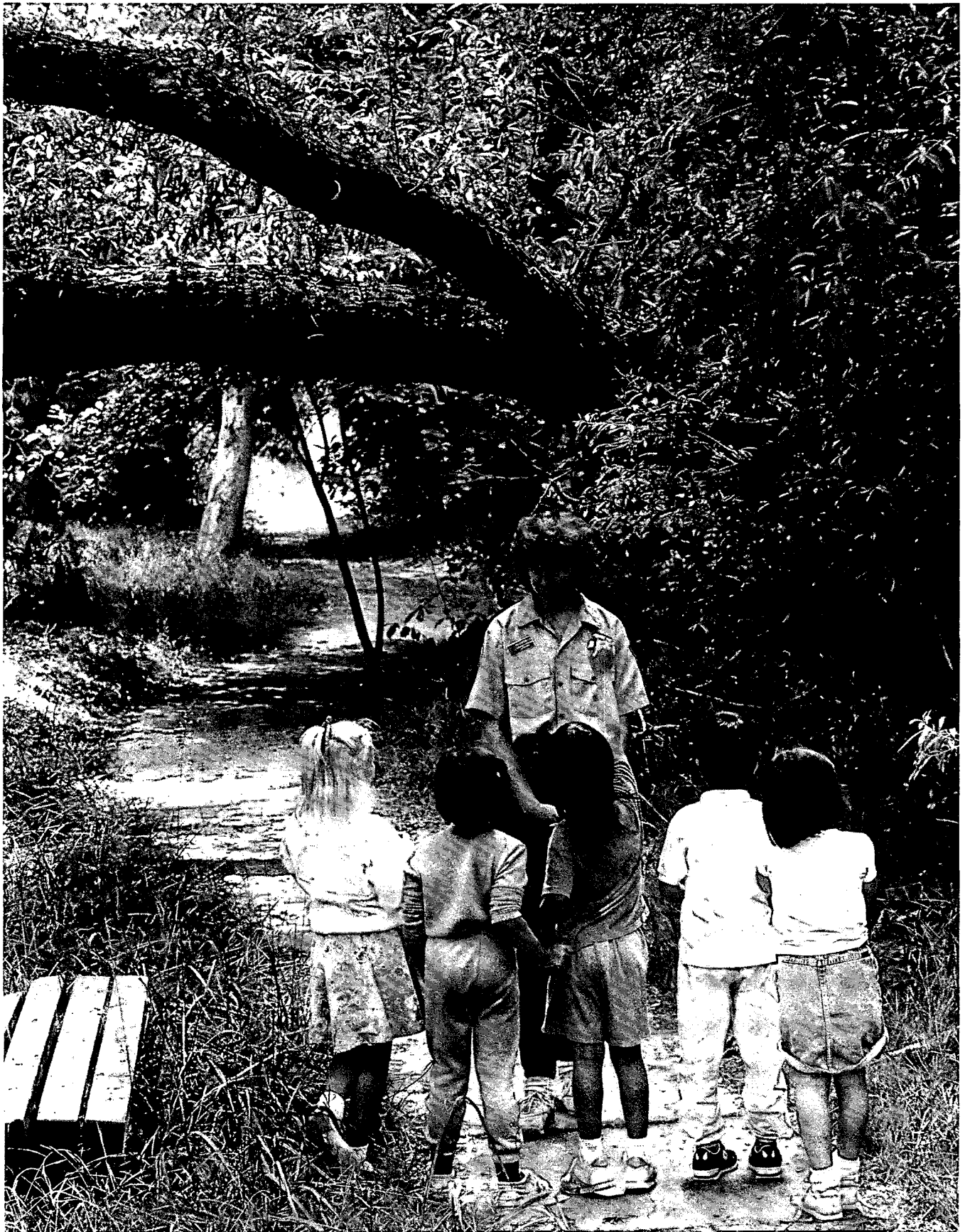
299 Individual Study (2 to 12). Individual research or investigation under the direction of an individual faculty member.

399 University Teaching (4). Involves on-the-job experience for Teaching Assistants. Limited to and required of Teaching Assistants.

Program in Social Ecology

Daniel Stokols **Director**

- Daniel G. Aldrich, Jr., Ph.D. University of Wisconsin, *Chancellor Emeritus, Professor of Soils and Plant Nutrition, Developmental and Cell Biology, Ecology and Evolutionary Biology, and Social Ecology, Emeritus*
- Hoda Anton-Culver, Ph.D. St. Andrews University (Scotland), *Vice Chair and Professor of Community and Environmental Medicine and of Social Ecology*
- Hana Ayala, Ph.D. J.E. Purkyne University (Czechoslovakia), *Assistant Professor of Social Ecology* (landscape ecology, resort landscape conceptual design, environmental management for international tourism)
- Mark Baldassare, Ph.D. University of California, Berkeley, *Professor of Social Ecology and Social Sciences* (urban sociology, public opinion research, social impact assessment)
- Arnold Binder, Ph.D. Stanford University, *Professor of Social Ecology and Psychiatry and Human Behavior* (research methodology, juvenile delinquency, police organization and methods)
- Arthur S. Boughey, Ph.D. Edinburgh University, *Professor Emeritus of Social Ecology*
- Kitty C. Calavita, Ph.D. University of Delaware, *Assistant Professor of Social Ecology* (sociology of law, criminology, social deviance, immigration, and inequality)
- Kenneth S. Chew, Ph.D. University of California, Berkeley, *Assistant Professor of Social Ecology* (social demography, urban sociology, family and life course studies)
- K. Alison Clarke-Stewart, Ph.D. Yale University, *Professor of Social Ecology* (development in early childhood and the effects of variation in the social environment)
- Ross F. Conner, Ph.D. Northwestern University, *Associate Professor of Social Ecology* (evaluation research and social psychology, health promotion)
- Thomas J. Crawford, Ph.D. Harvard University, *Associate Professor of Social Ecology and Psychiatry and Human Behavior* (attitude theory and social problems research)
- T. Timothy Crocker, M.D. University of California, San Francisco, *Professor, Department of Community and Environmental Medicine, and Professor of Social Ecology* (clinical and experimental environmental medicine)
- Joseph F. DiMento, Ph.D., J.D. University of Michigan, *Professor of Social Ecology and Management* (planning, land use and environmental law, use of social science in policy making, legal control of corporate behavior)
- John D. Dombrink, Ph.D. University of California, Berkeley, *Associate Professor of Social Ecology* (crime and criminal justice, deviance and social control)
- C. David Dooley, Ph.D. University of California, Los Angeles, *Associate Director of Undergraduate Studies, Program in Social Ecology, and Professor of Social Ecology* (community psychology, epidemiology, economic change)
- Kenneth W. Dumars, M.D. University of Colorado, *Professor of Pediatrics, Physical Medicine and Rehabilitation, and Social Ecology* (etiology of chromosome nondisjunction, genetic counseling, longitudinal cytogenetic study of myeloproliferative disorders)
- Jonathon E. Ericson, Ph.D. University of California, Los Angeles, *Associate Professor of Social Ecology and of Anthropology* (archaeological chemistry, environmental quality and health, earth sciences)
- Gary W. Evans, Ph.D. University of Massachusetts, *Professor of Social Ecology* (human stress, environmental cognition, and research methodology)
- Robert H. Friis, Ph.D. Columbia University, *Associate Clinical Professor, Primary Care, and Social Ecology* (psychology and sociology of health and illness)
- Gilbert L. Geis, Ph.D. University of Wisconsin, *Professor Emeritus of Social Ecology* (crime and criminal justice)
- Wendy A. Goldberg, Ph.D. University of Michigan, *Assistant Professor of Social Ecology* (developmental psychology, children and their families, transition to parenthood, social policy)
- Louis A. Gottschalk, M.D. Washington University Medical School, *Professor of Psychiatry and Human Behavior, Social Ecology, and Social Sciences* (psychiatric consultation with medical and surgical patients, psychosomatic medicine, psychopharmacology, development of measurement methods of assessing psychological states and traits, psychoanalysis)
- Ellen Greenberger, Ph.D. Harvard University, *Professor of Social Ecology* (developmental psychology, adolescence and social institutions, work and the family, social policy)
- Paul D. Jesilow, Ph.D. University of California, Irvine, *Assistant Professor of Social Ecology* (crime and criminal justice)
- Michael Kleinman, Ph.D. New York University, *Associate Professor of Community Health and Environmental Medicine and of Social Ecology* (air pollution health effects)
- Salvatore R. Maddi, Ph.D. Harvard University, *Professor of Social Ecology* (personality, psychopathology, health psychology, creativity)
- Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Social Ecology* (environmental studies and design, organizational analysis, management and planning, and social and behavioral aspects of architecture)
- Richard McCleary, Ph.D. Northwestern University, *Professor of Social Ecology* (criminal justice, research methodology, statistics)
- James W. Meeker, Ph.D., J.D. State University of New York, Buffalo, *Associate Professor of Social Ecology* (sociology of law, criminal justice, research methodology, statistics)
- Raymond W. Novaco, Ph.D. Indiana University, *Associate Professor of Social Ecology* (human stress, aggression, community psychology)
- Betty H. Olson, Ph.D. University of California, Berkeley, *Professor of Social Ecology, Civil Engineering, and Environmental Toxicology* (aquatic microbiology, environmental health and molecular biology, water resources)
- Henry N. Pontell, Ph.D. State University of New York, Stony Brook, *Associate Dean of Research and Graduate Studies and Associate Professor of Social Ecology and Social Sciences* (criminal justice, sociology of law, medical sociology)
- Karen S. Rook, Ph.D. University of California, Los Angeles, *Associate Director of Graduate Studies, Program in Social Ecology, and Associate Professor of Social Ecology and Physical Medicine and Rehabilitation* (gerontology, social support systems, subjective well-being and health)
- Benson Schaffer, J.D. Southwestern University School of Law, *Lecturer in Social Ecology* (criminal justice and family law)
- Deane H. Shapiro, Jr., Ph.D. Stanford University, *Associate Professor of Psychiatry and Human Behavior, and Social Ecology in Residence* (stress management, self control, and behavioral medicine)
- Daniel Stokols, Ph.D. University of North Carolina, *Director of the Program in Social Ecology and Professor of Social Ecology* (health impacts of environmental stressors, environmental design and social behavior)
- Luis Suarez-Villa, Ph.D. Cornell University, *Associate Professor of Social Ecology* (planning and public policy, regional science, international and regional development)
- William C. Thompson, Ph.D. Stanford University, J.D. University of California, Berkeley, *Assistant Professor of Social Ecology* (psychology and law, criminal justice, human judgment and decision making, use of social science in appellate litigation)
- Kathleen J. Tierney, Ph.D. Ohio State University, *Assistant Professor of Social Ecology* (collective behavior and social movements, sociology of mental illness, disasters and hazards)
- Elaine Vaughan, Ph.D. Stanford University, *Assistant Professor of Social Ecology* (environmental assessment, risk perceptions, research methodology, social psychology)
- Carol K. Whalen, Ph.D. University of California, Los Angeles, *Professor of Social Ecology and Psychiatry and Human Behavior* (developmental psychopathology, childhood behavior disorders, child therapies, health psychology)
- John M. Whiteley, Ed.D. Harvard University, *Professor of Social Ecology* (moral development, late adolescent to early adult development, social ecology of peace)



An important aspect of the undergraduate program in Social Ecology is its field study requirement for majors. Field study settings include a wide range of institutions and agencies in both the private and public sector, such as the Irvine Nature Center.

The Program in Social Ecology applies interdisciplinary scientific methods to the study of a wide range of recurring social and environmental problems. Among the issues of longstanding interest to the Program are violence in society, social influences on normal and atypical human development over the life span, and aspects of the physical environment that have an impact on human health and behavior.

The faculty of Social Ecology is *multidisciplinary*. It includes psychologists who have specialized in developmental, environmental, clinical, and social psychology; urban sociologists; criminologists; planners; environmental health scientists; and lawyers. While faculty members are firmly grounded in these parent disciplines and teach basic courses in them, they concentrate their efforts on teaching and research with a problem orientation. In these problem-oriented courses, they integrate concepts and perspectives of several disciplines. This focus arises from commitment to the view that the analysis of complex societal problems requires *interdisciplinary* efforts (i.e., the joining of talents by people with different intellectual backgrounds). A number of social ecologists are involved in interventions directed toward improving the way groups of individuals, institutions, and communities function; a number of others are involved in interventions aimed at improving the quality and control of the environment.

Research Facilities

The Social Ecology Building features several facilities for experimental research, including wet laboratories for research and teaching in the environmental health sciences; behavioral assessment laboratories for research in human development, social relations, and legal studies; and an environmental simulation laboratory for studying the effects of environmental conditions. The wet laboratories are used for studying air and water pollution. The behavioral assessment laboratories are used for study of parent-child interaction, cooperation among children, hyperactivity, and mock jury discussions. The environmental simulation laboratory permits full-scale, realistic simulations of interior environments such as offices, classrooms, and apartments. Within these settings, physical conditions (e.g., ambient lighting and color patterns, music and noise, spatial arrangements and physical density) and social processes (e.g., group communication patterns) can be varied experimentally so that researchers can assess the separate and joint effects of these conditions and processes upon occupants' performance and well-being.

Degrees

Social Ecology B.A., M.A., Ph.D.
Applied Ecology (offered jointly
with the School of Biological Sciences) B.A.

Honors

Honors at graduation will be awarded to about 12 percent of the graduating seniors. Initial eligibility for such honors will be on the basis of grade point average. A general criterion is that students must have completed at least 72 units in residence at a University of California campus. Final decisions concerning the awards of *summa cum laude*, *magna cum laude*, and *cum laude* are the responsibility of a committee chaired by the Associate Director for Undergraduate Studies.

Honors Program in Social Ecology

The Social Ecology Honors Program provides the opportunity for selected students majoring in Social Ecology to pursue advanced independent study. Admission to the program is based on formal application normally submitted in the spring quarter of the junior year. In order to be considered, a student must have satisfied the following requirements: comple-

tion of all lower-division Social Ecology courses required for the major; completion of at least five upper-division Social Ecology courses with a grade point average of at least 3.5 in these courses; and achievement of an overall grade point average at UCI of at least 3.2. Invitation to the program is based upon evidence of the student's ability, interest in research, and proposed thesis project. Successful completion of the program requires two quarters of supervised, independent work on a thesis research project (Social Ecology H190A-B) and written and oral presentation of an honors thesis (Social Ecology H190C).

Career Opportunities

Graduates of the Program in Social Ecology bring a distinctive cross-disciplinary perspective to the job market. The Program provides a solid foundation for those students who seek jobs in planning departments, mental health settings, educational institutions, and a variety of community and governmental agencies. Many Social Ecology students find that their interdisciplinary training is also useful for careers in management and personnel.

The Program also provides sound preparation for students who wish to apply to graduate and professional schools of law, administration, public health, social welfare, psychology, sociology, criminology, and urban planning.

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71.

Undergraduate Program in Social Ecology

The Social Ecology major offers either a general interdisciplinary degree in Social Ecology or a more focused experience through one of three specializations: Environmental Health and Planning; Criminology, Criminal Justice, and Legal Studies; and Psychology and Social Behavior. The specialization designation is noted on the student's transcript upon graduation.

A minor in Social Ecology is offered for students who wish to be exposed to an interdisciplinary, scientific orientation toward environmental, social, and criminal justice problems while pursuing another major. The Social Ecology faculty believes that an exposure to the components of the Program's curriculum is valuable to the educated individual. Program components include an integrative theoretical framework, an understanding of the research world, and familiarity with the use of scientific information in problem solving and policy making.

Field Study

An important aspect of the undergraduate program is its field study requirement for majors. Field study is open *only* to upper-division Social Ecology majors. Field study is designed to provide students with an opportunity to examine social-environmental problems as they occur in community settings; to evaluate the merit of ideas presented in the classroom; and to conduct naturalistic observations and investigations at field sites. Under the supervision of a Social Ecology faculty sponsor, students are encouraged to evaluate procedures and problem-solving strategies used in the work place and to observe the links between community practices and academic ideas and issues.

The settings provided for field study include a wide range of problem-oriented institutions and agencies in both the private and the public sector (e.g., Orange County Public Defender's Office, UCI Medical Center, California Department of Transportation, American Red Cross, primary and secondary schools, Fairview Development Center, Irvine Temporary Housing). Other field study placements may be generated by faculty and students to fit their particular interests. All field studies are taken on a Pass/Not Pass basis and require Departmental approval. Further information on field study, including information about sign-up procedures and prerequisites, must be obtained from the Social Ecology Counseling Office.

Environmental Health and Planning

The Environmental Health and Planning specialization is concerned with the interactions between the physical environment and human health and behavior. Students begin with basic courses in human ecology, environmental quality, environmental psychology, urban sociology, and planning and public policy. Subsequent course work moves toward problem-oriented courses in these areas, enriched by ongoing faculty and student research on such topics as the effects of environmental stressors (e.g., crowding, smog, noise); environmental pollution; the biology and politics of water pollution; potential impacts of natural disasters; compliance with environmental regulations; the way in which economic changes in a community affect the health and well-being of its residents; the effects of stress on health; causes and consequences of urbanization and population change; and risk assessment.

In addition to providing basic knowledge for students in other areas, courses are relevant to professional careers in the areas of administration, environmental quality and health, environmental impact assessment, and community environmental education. Graduate and professional opportunities related to environmental analysis include urban and regional planning, architecture, environmental psychology, ecology, public health, and urban sociology. Special emphasis is placed upon the roles of individual citizens and community organizations, both governmental and private, in maintaining and enhancing the quality of the human environment. Field study is done in city planning departments, private architectural firms, environmental information centers, pollution control agencies, and health agencies.

Specialization in Environmental Health and Planning

Following the completion of Social Ecology E8 (Introduction to Environmental Analysis), students must complete six courses from the following list:

- E101 Environmental and Public Health Policy
- E107 Urban and Regional Planning
- E108 Spatial Structure of Metropolitan Areas
- S110 Human Stress
- E111 Survey Analysis of Urban Residents
- E112A-B Design and Behavior I, II
- E119 Urban and Regional Analysis
- E120 Topics in Applied Ecology
- E125 Microbial Ecology of Natural and Polluted Waters
- E125L Microbial Ecology of Natural and Polluted Waters Laboratory
- E126 Environmental Designs for International Tourism
- E127 International Environmental Management
- E130 Urban Issues, Policy, and Theory
- E132 Urban Sociology
- E136 Social Ecology of the Borderlands
- E139 Urbanization and Social Change
- E140 The Chemical Components of Water Quality

- E143 Elements of Environmental Design
- E149 Life in Space
- E153 Chronological Dating Techniques in Environmental Reconstruction
- E155 Environmental Chemistry
- E157 Strategies of Health Promotion
- E158 Community Health: An Epidemiological Approach
- E159 Environment and Health
- S159 The Family
- E161 Chemistry for Environmental Engineering
- E162 Environmental Law
- E165 Health and the Social Environment
- E167A History of Water Pollution: Biological
- E167B History of Water Pollution: Chemical
- E169A-B Applied Ecology Seminar
- E171 Dynamics of Human Populations
- E173 Human Ecology
- E175 Environmental Reconstruction
- E175L Laboratory for Environmental Science
- E187 Environmental Psychology
- E188 Advanced Environmental Psychology: Facilities Design for the Workplace
- E189 Environmental Design Research Methods

The following lower-division course is recommended:

- E5 Introduction to Environmental Quality and Health

Psychology and Social Behavior

The Psychology and Social Behavior specialization is concerned with human behavior in social contexts. A major objective is to study variations in social environments (e.g., the family, school, workplace) that affect human behavior over the life cycle. Students begin with basic course work in human development, social psychology, community psychology, and abnormal psychology. Subsequent course work examines a variety of topics pertinent to the fields of community, abnormal, developmental, environmental, clinical, and health psychology, and the psychological study of social problems. Sample courses cover psychosocial development in children, adolescents, and adults; gerontology; sex differences; attitude change; the evaluation of social programs; psychology and the law; the effects of stress on psychological adjustment; counseling and psychotherapy. Opportunities also are available to work with faculty on research in these and other areas.

Students are given a foundation that will enable them to work after graduation from UCI in the private or public sectors or to do graduate work in psychology, human development, social work, counseling, or education. Approximately 50 agencies are available for field study in this specialization, including schools, child care facilities, community clinics, counseling centers, hospital settings, and social service agencies.

Specialization in Psychology and Social Behavior

Following the completion of S9 (Introduction to Human Behavior), students must complete six upper-division courses from among the following. Listed courses are arranged in course groupings that represent the major areas of psychology within the Program in Social Ecology: Developmental Psychology, Environmental Psychology, Social Psychology, Clinical Psychology, Health Psychology, and Psychology and Social Problems.

Developmental Psychology

S113 Infant Development
 S122 Human Sexuality
 S123 Adolescent Development
 S125 Special Topics in Adult Development
 S127 Child Development
 S132 Gerontology
 S145 Perspectives on Child Rearing
 S148 Development of Sex Differences
 S149 Moral Development Over the Life Span
 Strongly recommended: S11 Human Development Over the Life Cycle

Environmental Psychology

E112A-B Design and Behavior
 E187 Environmental Psychology
 E188 Advanced Environmental Psychology: Facilities Design for the Workplace
 E189 Environmental Design Research Methods

Social Psychology

E111 Survey Analysis of Urban Residents
 S117 Social Relationships
 S118 Interviewing and Assessment
 J133 Deviance
 S136 Intimate Relationships
 S138 Attitude Organization and Change
 S143 Attitudes and Behavior
 S159 The Family
 166D Introduction to Survey Analysis
 S181 Leadership
 S188 Social Psychology
 Strongly recommended: S86 Introduction to Social Psychology

Clinical Psychology

S101A-B Counseling Theory
 S104 Behavioral Assessment
 S105 Developmental Disabilities
 S106 Clinical Child Psychology
 S107 Child Therapies
 S109 Cognitive Behavior Therapy
 S111 Abnormal Behavior
 S116 Peer Counseling
 S151 Developmental Psychopathology
 S156 Introduction to Clinical Psychology
 E165 Health and the Social Environment
 S166 Behavior Modification
 S170 Personality

Health Psychology

S110 Human Stress
 S150 Child Health Psychology
 E158 Community Health: An Epidemiological Approach
 S160 Advanced Seminar: Human Stress
 S186 Sports Psychology

Psychology and Social Problems

S108 Social Ecology of Child Abuse and Neglect
 S120 Violence in Society
 J132 Juvenile Delinquency
 J133 Deviance
 S154 Work and the Family
 S161 Family Law
 S165 Sociology of Mental Health and Illness
 S171 Social Conflict
 S178 Social Ecology of Peace I
 S184 Community Psychology
 S185 Impacts of Divorce
 J190 Psychology and the Law

Strongly recommended courses for students who anticipate pursuing graduate study in psychology:

Biological Sciences 79, 80, 81 (Biological Bases of Behavior)
 Social Ecology 13 (Statistical Analysis in Social Ecology) or 166A-B-C (Social Science Statistics I, II, III)
 Social Sciences 151A (Experimental Psychology), Social Sciences 153B (Learning Theory), and Social Sciences 153F (Human Memory)

Criminology, Criminal Justice, and Legal Studies

The Criminology, Criminal Justice, and Legal Studies specialization is concerned with the social control of criminality and violence and with the relationship between society and its legal institutions. Basic courses cover forms of criminal behavior and introduce the student to the workings of the American legal system. Subsequent course work focuses on topics in police behavior, personality, environment, and crime, and the behavior of legal institutions including courts. Students in the specialization study deterrence of criminal behavior, white collar and corporate crime of several kinds, and legal decision making. Also provided is an introduction to substantive areas of law (criminal, environmental, family, and others), to regulatory agencies, and to interactions among organizations with the legal system.

This specialization provides students with opportunities to examine critical issues in regard to criminal and delinquent behavior and official reactions toward violators. The course of study prepares students for careers in justice system administration, probation and parole, law enforcement, and formal corrections, as well as for law school and other graduate programs including criminology, criminal justice, legal studies, and sociology. Offerings examine social problems that involve crime and society's reactions to these problems, and assess the organization and operation of the criminal justice system as it now functions. Field study placements are available in police departments, public defenders' offices, probation and parole agencies, consumer affairs agencies, the State juvenile detention system, the Victim/Witness Assistance Program, the Orange County Legal Services Program, the UCI College Legal Clinic, and in private legal firms.

Specialization in Criminology, Criminal Justice, and Legal Studies

Following the completion of J4 (Introduction to Criminal Justice), students must complete six of the following courses:

J101 Civil Legal System
 S108 The Social Ecology of Child Abuse and Neglect
 J114 Organized Crime and American Society
 J115 Federal Law Enforcement
 S120 Violence in Society
 J132 Juvenile Delinquency
 J133 Deviance
 J134 Victimless Crimes
 J138 Victims of Crime
 J140 Prisons, Punishment, and Corrections
 J141 Seminar in Criminal Justice
 J142 White Collar Crime
 J143 Theories of Punishment
 J144 Criminal Law
 J145 Government Crime
 J146 Social Control of Violence
 J147 Law and Social Change
 J148 Criminological Theory

J150 The Legal Profession
 S161 Family Law
 E162 Environmental Law
 J164 Social Control of Delinquency
 J181 Contemporary Legal Issues
 J182 Legal Sanctions and Social Control
 J190 Psychology and the Law

The following courses are especially recommended to students who desire exposure to legal reasoning and analysis in order to help decide whether to pursue a career in law, and to students who wish to learn how to "think like a lawyer": J80, J101, J144, J147, S161, E162, J181, J190. These courses are taught by members of the Social Ecology faculty who are lawyers.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

Social Ecology Major Requirements

Lower-Division Requirements

Social Ecology 1 (Principles of Social Ecology), 10 (Research Design); 13 (Statistical Analysis in Social Ecology); J4 (Introduction to Criminal Justice); E8 (Introduction to Environmental Analysis); and S9 (Introduction to Human Behavior).

Upper Division Requirements

Ten upper-division Social Ecology courses (numbered 100-193), 194 (Studies in Field Settings); two quarters (eight units) of 195 (Field Study) taken during junior and senior years. Students must complete required prerequisite courses prior to field study enrollments; open only to Social Ecology majors.

In order to remain in good standing and be eligible for graduation from the Program in Social Ecology, a student must maintain a minimum grade point average of 2.0 in all required lower-division Social Ecology courses (1, 10, 13, J4, E8, S9) and also in the 10 required Social Ecology upper-division courses (100-193) plus 194.

Planning a Program of Study

Students who major in Social Ecology, although they may be specializing in a single area of interest, are encouraged to develop an appreciation of a wide array of person-environment problems. The strongest program of study also includes basic course work in at least one of the social, biological, or physical sciences. Students who enter the major as freshmen should plan to complete the required lower-division courses by the end of the junior year. Transfer students and students who declare a major in Social Ecology after entering UCI should work with the Social Ecology Counseling Office to develop a plan for meeting the requirements of the major in an orderly fashion.

The Social Ecology Counseling Office is prepared to help all students in planning a program of study. Contact with this Office is important so that students will develop a broad, yet coherent, series of courses. Students who expect to pursue graduate study should consult also with appropriate faculty members to ensure proper preparation.

Undergraduate Major in Applied Ecology

The Program in Social Ecology and the School of Biological Sciences offer a program of undergraduate instruction leading to a B.A. degree in Applied Ecology. The interdisciplinary curriculum furnishes a strong undergraduate foundation for students interested in advanced study in environmental planning and resource management.

An Applied Ecology major receives the basic science training of a Biological Sciences major and utilizes these skills in a core of environmentally based courses taught in Social Ecology. Social Ecology brings to this major a unique combination of courses in Environmental Quality and Health, Planning and Public Policy, and Law and Society. This combination, together with a strong biology background contributed by the School of Biological Sciences and a general science background contributed by the School of Physical Sciences, enables students selecting this major to pursue interdisciplinary learning experiences which are difficult to achieve within traditional disciplines. The first three years of the major are very structured, leaving the last year open for students to specialize in an area of their choice.

Careers in Applied Ecology

Careers in the fields of environmental and resource management and planning are particularly suited to an Applied Ecology background. Many graduates hold technical or administrative positions in, for example, the United States Environmental Protection Agency; or in California's Regional Water Quality Control Board, Air Resources Board, Department of Fish and Game, and Department of Health and Human Services; or in various county and city agencies. A variety of firms in the private sector employ Applied Ecology graduates to prepare environmental impact reports, laboratory analyses, and planning studies. Industrial health professionals are in demand to help determine the safety of workplace environments for the labor force. The Applied Ecology major also provides a strong academic foundation for graduate or professional study in areas such as conservation and natural resources, environmental health science, microbiology, public health, law, planning, and administration.

The Applied Ecology major provides students with a comprehensive treatment of basic ecological principles and their relevance to human needs. As an alternate pathway, students with an engineering perspective are encouraged to explore the program options in Environmental Engineering offered by the School of Engineering. Also, students are encouraged to explore the concentration in Ecology and Environmental Biology, leading to a B.S. degree in Biological Sciences, offered by the School of Biological Sciences.

Requirements for the Bachelor's Degree in Applied Ecology

University Requirements: See pages 52-55; the Applied Ecology degree combines breadth and major requirements.

Applied Ecology Requirements

The University breadth requirements are incorporated within the Applied Ecology curriculum; no additional coursework is required to complete the breadth (general education) requirements. All of the Applied Ecology requirements must be taken for a grade (except field study). Students must maintain a minimum grade point average of 2.0 in Applied Ecology lower- and upper-division courses, as well as a grade point average of 2.0 in all courses taken at UCI.

Each student must fulfill the following general, field study, and elective requirements:

General: Mathematics 2A, 2B, and either Mathematics 2C or 7; For those intending to do field study: Social Ecology 10. Humanities 1A, 1B, 1C (lectures and discussions), plus any course approved to meet the upper-division writing requirement.

Physics 3A-B, 3LA-LB, or Physics 5A-B, 5LB.

Chemistry 1A-B-C, 1LB-LC, 51A, 51LA, and 51B, 51LB.

Social Sciences 4.

Biological Sciences 90; 101; 102; 103 and 103L or 104 and 104L; 106; 106L; and 166.

Social Ecology 1; E5, E8; and E120 or E173.

Field Study: Social Ecology 194 and one quarter of 195; or two quarters of Independent Study (199) sponsored by a faculty member in one of the focused areas below.

Elective: No fewer than three, and preferably, six courses in one of the following focused areas. Students should note that some courses below have prerequisites.

Resource Management-Aquatic Environments:

Biological Sciences 120, 169, 175, 179, 180, 181; Social Ecology E125, E140, E153, E155, E167A, E167B, E169A-B.

Resource Management-Terrestrial Environments:

Biological Sciences 120, 167, 173, 174, 184, 186, 187, 189; Social Ecology E153, E155, E169A-B, E175, E175L.

Water Pollution:

Biological Sciences 122, 127, 175, 180; Social Ecology E121, E125, E125L, E140, E158, E167A, E167B, E169A-B.

Industrial Hygiene and Occupational Health:

Biological Sciences 173, 206E; Engineering ME164, ME264; Social Ecology E121, E140, E155, E158, E167A, E167B.

Environmental Health Sciences:

Biological Sciences 173, 206E; Social Ecology E121, E155, E158, E169A-B.

Environmental Law and Planning:

Social Ecology E113, E119, E120, E162, E167A, E167B, E169A-B, E173.

Planning a Program of Study

It is important that students take the required science courses early, in order that the science background may be utilized in the Social Ecology courses. There are many required courses, and the student must plan carefully. For initial academic advising, students should consult the Social Ecology Counseling Office (163 Social Ecology Building) or the Biological Sciences Student Affairs Office. Faculty academic advisors may be either Social Ecology or Biological Sciences faculty members.

Undergraduate Minor in Social Ecology

Social Ecology Minor Requirements

Lower-Division Requirements

J4 Introduction to Criminal Justice

E8 Introduction to Environmental Analysis

S9 Introduction to Human Behavior

Upper-Division Requirements

Students must complete five upper-division courses selected from Social Ecology courses numbered 100-193 all within one specialization (Environmental Health and Planning; Criminology, Criminal Justice, and Legal Studies; Psychology and Social Behavior).

Additional Curricular Options

Social Ecology majors may combine their course work with the following University programs and should consult an academic counselor for further information.

Education

Students who plan to obtain a teaching credential or a higher degree in the field of education should consult with counselors in the Office of Teacher Education early in their college career. Students completing a B.A. in Social Ecology may qualify for a waiver of the Single Subject Credential Examination. Social Ecology courses that are relevant to a career in education include: S9, S11, S101A-B, S104, S106, S107, S114, S122, S127, S134, S161, S166, E5, E6, E158, E187, J80, J101, J132. For additional information about teaching credentials, refer to the Teacher Education section.

The 3-2 Program with the Graduate School of Management

Outstanding Social Ecology majors who are interested in a career in management may wish to apply for entry into the Graduate School of Management's 3-2 Program. Students normally apply for this program early in their junior year. See the Graduate School of Management section for additional information.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with more than 85 host universities and colleges in 33 countries throughout the world. Detailed information is available on pages 61-62.

Minor in Global Peace and Conflict Studies

Participating Faculty

Dennis Aigner, Graduate School of Management

Francesca Cancian, School of Social Sciences

Gordon Chang, School of Humanities

Joseph DiMento, Program in Social Ecology

Lawrence Howard, School of Social Sciences

Karl Hufbauer, School of Humanities

Jon Jacobson, School of Humanities

Gregory Kavka, School of Humanities

Jon Lawrence, School of Physical Sciences

Herbert Lehnert, School of Humanities

Guy de Mallac, School of Humanities

Julius Margolis, School of Social Sciences

Calvin McLaughlin, School of Biological Sciences

Seymour Menton, School of Humanities

Keith Nelson, School of Humanities

Riley Newman, School of Physical Sciences

Frederick Reines, School of Physical Sciences

Shawn Rosenberg, School of Social Sciences

Sherwood Rowland, School of Physical Sciences

Rowland Schinzinger, School of Engineering

Caesar Sereseres, School of Social Sciences

Rein Taagepera, School of Social Sciences

John Whiteley, Program in Social Ecology

The Minor in Global Peace and Conflict Studies is an interdisciplinary curriculum designed to introduce the student to

the phenomenon of international violence in the twentieth century, with particular attention to the danger of nuclear war and the challenge of creating a satisfactory and enduring peace. The minor is available through the School of Humanities, the Program in Social Ecology, and the School of Social Sciences. The minor and its courses, however, are open to all UCI students.

Participants in the minor must complete the equivalent of nine courses, beginning in the sophomore year with an introductory series and culminating later with the Peace and Conflict Forum and its related seminar, usually taken during the senior year. The student selects the remainder of the courses comprising the minor from an approved list of upper-division courses and must organize these choices in consultation with a panel of the participating faculty into a coherent interdisciplinary program complementary to the student's major.

Requirements for the Minor:

Three lower-division courses: History 11 (Introduction to Peace and Conflict), Social Science 26D (The Nuclear Arms Race), Physics 16 (Physics of Nuclear Weapons).

Five relevant upper-division courses. Among those usually offered are: History 146B (American Foreign Relations Since World War II), Social Sciences 123G (U.S. Foreign Policy), Social Sciences 123D (U.S. National Security), Social Sciences 113E (Political Economy of National Defense), Social Sciences 122A-B (Soviet Society and Politics), History 133A-B-C (European International History), History 195 (Arms Control Simulation), Philosophy 182 (Issues in Social Philosophy), Social Ecology S178, S179, S180 (Social Ecology of Peace I, II, III), Social Sciences 161Z (War, Peace, and Gender).

With approval of the Global Peace and Conflict Studies faculty, relevant lower-division courses may be substituted for up to two of the five required upper-division courses.

A minimum of two quarters of Humanities 180 (same as Social Sciences 123S or Social Ecology E184)—Peace and Conflict Forum—total of two units maximum for credit.

One quarter of Humanities 181 (same as Social Sciences 123T or Social Ecology E185)—Peace and Conflict Seminar—totaling two units, taken during winter quarter of the senior year.

Further information concerning the minor is available in the Global Peace and Conflict Studies office, 734 Social Science Tower; telephone (714) 856-6410.

Graduate Program in Social Ecology

The graduate program in Social Ecology is organized around the study of contemporary problems in the social and physical environment. Emphasis is placed primarily upon theory and research that have implications for policy and intervention. Problems are researched from the complementary perspectives of a multidisciplinary faculty that includes specialists in community, environmental, social, developmental, and health psychology; planning and architecture; urban sociology; law; criminology; and environmental health. Graduate education emphasizes this multidisciplinary orientation rather than the focused perspective of a single discipline. Ph.D. degree students may elect to pursue a general course of graduate study in the principles and methods of social ecology, or they may elect to pursue the Ph.D. in Social Ecology with a specialized course of study in one of four concentrations: *Environmental Analysis and Design*; *Criminology, Law, and Society*; *Health Psychology*; and *Human Development*. A program of study leading to the M.A. degree also is offered.

The Social Ecology faculty apply diverse methods of scientific inquiry to social and environmental problems. Evaluation research, legal research, questionnaire and survey methods, field research, naturalistic observation, and quasi-experimental techniques receive equal emphasis with laboratory experimentation. Collaborative research with faculty members is an important component of graduate education in the Program.

A sampling of faculty research and teaching interests includes human stress, psychosocial aspects of physical and emotional health, program evaluation, economic change and behavioral disorders, atypical child development, use of deadly force by police, legal sanctions and deterrence, white-collar and organized crime, physical environment's effects upon social behavior and health, childbearing decisions, personality and psychopathology, effects of social environments on early child development, urban decentralization, community studies, social support systems among the elderly, water quality, air quality, the use of scientific information in public policy formation, the performance and health impacts of work environments, and environmental regulatory processes.

Admission

The Program offers graduate education leading to the Master of Arts and Doctor of Philosophy degrees in Social Ecology. Individuals desiring a Ph.D. degree should apply directly to the Ph.D. program. Only individuals interested in the M.A. degree as their final degree in Social Ecology should apply for admission at the Master's level. Applicants for the Ph.D. program should apply either for the general course of graduate study in social ecological principles and methods or for a specialized course of study in one of the four concentrations. All applicants should submit undergraduate transcripts, three letters of recommendation, Graduate Record Examination General Test scores, and a formal application before February 1. Additional information is available from the Social Ecology Graduate Counselor; telephone (714) 856-5917.

M.A. Program

The Master's program offers advanced training that prepares students for a variety of positions. Many recent M.A. graduates are now employed in federal, state, county, city, and private agencies in such areas as planning, mental health and welfare, and probation and parole. In addition, a number of students with the Master's degree in Social Ecology have entered Ph.D. programs at other universities.

Each incoming Master's degree student is assigned a faculty advisor with whom the student discusses an individual program of education. The program leading to the M.A. degree requires a thesis and satisfactory completion of seven approved courses (28 units), including the Seminar in Social Ecology (Social Ecology 200), Research Methods (Social Ecology 201), and at least one additional approved course in statistics or methodology. Other courses should be selected with regard to the student's academic and career objectives, and must be approved by the faculty advisor. The seven required courses must include at least five graduate courses and must be exclusive of any directed study, independent study, or thesis courses (Social Ecology 298, 299, or 295). One four-unit

field study (Social Ecology 297) course may be counted as one of the seven required courses. A grade of B or better must be achieved in all courses. Students are advanced to candidacy for the M.A. degree, and a thesis committee appointed, after a review of their graduate work and thesis plans by a faculty committee. All M.A. students who have not advanced to candidacy will be formally evaluated by the Social Ecology faculty at the end of each academic year. At that time the faculty may recommend that the student continue toward the M.A. or cease study in the Program. Evaluation of M.A. students who have advanced to candidacy is the responsibility of the student's Master's thesis committee. One year of academic residence is required, but completion of all M.A. requirements, including a thesis approved by the student's committee, ordinarily takes about two years.

Ph.D. Program

The doctoral program offers advanced training that prepares students for academic careers in research and teaching. Graduates also are well qualified for employment in private or governmental agencies, where they can bring advanced academic training, strong methodological and statistical skills, and special expertise to such issues as environmental health and design, urban and regional planning, criminal justice, and social policies affecting mental and physical health. Students who enter with the normal academic preparation and pursue a full-time program of study ordinarily should be able to earn the Ph.D. in four to five years of study beyond the baccalaureate.

Each incoming Ph.D. student is assigned a faculty advisor with whom the student should meet at least once every quarter to discuss an individualized program of graduate education. The following core courses are required of *all* Ph.D. students: Seminar in Social Ecology (Social Ecology 200), Research Methods (Social Ecology 201), two approved quarters of graduate-level statistics, and either Program Evaluation (Social Ecology 291), Social Epidemiology (Social Ecology 224), or Strategies of Theory Development (Social Ecology 261).

In addition to these five required core courses, doctoral students who are pursuing a general course of study must also complete a minimum of six other approved graduate-level courses before advancement to candidacy. These six additional required courses are exclusive of any field study, directed study, independent study, or dissertation research courses (Social Ecology 297, 298, 299, or 296). Students may take each of their electives within a different substantive area or may take clusters of courses within fewer subareas.

The requirements differ somewhat for students who choose to pursue a more specialized course of study in one of the four concentrations. The requirements for the concentrations are summarized in subsequent sections.

Program faculty believe that Ph.D. students should become involved in research very early in their graduate careers. To encourage such involvement, doctoral students are required to complete a research project before advancement to candidacy for the Ph.D. degree. The method of research may include experiments, questionnaire and interview studies, systematic field observation, secondary analysis, computer simulations, and other methods. It is expected that students will begin their project during the first year in residence and will complete it during the second year. The written report of the project may be equivalent to a Master's thesis and may be submitted as such if the student's committee approves.

Also, before being officially advanced to candidacy for the Ph.D. degree, doctoral students must demonstrate mastery of

one or more research areas within Social Ecology. Accordingly, students are required to submit a written analysis of a social-environmental problem relevant to one or more disciplines within Social Ecology. The breadth requirement can be completed through alternative written formats including a comprehensive examination or the submission of a major paper or series of papers that intensively examines specific research issues. Preferably, the perspective taken should be interdisciplinary, but a single disciplinary approach is acceptable if it is more congruent with the student's educational goals and is acceptable to the student's committee. Each student's plans for completing the breadth requirement are developed in collaboration with a committee of three Social Ecology faculty members. Students are encouraged to assemble and meet with this committee as early as possible during their graduate career and are required to do so by no later than the third quarter of their second year. Once the student's plans have been approved and implemented, the examining committee will meet with the individual to determine if the breadth requirement was successfully completed, and to recommend additional academic work if it is deemed necessary.

A student may be formally advanced to candidacy for the Ph.D. degree when all requirements except the dissertation have been completed, and when the student's dissertation plan has been approved by the candidacy committee appointed by the Dean of Graduate Studies on behalf of the Graduate Council. The student will appear before this committee for an oral examination. The dissertation plan will include a thorough examination of the history of the problem being proposed for investigation, its current status, the way in which the proposed research will further knowledge, a detailed specification of the proposed method of approach to the problem, and a description of the planned methods for analyzing the data collected. It is strongly recommended that students advance to candidacy during their third year of study. In no case will students be allowed to advance to candidacy after the end of their fifth year of study.

Formal advancement to candidacy for the Ph.D. degree will be made by the Dean of Graduate Studies upon recommendation by a unanimous vote of the student's candidacy committee. Alternatively, the committee may recommend a course of action to strengthen the student for advancement to candidacy at a future date. When the student is advanced to candidacy, a doctoral committee will be appointed on behalf of the Graduate Council. The doctoral committee, ordinarily consisting of three members of the faculty, will supervise the preparation and completion of the doctoral dissertation. The dissertation should be completed and accepted within one to two years, and no later than three calendar years after the student's advancement to candidacy.

All Ph.D. students who have not been advanced to candidacy will be formally evaluated by the Social Ecology faculty at the end of each year. At that time, the faculty may recommend that the student continue toward the Ph.D. degree, complete the M.A. degree only, or cease graduate studies in the Program. Evaluation of Ph.D. students advanced to candidacy is the responsibility of the student's doctoral dissertation committee. Prior to the award of the Ph.D. degree, each doctoral student must serve as a Teaching Assistant under faculty supervision for at least two quarters.

Graduate Concentration in Environmental Analysis and Design

The doctoral concentration in Environmental Analysis and Design prepares students to conduct research on questions of vital importance to environmental and planning professionals. These questions deal with health, behavioral, and environmental design factors, as well as the urban and regional planning options considered by public and private-sector policymakers. The curriculum and the diversity of faculty within the concentration allow for unique opportunities for multidisciplinary research and training. One of the concentration's strengths is its research methods sequence, which draws from several disciplines and includes survey and epidemiologic methods, water and air quality testing, facilities programming and postoccupancy evaluation, legal research, psychological testing relating to environmental change, and socioeconomic analyses of urban and regional phenomena. Potential employment sources for graduates include academic and research institutions; federal agencies; policy-making organizations; urban and regional planning agencies; national, community, and workplace health-promotion programs; and environmental design consulting firms.

Each incoming student takes the five core courses required of all Ph.D. students, noted above, and eight elective courses drawn from the three focal areas within this concentration: Environmental Design and Behavior, Urban Planning and Design, and Environmental Health and Public Policy. The elective courses cover topics such as environmental and urban design, environmental health risk, urban planning, facilities design and management, behavioral epidemiology, demography, the regulatory process, urban and regional analysis, technological hazards and change, and environmental toxicology. The normative time for completion of the Ph.D. requirements is four to five years. Students are expected to become involved in research activities as early as their first year of graduate study. Two years of course work are followed by a predissertation research project, the fulfillment of the breadth requirement, and the preparation of a dissertation proposal. The fourth and possibly fifth years are devoted to the development and completion of the dissertation research.

Graduate Concentration in Criminology, Law, and Society

The study of the criminal, crime, and institutional responses to illegal behavior is the focus of the doctoral concentration in Criminology, Law, and Society. Students examine issues related to the etiology of crime, the impacts of crime on society, and organizational responses to crime. The concentration also includes an emphasis on social regulation and the civil justice system which combine in a unique program that allows the investigator to address the nature of illegal activities as well as the response of individual and social systems to those activities.

Students gain familiarity with a number of subjects including sentencing; crime rates; selective incapacitation; modes of modifying criminal behavior; offender dangerousness predictability; motives of police behavior; punishment; alternatives to incarceration; victimology; white-collar and organized crime; behavior of courts, juries, and regulatory agencies; and interactions among organizations within the legal system. Students may concentrate on particular substantive areas of law and society including occupational health and safety, white-collar or economic crime, environmental law, and business-government interactions. In general, students are introduced to the leading classical and contemporary issues in criminology, law, and society and to ways of understanding them through interdisciplinary research. The concentration aims to develop theoretical sophistication and to prepare the

graduate student for research, teaching, and administrative work in institutions in the legal system, the criminal justice system, and related organizations.

In addition to the five core courses and other requirements for the Ph.D. degree, students take at least six other graduate courses in areas such as theories of crime, law and society, and legal institutions and social policy. Students become involved in research activities from the earliest stages of their training and conduct independent, supervised research projects during the second year of graduate study. Methods of research may include experiments, questionnaire and survey studies, systematic field observation, computer simulation, and legal research. Students complete a breadth requirement during year three. One option for doing so is by means of a critical and conceptually integrative literature review on a specific topic in criminology or law and society, although other options—including a comprehensive examination—are available. The fourth and fifth years of study are devoted to developing and defending a dissertation proposal and completing dissertation research. Opportunities for field placements in legal and criminal justice settings are also available.

Graduate Concentration in Health Psychology

The doctoral concentration in Health Psychology focuses on identifying, evaluating, and enhancing the psychosocial and behavioral factors that promote health, prevent disease, and optimize medical treatments. The concentration involves a strong commitment to multidisciplinary scholarship and a focus on knowledge and theory, research competencies, and health professional skills. Students are encouraged to join active investigative teams studying processes such as adaptive aging; stress, coping, and social support; the development of heart-healthy behavior patterns during childhood and adolescence; worksite health promotion and the design of work environments; and environmental risk assessment. Potential employment sites for graduates include academic institutions; health care settings; federal agencies; school, workplace, and community health-promotion programs; research organizations; and university and government policy institutes.

Students concentrating in Health Psychology fulfill the basic requirements for a Ph.D. degree including the required core courses. In addition, students take four health psychology courses, Seminar in Health Psychology (Social Ecology 258), Biobehavioral Aspects of Health and Illness (Social Ecology 273), Human Stress and the Environment as Stressor (Social Ecology 267), and the three-quarter Practicum in Health Psychology (Social Ecology 209A-B-C); one health psychology elective, Child Health Psychology (Social Ecology 277), Perceptions of Environmental and Health Risks (Social Ecology 275), Interpersonal Processes and Health (Social Ecology 262), or Psychosocial Dimensions of Chronic Illness (Social Ecology 231); and three additional courses, Social Gerontology (Social Ecology 225), Seminar in Environmental Psychology (Social Ecology 288), Violence in Society (Social Ecology 237), Research on Subjective Well-Being (Social Ecology 248), only one of which can be taken from the Health Psychology cluster.

Students are expected to become involved in research activities from the earliest stages of their training and to conduct an independent, supervised research project during their second year. Students take a two-part qualifying examination during their third year, involving a written comprehensive examination (in fulfillment of the breadth requirement) and a critical and conceptually integrative literature review on a specific health psychology topic. The fourth and possibly fifth years are devoted to developing and defending a dissertation proposal and completing dissertation research. Opportunities for field placements in health-related settings also are available.

Graduate Concentration in Human Development

The doctoral concentration in Human Development joins three important intellectual traditions. Students are trained in key developmental theories and concepts, with attention to all phases of the life span; in the research methods of several social-scientific specialities; and in the conduct of problem-oriented research that addresses issues of current concern to individuals and to society as a whole. Potential employment sites for graduates include academic institutions (e.g., departments of psychology or human development); human services settings (e.g., hospitals, schools, community agencies); research organizations; government policy institutes; and a variety of private sector employers.

Students are encouraged to become actively involved in research from the earliest stages of their training. Current research teams are investigating the effects of divorce and custody arrangements; the effects of maternal and paternal employment on parents' well-being and child and adolescent outcomes; the effects of stressful life circumstances over the life span; the cues children use in judging each other and the ecologies in which problem behaviors tend to manifest themselves; the strengths and limitations of children as witnesses; and the impact of activity patterns and social ties on the well-being of the elderly.

Students fulfill the basic requirements for the Ph.D. degree including the required core courses. In addition, students take two human development courses, Principles of Human Development (Social Ecology 220) and Issues in Human Development (Social Ecology 236A-B); two courses from the life span cluster of the curriculum, e.g., Adolescence (Social Ecology 204), Social Gerontology (Social Ecology 225); and four additional courses, distributed as best suits the student's plan of study. Students select these courses from clusters that focus on the foundations of development; different parts of the life span; methods and strategies of research; social, physical, and cross-cultural contexts of development; health and adjustment over the life span; and social problems and social policies. In addition to courses offered by the Program in Social Ecology, the Human Development curriculum may include courses offered by the Graduate School of Management, the Department of Psychobiology in the School of Biological Sciences, and the Departments of Anthropology and Sociology in the School of Social Sciences.

In addition to course work, students conduct an independent, supervised research project during their second year. They take a two-part qualifying examination during their third year, consisting of a written comprehensive examination (in fulfillment of the breadth requirement), and prepare a critical and conceptually integrative literature review on a topic of importance to the field of human development. This topic often is related to the student's future dissertation research. The fourth and possibly fifth years are devoted to developing and defending a dissertation proposal and completing dissertation research.

Undergraduate Courses

Principles and Methods

1 Principles of Social Ecology (4) F, S. Lecture, three hours. Introduction to the ecological paradigm through a consideration of the classic and recent works in human, cultural, and social ecology. Emphasis on the use of the ecological paradigm as an aid in analyzing societal problems and prescribing for their amelioration. (III)

10 Research Design (4) F, S. Lecture, three hours. An introduction to the logic behind and methods of designing research studies and experiments in Social Ecology. Statistical reasoning discussed to the extent necessary for relevant data analyses. (III)

13 Statistical Analysis in Social Ecology (4) W. Lecture, three hours. Introduction to the techniques of statistical analysis in Social Ecology. Topics include probability, statistical inference, significance testing, univariate descriptive statistics, and multivariate analysis from an interdisciplinary perspective. Prerequisite: Social Ecology 10; may be taken concurrently. Restricted to majors only.

H20A-B-C Critical Issues in the Social Sciences (6-6-6) F, W, S. Lecture, three hours; seminar, two hours. Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly small seminars emphasizing the development of the skills of critical thinking and quantitative analysis through regular written work are integral to the course. Prerequisite: restricted to members of the Campuswide Honors Program. Same as Social Sciences H1E-F-G. (III)

100 Special Topics in Social Ecology (4). Lecture, three hours (or variable). Special topics courses are offered from time to time, but not on a regular basis. Course content varies with interests of the instructor. Prerequisites: Social Ecology 1 and, in some cases, consent of instructor. May be repeated for credit.

113 Social Interventions (4). Lecture, three hours. Interdisciplinary course involving analyses of several social change issues common to Social Ecology subareas. Focus is on assessment for and design of social interventions in settings ranging from the small group through the community. Especially recommended to students concurrently taking field study.

166A-B-C Social Science Statistics I, II, III (4-4-4) F, W, S. Lecture, four hours; laboratory, three hours. **166A-B:** Descriptive statistical concepts and techniques most widely used in social science research. Weekly labs employ computer graphics to investigate concepts.

166C: Classical statistical inference, limited to simple random sampling or simple randomization designs. Characteristics of sampling distributions; bias, standard error, mathematical models, estimation, hypothesis testing. Same as Social Sciences 100A-B-C. (V)

166D Introduction to Survey Analysis (4). Seminar, three hours; laboratory, two hours. Student research teams analyze survey-generated data using the techniques from Social Ecology 166A-B-C. Students present their results at a symposium for that purpose. Corequisite: enrollment in Social Ecology 166C. Same as Social Sciences 100D.

166E Introduction to Statistical Computing (4). Lecture, two hours; laboratory, two hours. Enables the student to utilize the analysis routines available within the Statistical Package for the Social Sciences (SPSS). Methods of data management and interpretation of computer output are covered. Students also are introduced to FORTRAN programming. Prerequisites: Social Ecology 166A and concurrent enrollment in 166B, or consent of instructor. Same as Social Sciences 100E.

H190A-B Honors Research (4-4) F, W. Seminar, three hours. Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project. **H190A:** Pass/Not Pass only. **H190B:** Letter grade only. Prerequisites: acceptance into the Honors Program; junior or senior standing.

H190W Honors Seminar and Thesis (4) S. Seminar, three hours. Students write up their honors research project (H190A-B) and prepare an oral report which is presented at the honors seminar. Prerequisites: acceptance into the Honors Program; junior or senior standing.

194 Studies in Field Settings (4) F, S. Lecture, three hours. Introduction to alternative models of experiential learning and to various methods of observation, assessment, and evaluation. Introduction to the nature of organizations and ethical issues that emerge from research and intervention in natural settings. Must be taken prior to Social Ecology 195. Enrollment in discussion section is required. Prerequisites: Social Ecology 1 and 10; restricted to Social Ecology majors. Letter grade only.

195 Field Study (2-4) F, W, S. Prerequisites: Social Ecology 194; junior standing; restricted to Social Ecology majors. May be repeated for credit. Pass/Not Pass only.

198 Directed Studies (2-4) F, W, S. Prerequisite: consent of instructor. Pass/Not Pass only.

199 Special Studies (2-4) F, W, S. Prerequisites: consent of instructor and junior or senior status.

Environmental Health and Planning

E3 Human Environments (4) W. Lecture, three hours. Introduction to concepts of demography, utilization of resources, growth and carrying capacity. Course focuses on the biological and physical aspects of current human problems. The course employs an ecological perspective to investigate solutions. (II)

E4 Natural Disasters (4). Lecture, three hours. This course will examine the natural processes and impacts of natural disasters. The responses of our society are examined and compared with available prehistoric case studies. Basic understanding of natural processes is gained in this course. (II)

E5 Introduction to Environmental Quality and Health (4) S. Lecture, three hours. A preliminary survey of people's interaction with the physical and biological environments. Components included are water, air, food, noise, and housing. Included are elements of environmental administration, environmental education, and consumer protection. International aspects of these factors examined. (II)

E6 Introduction to Ecology (4) S. Lecture, three hours. Principles of ecology: application to populations, communities, ecosystems, and humans. Same as Biological Sciences 1C. (II)

E8 Introduction to Environmental Analysis (4) W, S. Lecture, three hours. An overview of the analytic techniques and theoretical principles shared by public health, urban planning, and environmental design. Convergence and divergence among these disciplines for research and practice are discussed. (III)

E100 Special Topics in Environmental Analysis (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of the instructor. Prerequisites: Social Ecology E8 and, in some cases, consent of instructor.

E101 Environmental and Public Health Policy (4) F. Lecture, three hours. Examines factors involved in shaping public health and environmental policy. Topics include the role of science in public health policy, the function of governmental regulatory agencies, citizen participation, and economic and sociopolitical aspects of controlling infectious diseases and regulating carcinogens.

E107 Urban and Regional Planning (4) W. Lecture, three hours. Introduction to the process of urban and regional change and its relationship to planning in America. Seminal works concerning urban change and models of the city derived from these works are related to the policymaking functions of planning in our society. History of planning, aspects of the planning process, and roles in the planning profession are considered. Prerequisite: Social Ecology E8 or permission of instructor.

E111 Survey Analysis of Urban Residents (4) F, S. Lecture, three hours. Hypotheses concerning the nature and problems of metropolitan areas are tested using Orange County data. A resident survey and the 1980 census are used to study urban social and economic issues. Empirical research projects will be assigned during the course. Prerequisites: Social Ecology 1, 10, and either Social Ecology 166A-B-C or Social Sciences 100A-B-C.

E112A-B Design and Behavior (4-4). Lecture, three hours. **E112A:** Tools of architectural analysis and programming. Teaches social scientists basic graphic communication tools. Prerequisite: E187.

E112B: Techniques of design evaluation from the perspectives of social science and architecture. Interior and exterior design projects considered. Prerequisite: Social Ecology 10 and E112A.

E119 Urban and Regional Analysis (4) F. Lecture, three hours. An introduction to concepts and methods in regional science with applications to planning, public policy, and environmental analysis. Spatial interaction, location, multiplier, basic activity, and input-output models and their relation to ongoing urban and regional phenomena will be considered. Prerequisites: either Social Ecology 10, 166A-B-C, or Social Sciences 100A-B-C.

E120 Topics in Applied Ecology (4). Lecture, three hours. A survey of how ecological concepts are used in dealing with selected environmental management problems, such as pollutant cycling, agricultural practices, water quality, pest management, and the promotion of desirable species. Legal, social, and economic implications of the topics will also be considered. Prerequisite: Social Ecology E5 or course in ecology.

E125 Microbial Ecology of Natural and Polluted Waters (4). Lecture, three hours. Examines microorganisms and their functions in the aquatic environment, specifically microorganisms' role in the biogeochemical cycles of nitrogen, sulfur, and mercury, and how man's activities are affecting these cycles. In addition, considers how and why indicator organisms are used in the determination of water quality for public health. Prerequisite: Social Ecology E5 or a course in biology. Same as Biological Sciences 118.

E125L Microbial Ecology of Natural and Polluted Waters Laboratory (4). Laboratory, three hours. Covers experiments that deal with the enumeration and identification of microorganisms from various aquatic environments. Microbial mediation of the sulfur, nitrogen, and mercury cycles is examined in the laboratory. Public health aspects of water quality are also examined. Prerequisite or corequisite: Social Ecology E125. Same as Biological Sciences 118L.

E126 Environmental Design for International Tourism (4) W. Lecture, three hours. Architectural, landscape, interior, and urban designs triggered by international tourism. Latest advances in the master-planning of tourism complexes; their integration into regional developments. Ecology, identity, and heritage of human environments as a new challenge for tourism design. Prerequisite: upper-division standing.

E127 International Environmental Management (4) S. Lecture, three hours. Introduction to the network of intergovernmental organizations (the United Nations, in particular) and international nongovernmental organizations in the field of environmental management. Analysis of key international projects and sources of information. Lessons for the integration of international research expertise.

E130 Urban Issues, Policy, and Theory (4). Lecture, three hours. A critical survey of current U.S. urban, metropolitan, and regional issues and trends, and their relation to spatial theories, and to planning and public policy-making. Topics include Sunbelt/Frostbelt growth and decline, urban employment and unemployment, central city redevelopment, and housing and the urban environment. Prerequisite: Social Ecology 10.

E132 Urban Sociology (4) W. Lecture, three hours. Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems.

E136 Social Ecology of the Borderlands (4) W. Lecture, three hours. An introduction to the most important socio-economic issues affecting the urban-regional context of the U.S.-Mexico border area. Borderlands regional development, urbanization, migration, industrialization, labor market, and environmental issues are considered.

E139 Urbanization and Social Change (4). Lecture, three hours. Examines interactions between social structure and physical space in three contexts: (1) the contemporary evolution of cities and their hinterlands in the U.S.; (2) patterns of urbanization in the Third World; and, as background for understanding these developments, (3) the re-emergence of cities in Medieval Europe.

E140 The Chemical Components of Water Quality (4) W. Lecture, three hours. A survey of the chemical properties of water used for drinking, agriculture, and industry. The lecture portion of the course covers basic chemical analyses of water and the significance of these tests in determining water quality. Prerequisites: Chemistry 1A and Social Ecology E5. Same as Biological Sciences 119.

E143 Elements of Environmental Design (4) W. Lecture, three hours. Basic elements of environmental design such as scale, proportion, rhythm, color, sound, lighting, surfaces, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability.

E149 Life in Space (4). Lecture, three hours. The need for autonomy, weightlessness, radiation, isolation, and confinement aboard the Space Station present problems of human environmental quality and health. The student attends the problems of living in space and appreciates space technology including life support, robotics, expert systems, and artificial intelligence.

E153 Chronological Dating Techniques in Environmental Reconstruction (4) F. Lecture, three hours. Radiocarbon dating is a good example of a common technique which has wide application for a number of different fields. Surveys a number of dating techniques which can be used to establish a chronological framework. Particular emphasis placed on applications for environmental reconstruction. Same as Social Sciences 132A.

E155 Environmental Chemistry (4) F. Lecture, three hours. Uses and impacts of heavy-metal toxins in the environment traced from ore bodies, product manufacture, consumption, and waste management. Routes of exposure; medical and societal impacts of these exposures. Prerequisites: junior standing and consent of instructor.

E157 Strategies of Health Promotion (4). Lecture, three hours. Examination of strategies for promoting physical and mental health at community, organizational, and individual levels. Interventions designed to promote healthier lifestyles, organizational structures, and environmental conditions are discussed. Criteria for monitoring cost-effectiveness of these programs are considered. Prerequisite: Social Ecology 1.

E158 Community Health: An Epidemiological Approach (4). Lecture, three hours. An examination of the distribution and dynamics of human health problems on the community level and exploration of the principles and procedures of scientific investigation used to determine circumstances under which diseases occur or health prevails. The broadened scope of epidemiology including environmental, genetic, nutritional, and social ramifications, in addition to the classical concern about infectious diseases and their role in social upheavals, is surveyed. Prerequisite: consent of instructor.

E159 Environment and Health (4). Lecture, three hours. Examination of relationships between sociophysical environments and physical and mental health at both individual and aggregate levels of analysis. Environmental resources and risk factors associated with resistance or vulnerability to disease are considered at each level. Prerequisites: Social Ecology 1 and E8.

E161 Chemistry for Environmental Engineering (4) F. Lecture, three hours. Basic concepts from general, physical, organic, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics applied to acid-base chemistry, mineral and gas solubility, coordina-

tion, redox reactions, and absorption. With laboratory. Prerequisites: Chemistry 1C or 61B; Engineering E101 or consent of instructor. Same as Engineering CE164.

E162 Environmental Law (4) S. Lecture, three hours. Environmental law is a combination of traditional legal principles and newly created statutes, rules, and decisions applied to the area of environmental protection. Course investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality. Federal and state laws are utilized. Same as Social Sciences 180B.

E165 Health and the Social Environment (4). Lecture, three hours. Focuses on the delineation and measurement of psychological, social, and cultural factors in the etiology of disease; analysis of variables which affect individual compliance with prescribed medical regimens; and identification of factors which affect a community's response to public health programs.

E167A History of Water Pollution: Biological (4) F. Seminar, three hours. Sources of water pollution are followed from the Middle Ages to the present. Investigation of how these problems were viewed in relationship to health and to problem solving. The design of the course is to acquaint the students with previous practices and to compare those practices with those used today. Prerequisite: Social Ecology E5 or consent of instructor.

E167B History of Water Pollution: Chemical (4). Seminar, three hours. Traces the history of chemical pollutants, including organics, heavy metals, and inorganic compounds over the nineteenth and twentieth centuries. Compounds are reviewed in terms of their impact on human health and the aquatic environment. Prerequisite: Social Ecology E5.

E169A-B Applied Ecology Seminar (3-3) F. Seminar, two hours. Introduces Applied Ecology majors to a variety of research occurring in industry and universities concerned with subjects addressed in the major. Selected topics include environmental health issues, water quality, hazardous waste management, biotechnology, and economic concerns in management of pollution problems. Prerequisite: upper-division Applied Ecology majors.

E171 Dynamics of Human Populations (4) S. Lecture, three hours. Introduction to social demography. Topics include the world population explosion, the revolution in longevity, misbeliefs about our ancestors, the American baby boom, working women in industrial societies, and Wall Street-style demographics.

E173 Human Ecology (4) W. Lecture, three hours. Examines the contradictory forecasts of a range of population-environmental models, including T.R. Malthus' *First Essay on Population* (1798), the U.S. government's *Global 2000 Report*, and Julian Simon's *Ultimate Resource*.

E175 Environmental Reconstruction (4) S. Lecture, three hours. Applications of a number of scientific techniques used in environmental science are surveyed with reference to specific case studies. Students incorporate these techniques and sampling procedures in their research designs. Prerequisites: Social Ecology E8 and SE10 or equivalent; previous or concurrent enrollment in Social Ecology E175L; consent of instructor; senior standing preferred. Same as Social Sciences (Anthropology) 132B.

E175L Laboratory for Environmental Science (4) S. Provides weekly lecture, lab experiments, and demonstration of techniques in the environmental sciences. Three to five Saturday field trips as well as a four-day field trip to study specific environmental problems. Prerequisites: previous or concurrent enrollment in Social Ecology E175; consent of instructor; senior standing preferred. Same as Social Sciences (Anthropology) 132BL.

E184 Peace and Conflict Forum (1-1). Lecture, two hours. A faculty-student forum featuring lecturers from a variety of institutions with discussion issues related to global peace and conflict. Pass/Not Pass only.

E185 Peace and Conflict Seminar (2). Seminar, two hours. Seminar in which student prepares a research paper under direction of a faculty supervisor. Prerequisite: only open to students in the Global Peace and Conflict Studies minor.

E187 Environmental Psychology (4) F. Lecture, three hours. Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; and (c) methodological approaches to the study of environmental issues. Prerequisites: Social Ecology 10 and E8.

E188 Advanced Environmental Psychology: Facilities Design for the Workplace (4). Lecture, three hours. Survey of major topics in the field of facilities design and management including methods of environmental programming and postoccupancy evaluation, design criteria for office automation, and facility-based strategies for promoting employee health, productivity, and improved quality of worklife. Review of scientific evidence for health and performance impacts of automation, lighting, color, aesthetic decor, and the ergonomic design of the work areas. Prerequisites: Social Ecology 1, E8, and E187.

E189 Environmental Design Research Methods (4). Lecture, four hours. First part of the course is an in-depth treatment of theoretical and empirical work relevant to selected topics in environmental psychology. In the second part, students go into the field in collaboration with architectural consultants and develop environmental evaluation instruments, collect data, and report findings to the architectural consultants who then provide feedback to the students on the usefulness of the data. Prerequisites: Social Ecology 10 and E187.

Criminology, Criminal Justice, and Legal Studies

J4 Introduction to Criminal Justice (4) F, W, S. Lecture, three hours. Traces our legal system from its common law heritage. An introduction to criminal and constitutional law in the United States providing basis for discussion of our court structure, corrections, probation and parole, and the police activities of arrest, search and seizure, and interrogations. Juvenile Court law and procedure discussed. (III)

J40 Forms of Criminal Behavior (4). Lecture, three hours. "Crime in the streets" and "crime in the suites" have aroused public concern. Political agitation surrounds crimes of violence; reformers demand equivalent sanctions against the white-collar criminal. (III)

J41 The Police (4). Lecture, three hours. A social-psychological study of the police. Examines the nature and structure of police organizations and discusses their relationship to the social environment.

J44 Crime and Society (4). Lecture, three hours. Examination of the sources of crime in contemporary American society and the concept of crime as one form of "deviance." Review of social policy in crime control, and discussion of the organization and structure of police forces and correctional agencies.

J45 The Police and Social Change (4). Lecture, three hours. An examination of the history and philosophy of police organization and administration with special emphasis on how society determines the role of the police and the influence of changing social conditions on the role of the police.

J80 Law and Society (4). Lecture, three hours. A survey of man's relationship with law including an analysis of the theoretical and practical role of law in the evolution of Western civilization with emphasis on modern American society. Examines current issues in the sociology and psychology of law. (III)

J100 Special Topics in Criminal Justice (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of the instructor. Prerequisites: Social Ecology J4 and, in some cases, consent of instructor.

J101 Civil Legal System (4) F. Lecture, three hours. Provides an overview of the American civil legal system and of certain fundamental legal concepts as well as an introduction to legal research. Strongly suggested for those students who intend to take Social Ecology J144, J190, S161, or E162, or who plan to attend law school. Course requirements include reading, briefing and debating judicial opinions, legal research, and writing an appellate legal brief. NOTE: Students who have taken Social Ecology 89 may not enroll in this course.

J114 Organized Crime and American Society (4) F. Lecture, three hours. Examination of the phenomenon of American organized crime from a sociological perspective and explanation of methods by which this particular form of criminality is tolerated at various levels of society. Emphasis on ways in which "underworld" interests interact with legitimate economic and political institutions.

J115 Federal Law Enforcement (4). Lecture, three hours. Examines the peculiar legal and organizational concerns of the federal system of law enforcement as well as some of the crimes it is uniquely designed to address—white-collar crime, drug trafficking, racketeering, and public corruption. The roles and responsibilities of the FBI, DEA, Customs, and other policing agencies. Prerequisites: Social Ecology J4, J101, and consent of instructor.

J132 Juvenile Delinquency (4) S. Lecture, three hours. Study of the patterns of delinquent behavior, selected theories that explain the behavior, and current research that aims at enhancing exploratory power. Attempts to prevent and control delinquency are put in a historical perspective that includes examination of the development of the current juvenile justice system and evolution of modern juvenile law.

J133 Deviance (4) S. Lecture, three hours. Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Social Sciences 161F and 155B.

J134 Victimless Crimes (4) S. Lecture, three hours. An examination of criminal offenses in which there are apt to be no complaining witnesses—homosexuality, prostitution, gambling, drug use, and abortion. Implications of the use of criminal law to control these behaviors in terms of the individuals involved in the offenses, other persons, and the society in general. Various alternative social policies reviewed and evaluated.

J138 Victims of Crime (4). Lecture, three hours. Examines the impact of crime upon a variety of victims, e.g., victims of child and spousal abuse, burglary, arson, robbery, and rape. Considers such topics as victim compensation, victim-offender relationships, and the secondary victimization process.

J140 Prisons, Punishment, and Corrections (4). Lecture, three hours. A review of the history and present conditions regarding treatment of law violators. The conflict among rehabilitation, vengeance, and deterrent principles. Analysis of civil rights, racial antagonism, and politicalization in the contemporary American correctional system.

J141 Seminar in Criminal Justice (4). Seminar, three hours. Selected topics in the field of criminal justice examined. Issues vary with the interests of the instructor and students, and include such topics as violent crime, political crimes, police discretion, and civil rights of prison inmates. Prerequisite: Social Ecology J4.

J142 White-Collar Crime (4) F. Lecture, three hours. Criminal activity of business and corporate enterprise, both in terms of theoretical insights into the explanations of criminal behavior and in terms of social concerns with deterrence. The pioneering work of Edwin H. Sutherland and the contemporary investigations of Ralph Nader provide substantive background. Review of specific cases and specific forms of social response to white-collar crime.

J143 Theories of Punishment (4). Lecture, three hours. Survey of the various schools of thought regarding formal punishment theory. The purposes of legal sanctions are examined, including those of deterrence, rehabilitation, retribution, and incapacitation. Considers problems in realizing formal goals of punishment in practice.

J144 Criminal Law (4) W. Lecture, three hours. Deals specifically with the substantive nature of criminal law as opposed to criminal procedure which is concerned with how the criminal law is enforced. Considers three types of crime: offenses against the person, including laws of homicide, assault, and battery; offenses against habitation and occupancy, including laws of burglary and arson; and offenses against property, including laws of larceny, robbery, forgery, and counterfeiting.

J145 Government Crime (4). Lecture, three hours. Examines the legal, organizational, and political issues involved in the generation and control of government lawlessness. Readings present historical and theoretical perspectives in the abuse of government authority and the ability of the legal system to control such behavior.

J146 Social Control of Violence (4). Lecture, three hours. Studies the police as controllers of violence, users of violence, and as victims of violence. Prerequisite: Social Ecology J4.

J147 Law and Social Change (4). Lecture, three hours. Explores the relationship of law to its social setting by considering both law as a product of social change and law as a source or medium of change.

J148 Criminological Theory (4) W. Lecture, three hours. Explores the question of crime causation from a number of theoretical perspectives in the social sciences. Schools of thought examined include utilitarianism, positivism, human ecology, social structural approaches, social process (learning) theories, labeling, and radical-critical (political) perspectives.

J150 The Legal Profession (4). Lecture, three hours. Role of the legal profession in modern society, surveying the diverse professional roles lawyers play and comparing the American legal profession with that of other societies. The course will focus on the "litigation explosion," ethical problems, interactions between lawyers and other professionals, and training and socialization of new lawyers.

J164 Social Control of Delinquency (4). Lecture, three hours. Assumes familiarity with theories of juvenile delinquency, the juvenile justice system, and the elements of juvenile law. Using that knowledge, students explore current research in primary and secondary prevention of delinquency, and relevant case law. An original research project is required. Prerequisites: Social Ecology 10 and J132.

J181 Contemporary Legal Issues (4). Lecture, three hours. An in-depth analysis of current legal issues viewed from their political and constitutional perspectives. Issues studied are determined by instructor and student interest. Prerequisite: consent of instructor.

J182 Legal Sanctions and Social Control (4). Lecture, three hours. Examination of criminal sanctions as mechanisms of social control. Study to include the nature, function, and organization of courts as sanction generating institutions, and problems associated with punishing white-collar and corporate illegalities.

J190 Psychology and the Law (4). Lecture, three hours. Focuses upon the psychological assumptions of the American legal system and mental health aspects of the provision of criminal justice services. Topics include civil commitment, the insanity defense, competence to stand trial, jury selection, eye-witness identification, and the use of the police, courts, and correctional institutions in the prevention of behavior disorder.

Psychology and Social Behavior

S9 Introduction to Human Behavior (4) F, S. Lecture, three hours. An introduction to models of human development and mental health, and the application of the scientific method to the study of social behavior. The differences among individual, group, and societal levels of analysis and intervention are emphasized. (III)

S11 Human Development Over the Life Cycle (4). Lecture, three hours. Emphasis on patterns of growth and change in the development of self-identity, mastery and competence, and interpersonal relations during each of five life-cycle periods: infancy, childhood, adolescence, adulthood, and old age. Special attention to social, insti-

tutional, and environmental influences on the course of development. (III)

S45 AIDS Fundamentals (4) F. Lecture, three hours. Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond. Same as Biological Sciences 45.

S86 Introduction to Social Psychology (4). Lecture, three hours. Surveys studies of conformity, obedience, communication and persuasion, self-justification, causal attribution, aggression, prejudice, and interpersonal attraction. Emphasis on empirical research conducted to test social psychological theories and hypotheses. (III)

S100 Special Topics in Social Behavior (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of instructor. Prerequisites: Social Ecology S9 and, in some cases, the consent of instructor.

S101A-B Counseling Theory I, II (4-4) F (S101A). Lecture, three hours. Theoretical approaches and related counseling techniques examined, including client-centered, rational-emotive, transactional analysis, Adlerian, Gestalt, and behavioral counseling. Beginning relationship skills practiced in a laboratory section, using film and audio tapes. S101A same as Social Sciences 155C.

S104 Behavioral Assessment (4). Lecture, three hours. Laboratory-seminar exploration of diverse methods of assessing, analyzing, and recording behavior. Includes methods of direct behavioral observation, structured (analog) assessments, rating scales, interviewing, and self-monitoring. Focuses on the development of assessment skills and the application of these techniques in intervention and research programs. Prerequisites: Social Ecology 10 and consent of instructor.

S105 Developmental Disabilities (4). Lecture, three hours. Examines current knowledge about severe and persistent behavioral deficits, particularly mental retardation and childhood autism. Topics include intellectual assessment, malnutrition, chromosomal anomalies and inborn errors of metabolism, cultural-familial retardation, institutionalization and deinstitutionalization, and current trends in prevention and amelioration.

S106 Clinical Child Psychology (4) F. Lecture, three hours. Examines research and theory concerning childhood psychopathology. Topics include diagnosis and assessment, early identification of high risk children, fears and phobias, antisocial behavior, childhood psychoses, depression, hyperactivity, child abuse, and child advocacy.

S107 Child Therapies (4) S. Lecture, three hours. Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives.

S108 Social Ecology of Child Abuse and Neglect (4). Lecture, three hours. Emphasizes integration of psychological, social, and cultural factors for understanding the etiology of child maltreatment. Prediction, treatment, prevention, and policy issues also are covered.

S109 Cognitive Behavior Therapy (4). Lecture, three hours. Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy are reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity.

S110 Human Stress (4) W. Lecture, three hours. Stress is presented as a multidisciplinary topic. Biological, psychological, and sociological approaches to the study of adaptation-related disorders are reviewed. The environmental demands of contemporary urban life, such as noise, crowding, work pressure, and traffic congestion, are examined for their impact on personal health and behavior. Methods of stress reduction are also presented.

S111 Abnormal Behavior (4). Lecture, three hours. Survey of disorders organized by the diagnostic categories of the American Psychiatric Association. Interdisciplinary orientation combines environmental, psychological, and organic perspectives on etiology and treatment. Prerequisite: Social Ecology S9. Social Ecology SE10 recommended.

S113 Infant Development (4) F. Lecture, three hours. An overview of human development from conception through the first two years of life, covering processes and events in the domains of physical, emotional, social, and cognitive development.

S116 Peer Counseling (4). Lecture, three hours. Introduction to paraprofessional counseling and social support. Review of the effectiveness of psychotherapy and comparison of the analytic, humanistic, and behavioral approaches on their assumptions, goals, and verbal processes. Special counseling issues include crisis intervention, suicide prevention, death/dying, and ethics. Prerequisites: Social Ecology 10 and S9.

S117 Social Relationships (4). Lecture, three hours. Introduction to the major issues, concepts, and methods in the study of social relations. Central themes are the effect of social relations on psychological and physical well-being, the nature of social relations among different age groups and sociodemographic groups, the processes involved in the formation of love relationships and friendships, and strategies for helping the socially isolated and those whose existing relationships are dysfunctional.

S118 Interviewing and Assessment (4). Lecture, three hours. Topics covered include strengths and limitations of the interview as a method for gathering information; interview strategies and skills; unintended interviewer effects on the data gathered; content analysis and coding of interview data; and comparison of interview with questionnaire methods of assessment. Students gain substantial experience in interviewing and some experience in questionnaire design. Prerequisite: Social Ecology S9 or S11 or an introductory course in psychology.

S120 Violence in Society (4) W. Lecture, three hours. An overview of current theory and research on aggression followed by a focus on anger and violence as problems in individual and social functioning. The process and functions of anger are examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed.

S122 Human Sexuality (4) F, S. Lecture, three hours. A broad survey of human sexuality encompassing genetic factors, physiological and anatomical development, customary and atypical forms of behavior, reproductive processes, and cultural determinants.

S123 Adolescent Development (4). Lecture, three hours. An overview of psychological, social, and biological changes during adolescence. Research readings in selected areas such as changes in family relations, the positive developmental functions of peer relations, adolescents and the schools, and adolescents and work. Prerequisite: Social Ecology S9, S11, S127, or Social Sciences 7.

S125 Special Topics in Adult Development (4). Lecture, three hours. Examines the role of culture, social roles, and age norms on selected aspects of social and cognitive behavior. Different periods of adult development (early adulthood, old age) may be the focus of attention in different years. Emphasis is on developmental theory and on the research it has generated. Prerequisite: Social Ecology S11.

S127 Child Development (4) W. Lecture, two hours; laboratory, one hour. Examines physical, social, emotional, and intellectual growth and development between the ages of 2 and 15 years. Classroom seminar and course readings are supplemented by observation of children. Prerequisite: Social Ecology S9 or S11.

S132 Gerontology (4) S. Lecture, three hours. Introduction to the major issues, concepts, and methods in the study of aging. Examines stereotypes and myths associated with aging; reviews physiological

and psychological changes that accompany old age; distinguishes behavior changes due to aging *per se* from those due to historical and socioeconomic factors; considers political and social aspects of old age in contemporary society.

S136 Intimate Relationships (4) S. Lecture, three hours. Differing conceptions of the sources of enrichment in relations between individuals. Examination of issues affecting partnerships in contemporary society as they relate to the process of choosing a partner. Partnership and relationship skills in a communication framework are developed in a laboratory section.

S138 Attitude Organization and Change (4). Lecture, three hours. Definitions and measures of beliefs and attitudes and implications of attitude theory and research for social action programs. Covers source, message, and audience effects in communication and persuasion; psychological functions of beliefs and attitudes; and cognitive consistency theories.

S143 Attitudes and Behavior (4). Lecture, three hours. Cultural influences on attitudes and behavior. Situational versus attitudinal determinants of compliance and altruism. Attitude change and behavior change. Beliefs about the causes of behavior. Fishbein and Ajzen's theory of reasoned action.

S145 Perspectives on Child Rearing (4). Lecture, three hours. The impact of different child rearing practices on the development of personality and character. Examination of the effects on development of variations in the structure and dynamics of the family and school, and of the consequences of group care, working mothers, and the one-parent family. Prerequisites: Social Ecology S9 or S11, or any course in developmental psychology or human development.

S148 Development of Sex Differences (4) S. Lecture, three hours. Examination of research on how sexes differ in physiology, cognitive functioning, personality, and social behavior. Sex-differentiated development from the prenatal period through early adulthood is covered. Explanations for male-female differences are sought, focusing on biological (genetic, hormonal) and social (familial, cultural) mechanisms. Prerequisite: Social Ecology S9 or S11. Same as Humanities 172G.

S149 Moral Development Over the Life Span (4). Lecture, three hours. Introduction to moral reasoning and behavior in children, adolescents, and adults. Same as Social Sciences 156G.

S150 Child Health Psychology (4). Lecture, three hours. Exploration of the psychological antecedents, concomitants, and consequences of medical illnesses in children. Topics include children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; and the effects of a child's illness on the family.

S151 Developmental Psychopathology (4). Lecture, three hours. Research and theory concerning the origins, course, and outcomes of disordered behavior. Focuses on continuity and change in patterns of behavior; environmental challenges and buffers; stress and competence in children; vulnerable and invincible children; children of mentally ill parents; families at risk; and childhood antecedents of adult disorders.

S153 Television and American Culture (4). Lecture, three hours. Introduction to the phenomenon of television and its impact on the individual in American culture. Is television a menace or a boon to modern living? The historical roots of media and entertainment criticism are also examined.

S154 Work and the Family (4). Seminar, three hours. Focuses on the impacts of work on the family. Effects of employment and unemployment on mental health; relations between mothers' and fathers' involvement and quality of parenting; effects of parents' work lives on selected aspects of child and adolescent development. Prerequisite: upper-division standing or consent of instructor.

S156 Introduction to Clinical Psychology (4). Lecture, three hours. Overview of theories, techniques, and research methodologies in counseling and clinical psychology. Behavioral, cognitive, psychodynamic, psychoanalytical, rational-emotive, and multimodal approaches are examined. Lectures supplemented by group discussions and demonstrations. Prerequisites: Social Sciences 7 or equivalent and upper-division standing. Same as Social Sciences 1555.

S159 The Family (4) F. Lecture, three hours. Examination of Western family life from population and life course perspectives. Links between large-scale trends and changes in individual's family and household options.

S160 Advanced Seminar: Human Stress (4). Lecture, three hours. Provides an in-depth exposure to selected topics in the field of human stress. General topics include environmental determinants of stress, life events and social support, stress-related disturbances, occupational stress, and stress management interventions. Considerable attention is paid to theoretical and methodological issues in stress research. Prerequisites: Social Ecology S110 and permission of instructor.

S161 Family Law (4) S. Lecture, three hours. Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues.

S165 Sociology of Mental Health and Illness (4). Lecture, three hours. An overview of sociological contributions to the study of the nature, causes, and consequences of mental health and illness. Topics include social status and mental health, stressful life events, societal response to mental disorders, organization of mental health services in the community, problems of institutionalization and deinstitutionalization. Prerequisite: Social Ecology S9 or equivalent.

S166 Behavior Modification (4). Lecture, three hours. Overview of the principles and methods of behavior modification derived from psychological theories of learning. Considers applications of behavior techniques to treat childhood disorders, school problems, juvenile delinquency, marital and sexual problems, alcoholism, and eating disorders. Behavioral interventions in community and industrial settings also are considered.

S170 Personality (4) W. Lecture, three hours. Comparison of the major theories of personality. Provides a frame of reference for understanding lifestyles, development, maturity, and psychopathology. Emerging research themes are used to identify promising lines of personality theorizing. Prerequisite: sophomore, junior, or senior only.

S171 Social Conflict (4). Lecture, three hours. A social ecological analysis of social conflict at both the microscopic level (individual and group conflicts) and the macroscopic level (national and international conflicts). Multiple perspectives from psychology, sociology, and anthropology are used to explain the causes, dynamics, and resolution of conflicts.

S178 Social Ecology of Peace I (4) F. Lecture, three hours. Examination of differing definitions of the problem of achieving peace and the special problems of seeking peace in the nuclear age.

S179 Social Ecology of Peace II (4) W. Lecture, three hours. Examination of the relationship to achieving peace of strivings for national security and arms control, and of the basic formative and stabilizing institutions of society including government, religion, business, education, and the family.

S180 Social Ecology of Peace III (4) S. Lecture, three hours. Examination of alternate perceptions on approaches to peace, including plans to create an enduring peace and lower the risks of nuclear war.

S181 Leadership (4) W. Lecture, three hours. Examines current theory and research about the origins, aspects, and consequences of leadership. Discussions with recognized community leaders and experiential assignments designed to focus on student's own leadership potential and skills. Social Ecology 10 strongly recommended.

S184 Community Psychology (4) W. Lecture, three hours. Deals with the community orientation to the delivery of mental health care. The development of community mental health is described, and various models for its practice are delineated. Techniques of evaluating the efficacy of community programs are explored. Previous course in abnormal behavior highly recommended.

S185 Impacts of Divorce (4). Lecture, three hours. Examines divorce in historical, economic, and, primarily, psychological contexts, emphasizing recent research pertaining to the impacts of divorce on children, families, and society. Prerequisites: Social Ecology S9 or S11.

S186 Sports Psychology (4). Lecture, three hours. Psychological components of athletic performance with regard to scientific and practical issues. Roles of cognitive processes, physiological arousal, and emotion. Various personality factors related to performance, competition, and coaching. Strategies for improving athletic performance for individual and team competition.

S188 Social Psychology (4). Lecture, three hours. A systematic review of theory and research on the effects of social and situational factors upon individual beliefs, feelings, and actions. Topics include: group dynamics, social exchange, prosocial behavior, social cognition, causal attribution, intergroup conflict, and interpersonal attraction. Prerequisite: previous or concurrent enrollment in Social Ecology SE10.

S189 Mentors in Higher Education (4) F. Seminar, three hours. Discussion of roles and functions of mentors in higher education. Specific mentoring issues include: personal skills, training, the sociocultural role of mentoring in higher education, student affirmative action, history and politics in higher education. Prerequisite: consent of instructor.

Graduate Courses

200 Seminar in Social Ecology (4). Students are introduced to the classic and contemporary literature of human and social ecology and are expected to use the ecological paradigm to analyze social phenomena of interest to the differing subprograms.

201 Research Methods (4). In-depth analysis of the conceptualization of research and the design of appropriate research strategies. Topics covered are experimental design, questionnaire and interview construction, and observation techniques. Prerequisite: previous course work in statistics.

204 Research in Adolescence (4). Overview of selected areas of current and emerging areas of research. Potential topics: changes in family relations during adolescence; family processes and adolescent outcomes; the effects of hormones on behavior and mood; risk-assessment and risk-taking behavior; and research methods for the study of adolescents.

205 Issues in Social Psychology (4). Provides in-depth treatment of theoretical and empirical work relevant to selected topics in social psychology. Theories of attitude change, group dynamics, and attribution are applied to such problems as overpopulation, environmental degradation, media violence, and racial conflict.

206 Perceptions of Environmental and Health Risks (4). In-depth discussion of nonexpert assessment of risks presented by environmental carcinogens, technologies, natural hazards, and chronic and infectious diseases. Examines how the public interprets and uses aggregate risk/health data, and the role of cognition and emotion in risk perception. Prerequisite: graduate standing or consent of instructor.

207 Development Control Law and Policy (4). Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land use regulation. Traces development control historically and analyzes contemporary approaches to land use control which reflect environmental and economic development concerns. Prerequisite: graduate standing or consent of instructor.

208 Landscape Alternatives in Tourism Management (4). Concepts and designs in landscape ecology, landscape architecture, and cultural geography. International tourism and resort development as new catalysts of cultural landscapes. Landscape representation, transformation, conservation, interpretation, and marketing in international tourism. Interdisciplinary and international approaches to environmental and tourism management. Prerequisite: graduate standing or consent of instructor.

209A-B-C Practicum in Health Psychology (2-2-2). Explores research and practice in the field of health psychology, focusing on scientific and professional issues. Topics include assessment and diagnosis; communication skills; intervention approaches; collaboration, consultation, and referral; and ethical issues associated with at-risk populations research. Prerequisite: consent of instructor.

210 Seminar in Community Psychology (4). The historical development of community psychology and various models for its practice are described. An analysis of the persistence of problems within social systems is linked to social intervention strategies. The impact of the social environment on physical and psychological health is studied as a function of contemporary stress factors.

211 Attitude Theory and Research (4). Survey of theory and research on attitude organization and change. Topics include attitude measurement, ideology and the organization of belief systems, stereotypes, communication and persuasion research, theories of attitude change, and the relationship between attitudes and behavior. Prerequisite: graduate standing or consent of instructor.

213 Issues in Social Intervention (4). Issues in assessment and design of social interventions are covered. These include systems analysis in social settings, role of the social interventionist, problems of entry, assessment of systems ranging from small group through the community, and planning of social change.

214 Introduction to Survey Research (4). Overview of survey research methods. Topics covered include historical background, constraints and biases of survey research, and in-depth study of factors involved in the development, administration, and analysis of surveys.

215 Occupational Epidemiology (4). Methods to assess the distribution of disease and causal relationships between various environmental factors including those at the workplace and the health of at-risk populations. Same as Environmental Toxicology 270.

216 Preventive Medicine (8). Introduction to preventive medicine. Explores the descriptive and experimental approaches to recognizing causal associations of disease through the fields of biostatistics, epidemiology, health administration and occupational medicine.

219 Learning and the Control of Behavior (4). Principles and theories of classical and operant conditioning from laboratory experiments and demonstrations of the extensions of such studies into more clinical settings. Review of criticisms of learning theory applications. Repeated review of whether there is a learning theoretical basis to behavior control.

220 Principles of Human Development (4). Examines key concepts and research methods in the study of life span development. Considers different models of development; contextual and ecological perspectives; the nature of plasticity; continuity and change over time. Introduces research designs and statistical procedures for studying human development.

222 Seminar in Populations (4). Introduction to the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, marriage, and divorce. Case material primarily from the U.S. and other industrialized nations.

223 Seminar in Urban and Regional Analysis (4). Analysis of patterns of long-term urban and regional evolution with respect to population, sectoral economic change, economic development, and major shifts in the urban metropolitan and regional structures.

Analysis of patterns of industrialization at the national and international scales and their impact on urban and regional economies and societies. Conceptual and empirical models developed to analyze these trends are examined and discussed.

224 Methods in Social Epidemiology (4). Overview of advanced correlational methods including introductions to path analysis, ecological fallacy and cross-level inference, time-series analysis (including both least-squares and Box-Jenkins methods), cross-lag panel correlational analysis, and structural equation modeling (e.g., LISREL). Prerequisite: graduate standing or consent of instructor.

225 Seminar in Social Gerontology (4). Examines sociocultural and environmental influences on the social roles, behavior, and personal adjustment of middle-aged and older adults. Topics include changes in age composition and structure of populations, the functions of work and leisure, support systems, health care, and prospects for social intervention.

226 Youth and Society (4). Overview of current research and policy issues pertaining to adolescents and young adults. Topics include schooling and the failure of the schools; consequences of employment and unemployment; major currents in research on adolescence and in the policy domain; and the possible need for a national youth policy.

229 Assessment Methods in Child Development (4). Examination of the historical backgrounds, rationales, and applications of standard methods for assessing the development of children from infancy through adolescence. Extensive training in the use of some of these methods is included.

230 Social Problems and Public Policy (4). An examination of the processes of policy making, policy analysis, and policy evaluation, with particular attention to the role of experts. The emphasis of the course is on the uses and abuses of scientific information in policy making rather than on methods of policy development and analysis.

231 Psychosocial Dimensions of Chronic Illness (4). Social, psychological, and economic factors contributing to quality of health care delivery examined in relation to a prototypic chronic disease. Discussion of biological complications, medical approaches, lifestyle modifications, and psychosocial problems.

232 Seminar in Juvenile Delinquency (4). Examines the major theories of juvenile delinquency, prevention and control programs, and the administration of juvenile justice.

233 Personality and Psychopathology (4). Analysis of the major models of personality theorizing and research. Provides a frame of reference for understanding wholistic organizations of behavior (lifestyles). Developmental themes that are positive (maturity) and negative (psychopathology) also are emphasized.

235 Theories of Crime (4). Examines the positions of thinkers such as Bentham, Freud, Marx, Lombroso, Sutherland, as well as those of the current labeling theorists, who believe that crime is primarily a function of the distribution of power and of tactics of the strong denigrating acts of the weak.

236A-B Issues in Human Development (2-2). Examines selected issues that have current research salience and policy significance, including day care, parental employment and family functioning, sex differences in adults' well-being, developmental psychopathology, and the importance of social ties among the elderly. Emphasizes key ongoing debates. Prerequisite: Social Ecology 220 or consent of instructor.

238 Seminar in White-Collar Crime (4). Examines the illegal behavior of individuals who commit crimes in the course of their employment. Special attention is paid to ways in which power and organizational structure affect the behavior of the white-collar offender. Prerequisite: consent of instructor.

240 Law and Social Change (4). Examines laws and legal institutions and their interaction with society focusing on the issue of change. Law as a product of social change and law as a source of social change.

241A-B Seminar on Environment, Development, and Health (2-2). Highlights developments in environmental, developmental and health psychology, urban sociology, and public health. Emphasizes mental health aspects of person-environment transactions.

243 Spatial and Temporal Dimensions of Community (4). A systematic theoretical and methodological examination of local community organization and environment, focusing on potential for people to pursue everyday needs and activities. Application of theory and findings to work hours, childcare, commerce, recreation, medical care, and other aspects of physical and social planning.

244 Toxic Substances in the Environment (4). Examines sources, distribution, and cycling of toxic substances in the general environment, with emphasis on patterns of human exposure and mechanisms of damage. The toxic-substance standard-setting process is explored.

245 Social Science and the Legal Process (4). Examines social science methods for understanding and affecting the legal process. Emphasizes a current legal issue. The class provides, through its research and legal analysis, input into the adjudication of the issue under consideration.

246 Economics and Administration of Computing (4). Approaches to providing computing services in the context of large organizations. Determination of goals, selection of equipment, management of programming staff, coping with change, marketing services, keeping up with technology, pricing and other techniques for allocation of services, financing, vertical versus horizontal organizations.

248 Research on Subjective Well-Being (4). References to psychological well-being are abundant in the social science literature, yet the meaning of this global term differs dramatically across investigators. Examines alternative theoretical conceptions of psychological well-being and evaluates a variety of different measurement approaches. Prerequisite: graduate standing or consent of instructor.

250 Metropolitan Analysis Seminar (4). Students are introduced to sources of data which they will collect to test hypotheses concerning urban systems.

251 Seminar in Qualitative Criminological Analysis (4). Issues and strategies involved in the collection and analysis of qualitative data. Application of qualitative research methods with respect to criminology, law, and society. Prerequisite: graduate standing or consent of instructor.

252 Issues in Environmental Law and Policy (4). Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists. Prerequisite: consent of instructor.

253 Urban Planning (4). A survey of the models of urbanism assumed by professional planners and of the tools and powers at their command. Students assess the likely effectiveness of planning efforts given those tools and the complexity of urban dynamics.

254 Seminar on the Regulatory Process (4) S. Involves multidisciplinary investigation of the regulatory process. Topics include analysis of objectives of regulation; legal overview of the process in administrative law and organizational and historical overview. Examples include economic and environmental regulation, among others.

257 Social Indicators (4) S. A survey of the social indicators literature and presentation of individual projects attempting to devise indicators of social phenomena.

258 Seminar in Health Psychology (4). Interdisciplinary exploration of emerging fields of health psychology and behavioral medicine. Topics examined are: (a) role of stress in the development and treatment of medical problems; (b) sociocognitive determinants of health and illness; (c) interpersonal health transactions, e.g., physician-patient communication processes and role relationships; (d) behavioral approaches to medical problems such as diabetes, obesity, and hypertension. Focus on recent research findings, methodological strategies, and directions for future research.

259 Theories of Punishment (4). Introduction to the modern theories upon which criminal punishments are based, and how such purposes are met in the criminal justice system. Problems in systems of punishment including sentencing disparities and the punishment of white-collar and corporate crime.

260 Seminar on Teaching (4). Examination of the teaching process; research and theory of teaching as a discipline. Considerable attention given to the teaching process utilizing experiential techniques including analysis of video tapes of class members working as Teaching Assistants. Satisfactory/Unsatisfactory only.

261 Strategies of Theory Development (4) F. The goals of this course are (1) to examine key issues and controversies facing the development of social ecological theory, and (2) to encourage students to develop their own abilities as theorists. Strategies for enhancing creative hypothesis formation are emphasized.

262 Interpersonal Processes and Health (4). Examines traditions of research linking interpersonal processes to emotional or physical health. Topics include: role of social support in ameliorating stress, effects of social control on health-compromising behaviors, adverse effects of social relationships on health, causes of deficient social relationships. Prerequisite: consent of instructor.

264A-B Data Analysis (4). Course provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance. Prerequisite: graduate standing or consent of instructor.

267 Human Stress and the Environment as Stressor (4). Sources of stress from the biological, psychological, social, and physical environments are examined with respect to their impact on personal health, behavior, and the functions of social systems. Stress is presented as a multidimensional concept that can profitably be studied by an ecological analysis of determinants and outcomes.

271 Research Practicum in Environment, Development, and Health (4). A research practicum for postdoctoral and doctoral students. Seminar provides substantive discussion of student research topics and assistance in the completion of a grant proposal.

273 Biobehavioral Aspects of Health and Illness (4). Examines the behavior-physiology interactions of some major bodily systems: the nervous, cardiovascular, gastrointestinal, and endocrine systems. Analysis of normal and abnormal states of these systems as they relate to tissue injury, disease, and rehabilitation.

274 Seminar on Urban Sociology (4). Survey of current issues in urban sociology, including urbanization, city-hinterland relations, urbanism, metropolitan growth, migration, local community, metropolitan organization, power structure, and urban social psychology.

275 Special Topics in Social Ecology (4). Topics covered vary with interests of the instructor. Prerequisite: consent of instructor. May be repeated for credit.

276 Seminar in Social Deviance (4). Provides an in-depth examination of the field of social deviance. Major perspectives are examined in relation to policy issues concerning causation and control of deviant behavior.

277 Seminar in Child Health Psychology (4). This seminar examines diverse psychological and social ecological contributions to health and illness in children. Psychological, interpersonal, institutional, and physical environmental dimensions are explored. The focus is on contemporary research findings, the pitfalls and promise of scientific methodologies, future research directions, and policy implications.

278 Research Seminar on Divorce (4). Seminar, three hours. Focus on the psychological impact of divorce and its consequent child custodial arrangements on parents and children. The psychological impact is viewed in the broader context of society, including economic implications of divorce and societal changes that have accompanied the increase in divorce rate. Students participate in an empirical study of divorced families and attend lectures and discussions. Prerequisite: graduate standing or consent of instructor.

279A-B Pathways of Peace (4). Examination of plans to create an enduring world peace, reduce the risks of nuclear war, and assess the contributions of technology to peace. Emphasis on developing instructional materials.

282 Metals in the Environment (4). Examines the impacts of the use of more important metals on the environment and on individuals who work with them or who are environmentally exposed. Toxicological properties, techniques of analysis, and methods of control. Prerequisite: graduate standing or consent of instructor.

283 Seminar in Environmental Health and Quality (4). Concepts and principles of environmental health. Focuses on industrial hygiene, water and air quality, noise pollution, and environmental carcinogens. Past and present theory and implementation practices are discussed through review of legislative measures and enforcement procedures. The social and biological interactions surrounding each topic are examined.

284 Human Inference (4). Survey of research on human inference, judgment under uncertainty, and risk assessment. Focuses on how the cognitive strategies and heuristics people use to process information can sometimes lead to serious inferential errors and on how contextual factors influence judgment. Prerequisite: graduate standing or consent of instructor.

287 Employment and Family Functioning: Policy Issues (4). Examines the effects of current and potential policies on the well-being of working parents and their children. Focus on policy-making at various governmental levels and in the private sector. Prerequisite: graduate standing or consent of instructor.

288 Seminar in Environmental Psychology (4). Provides an overview of major theoretical and research perspectives within the field of environmental psychology. These perspectives are discussed in terms of their value for behavioral science projects launched in the community. Prerequisite: consent of instructor.

290A Applied Multivariate Statistics (4). Lecture, four hours; laboratory, two hours. Mathematical tools to organize and illuminate the multivariate methods. Multiple regression analysis. Multi-Dimensional Scaling and Cluster analysis. Statistical computing via MDS(x), BMDP, and SPSS. Prerequisite: graduate standing or consent of instructor. Same as Social Sciences 201A.

290B Applied Multivariate Statistics (4) S. Lecture, four hours; laboratory, two hours. Conceptual overview of multivariate statistical methods. Criteria for appropriate use. Meaning of key measurements within methods. Statistical computing via MDS(x), BMDP, and SPSS. Prerequisites: Social Ecology 290A and graduate standing, or consent of instructor. Same as Social Sciences 201B.

290C Sampling Techniques and Estimation Methods (4). Review of confidence interval estimates derived from simple random samples followed by presentation of techniques for improving precision of sample-generated estimates that take account of realistic issues. Methods for dealing with bias and nonsampling errors. Prerequisite: Social Ecology 166A-B-C or equivalent. Same as Social Sciences 201C and Management 290.

291 Program Evaluation (4). Students are introduced to the use of research techniques and statistical methods in assessing the effectiveness of social programs. Different evaluative models are discussed using examples of actual program evaluations. Prerequisites: Social Ecology 201 and two quarters of graduate-level statistics. Intended for students in the Ph.D. program.

292 Seminar in Evaluation Research (4). Intensive analysis of several issues in the field of evaluation research. Topics are drawn from current research issues involved in assessing the effectiveness of social reform projects (e.g., theory and models of evaluation research, role of evaluation researcher). Prerequisites: Social Ecology 201 and two quarters of graduate-level statistics, or consent of instructor.

293 Lead in the Environment and Society (4). The social ecology of lead use and presence in substance goods and the environment, examined from earliest prehistory to the present. Lead has particular impacts throughout human development. Public policy and surveillance are discussed. Guest lecturers. Prerequisite: graduate status or consent of instructor.

294 Seminar in Space Science Research (4). Examines the nature of problems during prolonged space flight aboard the proposed Space Station. Focuses on the enhancement and maintenance of human productivity in space. Guest speakers and NASA field trips. Prerequisite: Social Ecology E149 or consent of instructor.

295 Master's Thesis Research and Writing (4 to 8). Prerequisite: advancement to candidacy. Satisfactory/Unsatisfactory only.

296 Doctoral Dissertation Research and Writing (4 to 8). Prerequisite: advancement to candidacy. Satisfactory/Unsatisfactory only.

297 Field Studies (2 to 4) F, W, S

298 Directed Studies (2 to 4) F, W, S

299 Independent Study (4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

399 University Supervised Teaching (2 to 4) F, W, S. Required of and limited to Teaching Assistants. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only.

School of Engineering

William A. Sirignano *Dean*

The School of Engineering provides a stimulating intellectual environment for its community of scholars. The Departments of Civil, Electrical, and Mechanical Engineering offer undergraduate and graduate degree programs of study for individuals who will engage in the professional practice of engineering as it relates to design, development, research, and teaching in industry, government, or a university. A program in biochemical engineering is being developed at the graduate level. Programs at all levels emphasize the fundamentals underlying engineering, enabling the graduates to continue professional development through formal or informal study. The degree programs in the School of Engineering endeavor to provide UCI graduates with adequate intellectual tools for entrance into the profession and for continued renewal of their technical knowledge.

At the undergraduate level, a Bachelor of Science degree program in Engineering, with options in Civil, Electrical, or Mechanical Engineering, is offered respectively through the Civil, Electrical, and Mechanical Engineering Departments. Each of these options is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Courses in aerospace engineering are offered within the Mechanical Engineering option. Courses in computer engineering are offered within the Electrical Engineering option. Courses in computer science are offered external to the School of Engineering by the Department of Information and Computer Science (ICS).

Students with high achievement may declare a double major in Engineering and ICS. Early consultation with the School is advisable on this and other double-major programs, such as the one with Biological Sciences.

The undergraduate Engineering curriculum provides a firm background in the basic sciences through courses in physics, mathematics, and chemistry; a fundamental understanding of the engineering sciences through required basic engineering courses; and specialization via technical electives. The breadth requirement must be taken in the areas of Humanistic Inquiry, Social and Behavioral Sciences, and Writing.

It is not uncommon for engineering students to need *more than four years* to obtain their B.S. degree, particularly if part-time employment or major extracurricular activities make heavy demands on their time. Occasionally students can catch up by enrolling in summer sessions at UCI or at other institutions when a petition has been approved in advance.

Each of the three Departments offers graduate-level options leading to the M.S. and Ph.D. degrees in Engineering. The M.S. program requires 36 units to be completed; the exact selection of the courses is formulated through consultation between the student and a faculty advisor. Thesis and non-thesis programs are available. The Ph.D. program is less structured but more specialized than at the M.S. level. There is no set course requirement; rather, students must demonstrate various competencies as they progress toward the completion of their doctoral programs.

Engineering students may join any of a number of student organizations. Most of these organizations are professionally oriented and in many instances are local chapters of national engineering societies. A primary function of these groups is to provide regular technical and social meetings for students with common interests. Most of them also participate in the

annual Engineering Week activities, held each February, and in other School functions.

There are student chapters of the American Institute of Aeronautics and Astronautics (AIAA), the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), the Associated General Contractors of America (AGC), the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Transportation Engineers (ITE), the Mexican-American Engineering Society (MAES), the National Society of Black Engineers (NSBE), the Society of Women Engineers (SWE), the Structural Engineering Association of California (SEAOC), and the honorary engineering societies Tau Beta Pi, Eta Kappa Nu, and Chi Epsilon.

Faculty and committee meetings (except those involving personnel considerations) are open meetings; in addition to designated student representatives, all students are encouraged and expected to participate in the development of School policy. Student evaluation of the quality of instruction for each course is requested each quarter.

Institute for Combustion and Propulsion Science and Technology

The Institute for Combustion and Propulsion Science and Technology, an Irvine Research Unit, is a multidisciplinary activity addressing both fundamental and applied research in combustion. The Institute is described in greater detail on pages 78 and 290.

Research in Image Engineering

Image engineering synthesizes current research on technologies which utilize visual images. For more information, see page 285.

Degrees

Engineering B.S., M.S., Ph.D.

Honors

Undergraduate honors at graduation in the School of Engineering are awarded on the basis of grade point average, service to the School, service to the University, service to the community, or achievement in research projects. A general criterion is that students must have completed at least 72 units in residence at a University of California campus. Approximately 1 percent of the graduating class shall be awarded *summa cum laude*, 3 percent *magna cum laude*, and 8 percent *cum laude*, with no more than 12 percent being awarded honors.

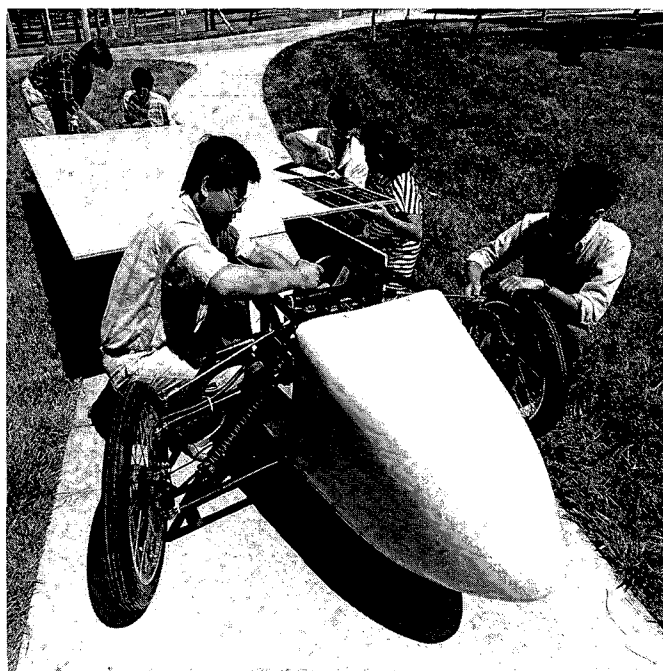
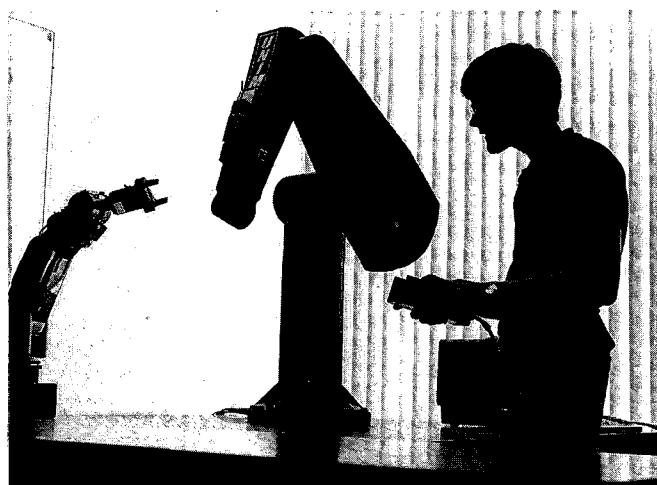
Additional awards in other categories are made throughout the academic year.

Education Abroad Program

Upper-division and graduate Engineering students can participate in a number of programs which offer unique opportunities for education and training abroad, usually after the completion of the sophomore year. The University's Education Abroad Program (EAP) offers engineering course work for UCI academic credit at a number of universities. Some of the EAP-affiliated engineering schools require proficiency in the host country's language, while others are English speaking. Study abroad may postpone the student's graduation for one or two quarters, depending primarily on the student's language preparation (which can begin in the freshman year), but the added experience can add to the student's maturity and professional competence. EAP students pay regular UCI fees and keep any scholarships they may have. The only extra cost is round-trip airfare. Detailed information is available on pages 61-62.



The undergraduate curriculum in the School of Engineering provides students with a firm background in the basic sciences, a fundamental understanding of the engineering sciences, and specialization via a variety of technical electives.



Undergraduate Program

NOTE: The undergraduate program leads to a B.S. degree in Engineering, with accredited options in Civil Engineering, Electrical Engineering, or Mechanical Engineering.

Admissions

Students should plan to enter the Engineering program at UCI only as freshmen or as juniors. The sequential nature of the Engineering program and the fact that many courses are offered only once a year also make it imperative that students begin their studies in the fall quarter. Applicants wishing to be admitted for the fall quarter, 1990 must have submitted their completed application forms during the priority filing period (November 1-30, 1989).

High school students wishing to enter the UCI Engineering program are advised to have completed four years of English, four years of mathematics, and one year each of physics and chemistry. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the Engineering program and is vital to receiving first consideration for admittance to the Engineering major during periods of restricted enrollments. Special attention will also be given to applicants who have submitted their SAT scores and three Achievement Test Scores by mid-January, 1990. All applicants for the School of Engineering must apply for admission to a specific Engineering department. These departments are Civil Engineering (CE), Electrical Engineering (EE), and Mechanical Engineering (ME).

If enrollment limitations make it necessary, unaccommodated Engineering applicants may be offered alternative majors at UCI.

A student may be admitted to a program (i.e., Civil, Electrical, or Mechanical Engineering) in the School of Engineering either from another major at UCI or from another college or university, including a community college. A student seeking admission to the School of Engineering from colleges and schools other than UCI must satisfy the University requirements for admission to advanced standing and must have completed the appropriate prerequisites for the junior-level courses to be undertaken in the School. Since the requirements vary from program to program, those contemplating admission in advanced standing to the School should consult the Office of Undergraduate Student Affairs, 114 Rockwell Engineering Center, (714) 856-6749, for the specific requirements of each program.

Transfer students satisfying the Statewide Articulation Agreement on Lower-Division Engineering Requirements (California Community Colleges-California State Universities-University of California) may complete the remaining requirements for the B.S. degree in six quarters at UCI, provided one or two designated courses are taken in summer session prior to entry. All transfer students should arrange for early consultation with the School's Undergraduate Student Affairs Office so that a smooth transition can be planned.

Advising

Academic advising is available from faculty advisors, academic counselors, and peer advisors. Freshmen and sophomores will find that most of their questions can be answered by the counselors and by the peer advisors in the School's Office of Undergraduate Student Affairs. All Engineering students must consult at least once every year with the academic counselors in the School's Undergraduate Student Affairs Office. Students also are encouraged to consult with their faculty advisors. Mechanical Engineering and Civil Engineering students are required to meet with their faculty

advisor at least once each year and whenever they desire to change their program of study.

Career Advising

The Career Planning and Placement Center provides services to UCI students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See page 71. In addition, special career planning events are held throughout the year including an annual Career Fair. Individual career counseling is available, and students have access to the Career Library which contains information on graduate and professional schools in engineering, as well as general career information.

Requirements for the Bachelor's Degree

University Requirements: See pages 52-55.

School Requirements: Credit for at least 180 units including the following:

Mathematics Courses: Twenty-four units—Mathematics 2A-B-C and 3A-B-D.

Basic Engineering Courses: Engineering E80, E101.

Basic Science Courses: Physics 5A-B-C, Physics 5LB-LC, and Chemistry 1A, 1LAE.

Breadth Courses: Thirty-six units—approved three-course clusters in (a) Humanistic Inquiry, (b) Social and Behavioral Sciences, and (c) Writing. Technology-oriented courses are not accepted for this requirement. At least one writing course, such as Engineering 190W, must be taken at the upper-division level. Note that the remaining breadth requirements therein stated are satisfied by the courses in Mathematics and Basic Sciences specified above. Breadth courses must include at least two lower-division courses in writing beyond the Subject A requirement and one upper-division course in writing.

Departmental Requirements: Departmental requirements for Civil, Electrical, and Mechanical Engineering options are described within each Department's section; see pages 279, 284, and 290, respectively.

Free Electives: Free electives include any academic course taken in addition to the degree requirements in order to meet the unit requirement for graduation.

Design Units: All undergraduate Engineering courses have both a total and a design unit value. Design unit values are indicated at the end of the course description. Each student is responsible for the inclusion of courses whose design units total that required by the program of study.

Duplication of Subject Material: Students who take courses which involve considerable duplication of subject material may not receive full graduation credit for all units thus completed.

Residence Requirement: In addition to the University residence requirement, at least 36 upper-division engineering units specified by each option must be completed successfully at the University of California.

Variations: Variations from the general School degree requirements may be made subject to the approval of the faculty of the School. Students wishing to obtain variances should submit petitions to the School's Undergraduate Student Affairs Office.

Programs of Study

A student who wishes to graduate from one of the accredited department options—Civil, Electrical, or Mechanical Engineering—should select the engineering and basic science courses listed in the respective program of study. Additional information on opportunities within each option is available from faculty advisors and academic counselors, who will also advise students on selection of courses. *Students must realize, however, that ultimately they alone are responsible for the planning of their own programs and for satisfactory completion of the graduation requirements.* Mechanical and Civil engineering students are required to have their program of study approved by their faculty advisor at least once each year and whenever they desire to change their program of study.

Students may substitute courses of their choosing for those required if they can substantiate the merits of the program of study and obtain prior approval from faculty of the School.

Students are cautioned about the structure of prerequisites which underlies most Engineering courses. The sample programs shown in each departmental description constitute preferred sequences which take into account all prerequisites.

Students must complete all of the required lower-division courses in the freshman and sophomore years in order to qualify for enrollment in any upper-division Engineering course.

School of Engineering policy does not permit the addition or deletion of Engineering courses after the third week of the quarter. Individual instructors may have more stringent add/drop policies; students should request a statement of the instructor's policy at the beginning of each quarter's class.

Qualified undergraduate students who have high academic standing, who have completed the necessary prerequisites, and who have obtained permission from the School's Undergraduate Study Committee may take certain graduate-level courses. Students are required to complete the lower-division writing requirement (see p. 54) during the first two years. Thereafter, proficiency in writing and computing (using a higher-level language such as BASIC, FORTRAN, and/or PASCAL) is expected in all Engineering courses.

Students in the School of Engineering, in accordance with general campus policy, are permitted to take courses in certain areas on a Pass/Not Pass basis. With respect to programs in Engineering, such areas are the breadth courses, *except* for courses taken in fulfillment of the UCI Subject A and upper-division writing requirements; any free electives; and any courses not submitted as fulfilling the graduation requirement.

Proficiency Examinations

A student may take a course by examination with the approval of the faculty member in charge of the course and the Dean of the School. Normally, ability will be demonstrated by a written or oral examination; if a portion of the capability involves laboratory exercises, the student may be required to perform experiments as well as to take a written examination. The proficiency examination is not available for any course a student has taken before at UCI.

Undergraduate Acceleration toward the M.S. Degree in Engineering

Exceptionally promising seniors may, with permission of the Undergraduate Study Committee, take graduate-level Engineering courses in addition to the undergraduate degree requirements. After attaining the B.S. degree and upon

acceptance to the M.S. program in Engineering, the student may petition for application of up to eight units of excess credit toward the M.S. degree. If the petition is approved by the School and the Dean of Graduate Studies, the student could complete the M.S. degree in three quarters of residence as a graduate student even while serving as a teaching or research assistant.

Graduate Program

Graduate study is offered leading to the M.S. and Ph.D. degrees in Engineering. The graduate program has concentrations in Civil, Electrical, and Mechanical Engineering. A program in biochemical engineering, emphasizing bioreactors, recombinant cells, and separation operations, is currently being developed. Civil Engineering focuses upon three major thrust areas: structural mechanics and earthquake engineering; transportation planning and urban systems; and water resources. The concentration in Electrical Engineering includes the three major thrust areas of computer engineering, optical and solid state devices, and systems and signal processing. The thrust areas in Mechanical Engineering include the thermal and fluid sciences, combustion and propulsion, control systems, robotics, materials, and aerospace engineering.

Admissions

For information on requirements for admission to graduate study at UCI, see page 79. Admission to graduate standing in the School of Engineering is generally accorded those possessing a B.S. degree in engineering or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some cases, undertake remedial work; if completed at the stipulated academic level, they will be admitted to full graduate standing. Those admitted from an allied field may be required to take supplementary upper-division courses in basic engineering subjects.

The Graduate Record Examination General Test is required of all applicants.

Master of Science in Engineering

The M.S. degree is normally attained by one of two routes: Plan I, a thesis, or Plan II, a comprehensive examination.

For the M.S. degree with thesis, a minimum of 36 approved units is required, of which at least 20 must be nonresearch graduate units (courses numbered 200-289). A maximum of eight M.S. thesis research units (296) may be submitted. The M.S. thesis must demonstrate the student's capability of undertaking an original study and carrying it through to a conclusion satisfactory to at least three members of the faculty.

For the M.S. degree with comprehensive examination, a minimum of 36 approved units are required, of which at least 24 must be nonresearch graduate units (numbered 200-289). In Electrical Engineering the comprehensive examination takes the form of a core course program (see Graduate Courses in Electrical Engineering). In Civil and Mechanical Engineering, the comprehensive examination includes a project and a

report. The detailed program of study for each M.S. student is formulated in consultation with an advisor who takes into consideration the objectives and preparation of the candidate and the specific requirements of the School. Students should acquaint themselves with core course requirements in the various concentrations of the M.S. program. The program of study must be approved by the faculty of the School. Full-time students must carry 12 units per quarter and should be able to complete the requirements for the M.S. degree in three to four quarters.

M.S. students with theses or projects have to meet departmental research requirements as a research assistant or equivalent, with or without salary.

Further details of the M.S. program in the Civil, Electrical, and Mechanical Engineering Departments are presented in the individual departmental descriptions.

Part-Time Study

Those students who are employed may pursue the M.S. degree on a part-time basis, carrying fewer units per quarter. Since University residence requirements necessitate the successful completion of a minimum number of units in graduate or upper-division work in each of at least three regular University quarters, the part-time student should seek the advice of the graduate coordinator in the School of Engineering and the approval of the chair of the appropriate program (CE, EE, or ME). M.S. programs must be completed in four calendar years from the date of admission. Students taking courses in University Extension should consult the section on Transfer of Courses below.

Transfer of Courses

Upon petition, a limited number of *graduate-level courses* taken through University Extension, on another campus of the University, or in another accredited university may be credited toward the M.S. degree after admission. With the exception of work undertaken in another Graduate Division of the University, transfer credit will not be applied to the minimum required units in 200-series courses. For further information, see page 83.

Doctor of Philosophy in Engineering

The doctoral program is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with an advisory committee which takes into consideration the objectives and preparation of the candidate. The program of study must be approved by the faculty of the School.

There are no specific course requirements, but there are several milestones to be passed: admission to the Ph.D. program by the faculty of the School; within one year of arrival on the campus, passage of a preliminary examination or similar assessment of the student's background and potential for success in the doctoral program; meeting departmental teaching requirements, which can be satisfied through service as a teaching assistant or equivalent; research preparation; formal advancement to candidacy through qualifying examination conducted on behalf of the Irvine division of the Academic Senate; completion of a significant research investigation; and completion and defense of an acceptable dissertation. There is no foreign language requirement. Ph.D. students have to meet departmental research requirements as a research assistant or equivalent, with or without salary. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. For at least the final two years of the doctoral program it is expected that the student will be a full-time resident in the School. Doctoral programs must be completed in seven calendar years from the

date of admission. Financial aid, such as research and teaching assistantships, is available.

Further details of the Ph.D. program in the Civil, Electrical, and Mechanical Engineering Departments are presented in the individual departmental descriptions.

General Engineering

Faculty

Nancy A. DaSilva, Ph.D. California Institute of Technology, *Assistant Professor of Biochemical Engineering* (recombinant cell bioengineering)

Juan Hong, Ph.D. Purdue University, *Assistant Professor of Biochemical Engineering* (biochemical engineering bioseparations)

Henry C. Lim, Ph.D. Northwestern University, *Professor of Biochemical Engineering* (biochemical, bioreactor engineering)

Lecturers

Brad J. Henderson, M.A. University of Southern California, *Lecturer in Engineering* (oral and written technical communication)

Frederick G. Sawyer, Ph.D. Polytechnic University of New York, *Lecturer in Engineering* (oral and written technical communication), Registered Professional Engineer

General Engineering Undergraduate Courses

NOTE: With the exception of E1 and EE181A-B-C, the undergraduate courses listed below are open *only to students majoring in Engineering*. All other majors must petition for permission to enroll.

E1 Introduction to Engineering (1) F. Nature of engineering; preparation for profession; nature of civil, electrical, and mechanical engineering; related fields of engineering; employed engineer; ethical and legal aspects of profession; case studies in project design, implementation, and operation. Pass/Not Pass only. (Design units: 0)

E10 Computational Methods in Engineering (4) F, W, Summer. Procedures and procedure followers, algorithms and flow charts, computer languages, subprograms. Computer macro- and microelements, number systems. Methods of differentiation, integration, curve fitting, list processing. Error analysis. Must qualify in BASIC and FORTRAN at end of course through computer use. E10 and Information and Computer Sciences 1A may not both be taken for credit. Prerequisite: Mathematics 2A. (Design units: 0)

E30 Statics (3) W, Summer. Forces, equilibrium, structures, distributed forces, friction, virtual work, moments of inertia. Prerequisites: Physics 5A, Mathematics 2A. (Design units: 0)

E50 Engineering Economics (4) F. Time value of money, methods of conducting economic analysis, cost concepts and costing, benefit cost analysis, sensitivity and risk analysis, economics of the organization. (Design units: 0)

E80 Dynamics (3) S, Summer. Rigid body dynamics, momentum, and energy principles; modeling and analysis of mechanical systems. Prerequisites: Physics 5A and Mathematics 3B. (Design units: 0)

E92 Engineering and Computer Science Laboratory (ECSEL) (2-4) F, W, S. Comprehensive academic support designed primarily for underrepresented or underprepared students in Engineering, ICS, or selected areas of the physical sciences. Typical program activities: tutoring, study skills, career planning, self-esteem enhancement,

library research techniques, graduate study planning, and independent studies. Workload credit only. Pass/Not Pass only. Students may receive up to 12 units of credit. Same as Information and Computer Science 92. (Design units: 0)

E98 Group Study (1 to 4). Group study of selected topics in engineering. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

E101 Introduction to Thermodynamics (3) F, Summer (occasionally). Thermodynamic principles; open and closed systems representative of engineering problems. Prerequisites: Physics 5B, Mathematics 3D, English and Comparative Literature WR39B-C. (Design units: 0)

E150 Introduction to Biochemical Engineering (4) W. Application of engineering principles to biochemical processes. Topics include: microbial pathways, energetics and control systems, enzyme and microbial kinetics, and the design and analysis of biological reactors. Prerequisites: Chemistry 1A and Mathematics 2B. (Design units: 1)

E160 Reaction Kinetics and Reactor Design (4) W. Introduction to quantitative analysis of chemical reactions and chemical reactor design. Reactor operations including batch, continuous stirred tank, and tubular reactor. Homogeneous and heterogeneous reactions. Prerequisites: course work in general chemistry or calculus, or consent of instructor. (Design units: 2)

E190 Communications in the Professional World (4) F, W, S. Workshop in technical and scientific writing. Oral presentation with video monitoring. Communication with various publics. Real-world professionalism. Prerequisites: junior or senior standing in Engineering and completion of the lower-division writing requirement. (Design units: 0)

E192 Ethical Issues in Engineering (4) S. Application of ethical theory to moral problems in engineering. Topics include exercise of conscience and free expression within corporations; basic professional obligations to the public; role of values in safety decisions; ethics codes; whistle-blowing. Case studies. Prerequisite: Completion of lower-division writing requirement. Same as Philosophy 172. (Design units: 0)

General Engineering Graduate Courses

E222 Bioseparation Processes (3) S. Recovery and purification of biologically produced proteins and chemicals. Basic principles and engineering design of various separation processes including chromatography, electrophoresis, extraction, crystallization, and membrane separation. Prerequisite: Engineering E150 or consent of instructor.

E240 Bioengineering with Recombinant Microorganisms (3) S. Engineering and biological principles important in recombinant cell technology. Host/vector selection, plasmid propagation, optimization of cloned gene expression, metabolic engineering, protein secretion, experimental techniques, modeling of recombinant cell systems. Prerequisites: Engineering E150, E160, or consent of instructor.

E250 Advanced Biochemical Engineering (3) W. Engineering studies of biological processes including enzyme reactions and fermentation processes with genetically engineered microorganisms and animal and tissue cells. Development of production and recovery processes for biochemicals. Prerequisites: Engineering E150, E160, or consent of instructor.

E260 Reaction Engineering (4) F. Advanced topics in reaction engineering, reactor stability analysis, diffusional effect in heterogeneous catalysis, energy balance, optimization of reactor operation, dispersed phase reactors. Prerequisite: Engineering E160.

E262A Bioreactor Engineering I (3) W. Biochemical reactions and bioreactors of various types. Mathematical modeling of various biochemical reactions and design and analysis of various bioreactors. Prerequisite: Engineering E160 or consent of instructor.

E262B Bioreactor Engineering II (3) S. Analysis, optimization, and control of suspension and immobilized bioreactors and recombinant cell reactors. Prerequisite: Engineering E262A or consent of instructor.

E299 Individual Research (varies) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor.

Department of Civil Engineering

Faculty

- Medhat A. Haroun, Ph.D. California Institute of Technology, *Department Chair and Professor of Civil Engineering* (structural and earthquake engineering), Registered Professional Engineer
- Alfredo H-S Ang, Ph.D. University of Illinois, Urbana, *Professor of Civil Engineering* (reliability engineering, structural and earthquake engineering), Registered Professional Engineer
- David Dougherty, Ph.D. Princeton University, *Assistant Professor of Civil Engineering* (geohydrology, transport in porous media, numerical methods)
- Gary L. Guymon, Ph.D. University of California, Davis, *Professor of Civil Engineering* (water resources, geohydrology, mathematical modeling), Registered Professional Engineer
- Michael G. McNally, Ph.D. University of California, Irvine, *Assistant Professor of Civil Engineering* (transportation modeling, travel behavior)
- Betty H. Olson, Ph.D. University of California, Berkeley, *Professor of Social Ecology and Civil Engineering* (aquatic microbiology environmental chemistry, water resources)
- Terese M. Olson, Ph.D. California Institute of Technology, *Assistant Professor of Civil Engineering* (water resources, environmental chemistry)
- Gerard C. Pardo, Ph.D. Stanford University, *Associate Dean, Undergraduate Affairs, and Professor of Civil Engineering* (structural analysis, experimental structural dynamics), Registered Professional Engineer
- Wilfred W. Recker, Ph.D. Carnegie-Mellon University, *Professor of Civil Engineering and Director, Institute of Transportation Studies-Irvine* (transportation modeling and urban systems)
- Stephen G. Ritchie, Ph.D. Cornell University, *Department Vice Chair and Associate Professor of Civil Engineering* (transportation engineering systems, knowledge-based expert systems)
- Jan Scherfig, Ph.D. University of California, Berkeley, *Professor of Civil Engineering* (water resources, treatment processes, reclamation, toxicity), Registered Professional Engineer
- Robin Shepherd, Ph.D. University of Canterbury; D.Sc. University of Leeds, *Professor of Civil Engineering* (structural dynamics, earthquake-resistant design), Registered Professional Engineer
- Roger F. Teal, Ph.D. Tufts University, *Associate Professor of Civil Engineering* (transportation policy, urban interactions)
- Roberto Villaverde, Ph.D. University of Illinois, Urbana, *Associate Professor of Civil Engineering* (structural and earthquake engineering)

Lecturers

- Keith W. Blinn, J.D. Marquette University, *Lecturer in Civil Engineering* (governmental regulations, environmental policy and law)
- John M. Coil, M.S. University of California, Berkeley, *Lecturer in Civil Engineering* (structural design and analysis), Registered Structural Engineer
- Eugene Colombini, M.B.A. California Coast University, *Lecturer in Civil Engineering* (construction management)
- L. James Ewing, Jr., M.S. University of California, Irvine, *Lecturer in Civil Engineering* (water and wastewater systems, reclamation and reuse), Registered Professional Engineer
- Fong-Ping Lee, Ph.D. University of Texas, Austin, *Lecturer in Civil Engineering* (transportation, computer-aided engineering)
- W. H. Scholz, Ph.D. University of Oklahoma, *Lecturer in Civil Engineering* (construction and project management)
- Edward L. Stanton, Ph.D. Case Western Reserve University, *Lecturer in Civil Engineering* (structural stability), Registered Professional Engineer
- Williston L. Warren, M.S. University of California, Irvine, *Lecturer in Civil Engineering* (surveying, computer-aided drafting)

Civil Engineering has been described as the art of harnessing the great powers of nature for the use and convenience of man. The success of this endeavor is evident all around us. The inhospitable arid plain which greeted the early settlers in Southern California has been transformed into a thriving metropolis largely by the application of civil engineering.

The goal of the Civil Engineering curriculum is to prepare graduates for a career in practice, research, or teaching. At the undergraduate level a common core of fundamental subjects is provided, with opportunity to specialize in the senior year. Graduate opportunities are in three major thrust areas: structural analysis, design, and reliability; transportation and urban systems; and water resources and environmental engineering.

The career opportunities in civil engineering are varied as in any other discipline. Graduates may look forward to long-term careers in major corporations, public bodies, the military, private consulting firms, or to being self-employed in private practice. History has shown a civil engineering education to be a good ground for many administrative and managerial positions.

Undergraduate Option in Civil Engineering

Bachelor of Science Degree

The program objective is to prepare civil engineering graduates for a career in the profession or for entry into graduate school. The curriculum provides the opportunity to obtain a firm foundation in engineering science and to develop the techniques of analysis and design, which are basic for the successful practitioner. Emphasis is placed on developing problem-solving skills.

Requirements for the Bachelor's Degree with the Civil Engineering Option

University Requirements: See pages 52-55.

School Requirements: See page 276.

Departmental Requirements: Students must complete the following core courses: Chemistry 1B and 1LBE; Engineering E10, E30, E50, ME130A, CE1, CE5, CE105, CE109, CE125, CE131 and CE131L, CE150, CE151, CE170, CE185, and either CE128, CE153, or CE175 (capstone design courses in the student's chosen area of concentration); one environmental studies course from an approved list; two technical elective courses in the student's chosen area of concentration, selected among structures, transportation, or water resources; and technical electives containing enough units of design to aggregate 23 units. Design unit values are indicated at the end of each course description. In addition, students must select a second, different area of concentration from among either structures, transportation, water resources, or construction and project management, and take two technical elective courses in the second concentration.

Upper-division students must obtain their faculty advisor's approval of the courses to be taken each quarter.

Program of Study

The sample program of study chart is typical for the accredited option in Civil Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students must have their programs approved by their faculty advisor.

Graduate Concentration in Civil Engineering

Master of Science Degree

The M.S. degree reflects achievement of an advanced level of competence for the professional practice of civil engineering. Two routes are available to those working toward the M.S. degree: (1) successful completion of 36 approved units (which include a project) and a comprehensive examination, or (2) a combination of academic course work and a thesis (typically 28 approved units of course work coupled with a thesis counting for 8 units). All students must present their thesis research findings in a public seminar.

Doctor of Philosophy Degree

The Ph.D. degree indicates attainment of an original and significant research contribution to the state-of-the-art in the candidate's field, and an ability to communicate advanced engineering concepts. The requirements for the Ph.D. degree include an early assessment of the student's research potential (this may consist of a preliminary examination), research preparation, passing the qualifying examination, advancement to candidacy, completion of a significant research investigation, and the submission and oral defense of an acceptable dissertation.

Civil Engineering Undergraduate Courses

CE1 Engineering Drawing and Computer-Aided Drafting (4) W.

Elements of engineering drawing and graphics. Introduction to graphic status and descriptive geometry. Computer-aided graphical analysis. Fundamentals of computer-aided drafting systems to construct drawings. Prerequisite: Engineering E10. (Design units: 0)

CE5 Land Measurements and Analysis (4) S. Introduction to surveying and land measurement. Use of the level and transit equipment, legal descriptions, subdivisions, topographic surveys, mapping vertical and horizontal curves. Analysis of surveying field data using manual methods, computer programs, and the COGO software system. Prerequisite: Engineering E10. (Design units: 0)

CE105 Civil Engineering Methods: Analysis of Uncertainty (4) S. Introduction to probability, statistics, and decision analysis for civil engineers. Consideration of uncertainties involved in engineering problems. Prerequisite: Mathematics 3A. (Design units: 0)

CE109 Civil Engineering Systems and Design (4) S. Introduction to procedures for planning, designing, and managing large-scale civil

Sample Program of Study—Civil Engineering

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Elective E10 Breadth	Math 3B Physics 5C, 5LC Chemistry 1A, 1LAE E50	E101 CE150 CE185 CE125	CE Elective CE Elective Elective Breadth
Winter	Math 2B Physics 5A CE 1 Breadth	Math 3A E30 Chemistry 1B, 1LBE Breadth	ME130A CE151 Breadth Breadth	CE Elective CE Elective Environmental Elective Breadth
Spring	Math 2C Physics 5B, 5LB CE5 Breadth	Math 3D E80 Breadth Elective	CE170 CE105 CE109 CE131, CE131L	Capstone Design Course CE Elective Elective Elective

engineering systems. Emphasis on development of computer-based optimizing methods and on the economic and social forces and constraints of the environment in which large systems occur. Prerequisites: Engineering E10, E50. (Design units: 0)

CE110 Legal Aspects of Engineering (3) F. Overview of legal and ethical concepts. Topics include forms of business organization; contracts, with particular reference to construction and manufacturing activities; negligent and criminal conduct; labor and employee safety legislation; protection and transfer of intellectual property. Prerequisite: junior standing. (Design units: 0)

CE112 Introduction to Construction Project Management (3) W. Management concepts of a project from conception to start-up. Course project required. Prerequisite: upper-division standing. (Design units: 1)

CE113 Introduction to Construction Project Control (3) S. Concepts and methods required to monitor and control construction projects from conceptual through operational phases. Case study and project assignment. Current industry practice emphasized. Prerequisite: upper-division standing. (Design units: 1)

CE120 Transportation Planning and Analysis (4) F. Fundamental concepts in planning, design, and management of transportation and urban systems. Topics: transportation planning process, travel demand analysis, system performance, and policy evaluation. Prerequisite: Engineering E50. (Design units: 1)

CE121 Transportation Forecasting I (4) F. Development of the theoretical foundations of models employed in the transportation planning and analysis process, and applications of these models to empirical data. Focuses on aggregate and disaggregate techniques of land use forecasting, trip generation and trip distribution. (Design units: 1)

CE122 Transportation Forecasting II (4) W. Emphasis on theory and applications of models of mode split, transportation supply, and highway networks. Techniques for project evaluation. Design and analysis of system alternatives for an urban area. (Design units: 3)

CE125 Transportation Engineering (4) F. Introduction to analysis and design of fundamental transportation system components, such as highways and traffic systems, individual vehicle motion, basic elements of geometric design, vehicle flow and elementary traffic flow relations, capacity analysis, pavements and pavement management systems. Prerequisite: junior standing. (Design units: 2)

CE127 Traffic Engineering (4) W. Introduction to urban traffic engineering fundamentals, traffic studies, traffic flow theory, capacity analysis of freeways, highways, urban streets, and intersections. Traffic control. Use of simulation models for analysis of intersection capacity and control problems and design of intersectioned network control strategies. Prerequisite: CE125 or consent of instructor. (Design units: 1)

CE128 Computer-Aided Geometric Design for Civil Engineers (4) S. Introduction to the use of computer-aided design techniques in the provision of efficient roadway alignments, gradients, and other features to accommodate the safe movement of traffic. Instruction based on the VANGO computer graphics system. Prerequisites: Engineering E10 and CE 125. (Design units: 4)

CE130 Geology for Engineers and Scientists (5) W. Principles of geology for engineers and applied earth scientists. Rock characteristics and formation, geologic structure, erosion, and groundwater. Interpretation of geological maps and geophysical data. Applications to geologic hazards such as earthquakes, slope stability, and tunneling problems. Prerequisites: Chemistry 1B, Physics 5B, and junior standing. (Design units: 0)

CE131 Soil Mechanics (3) S. Mechanics of soils, composition and classification of soils, compaction, compressibility and consolidation, shear strength, seepage, bearing capacity, lateral earth pressure, retaining walls, piles. Prerequisites: CE150 and ME130A. (Design units: 0)

CE131L Soil Mechanics Laboratory (2) S. Laboratory procedures of soil testing for engineering problems. Corequisite: CE131. (Design units: 0)

CE132 Foundation Design (3) W. Application of soil mechanics principles to the design of shallow and deep foundations, retaining walls, sheet piles, cofferdams, piers, and caissons. Prerequisite: CE131. (Design units: 3)

CE150 Strength of Materials (5) F. With laboratory. Stress and strain. Analysis of gross internal forces (axial and shearing forces, bending and twisting moments) and stress and deformations which they induce in structural members. Prerequisite: Engineering E30. (Design units: 0)

CE151 Structural Analysis and Design (4) W. Fundamentals of structural engineering; deformations of statically determinate structures, stability of structural members, design of structural members (steel, reinforced concrete, and composite); and design and analysis of simple indeterminate structures. Prerequisite: CE150. (Design units: 2)

CE152 Computer Methods of Structural Analysis (4) S. Matrix techniques for indeterminate framed structures: flexibility and stiffness method. Computer techniques using the stiffness method. Structural dynamics of single, multi, and infinite degree of freedom systems. Computer techniques for frequencies and modes. Prerequisite: CE151. (Design units: 0)

CE153 Structural Design (4) F. Fundamentals of reinforced concrete, steel, timber design. Fundamentals of dead and live load factors. Design project which includes site planning, footing, framing, roof design of two-story tilt-up wall building. Prerequisite: CE151. (Design units: 4)

CE154 Reinforced Concrete Design (4) W. Ultimate strength design of systems of reinforced concrete beams, slabs, columns, and footings. Prerequisite: CE153. (Design units: 3)

CE155 Structural Steel Design (4) S. Design in steel of tension members, beams, columns, welded and bolted connections; eccentrically loaded and moment resistant joints; plate girders. Plastic design; load and resistance factor design. Composite construction; introduction to computer-aided design. Prerequisite: CE153. (Design units: 4)

CE164 Chemistry for Environmental Engineering (4) F. With laboratory. Basic concepts from general, physical, organic, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics applied to acid-base chemistry, mineral and gas solubility, coordination, redox reactions, and adsorption. Prerequisites: Chemistry 1C; Engineering E101 or consent of instructor. Same as Social Ecology E161. (Design units: 0)

CE168 Sociopolitical Aspects of Environmental Quality (3) S. Social, political, legal, and technical aspects of developing major civil systems in an environmentally conscious society. Impact of current environmental framework upon development activities; examination of sociopolitical process by which environmental quality concerns are reconciled with infrastructure creation. Case studies of water, transportation, energy, and housing projects. (Design units: 0)

CE170 Hydraulic Systems (4) S. With laboratory. Analysis and design of turbomachinery, pipe networks, storm drainage, sewerage, open channel flow, controls, hydraulic appurtenances, irrigation and water supply systems. Computer applications and problems included. Prerequisite: ME130A. (Design units: 2)

CE171 Introduction to Hydrology (4) F. Analysis of hydrologic systems. Hydrological cycle, climate and meteorology, natural streams, rainfall-runoff relationships, flood hydrology, frequency/risk analysis, stream routing, groundwater hydrology, water supply and use. Mini-design projects and computer applications included. Prerequisites: ME130A and CE170; CE130 recommended. (Design units: 2)

CE172 Groundwater Hydrology (4) W. Introduction to analysis and design for groundwater problems. Topics include hydrological cycle, occurrence and distribution, Darcy's law, mass balance, aquifers, flow nets, resource testing and evaluation, geotechnical applications, groundwater contamination. Mini-design projects and computer applications included. Prerequisites: ME130A and CE170; CE130 recommended. (Design units: 2)

CE173 Water Resources Quality (4) W. Analysis and design of water treatment and reclamation systems. Physical, chemical, and biological water quality parameters. Water quality laws. Federal and State standards. Treatment system design concepts. Laboratory, field trip. Corequisite: ME130A. Prerequisite: Chemistry 1B. (Design units: 2)

CE175 Design of Water and Waste Treatment Systems (4) S. Design of unit processes for the treatment of water and waste water. Concurrent introduction to materials and selection, design layout, mass balances, control systems, and plans and specifications. Field trip and projects included. Prerequisites: two courses from CE164, CE171, CE172, CE173. (Design units: 4)

CE185 Numerical Methods in Engineering (4) F. Numerical solution of problems occurring in engineering practice. Computational errors, direct and iterative methods for linear systems of equations, interpolation, differentiation, quadrature, nonlinear equations, least squares, differential equations. Use of computers required. Prerequisites: Mathematics 3A and 3D. (Design units: 0)

CE198 Group Study (4-4-4) F, W, S. Group study of selected topics in engineering. Prerequisite: consent of instructor. (Design units: varies)

CE199 Individual Study (1 to 4 per quarter) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

Civil Engineering Graduate Courses

CE206A Knowledge-Based Expert Systems I (3) W. Introduction to basic concepts and characteristics of knowledge-based expert systems in civil engineering. Scope of expert systems, difference from conventional computer programs, architecture, knowledge representation, knowledge engineering, building and expert system, development tools. Prerequisite: graduate standing or consent of instructor.

CE206B Knowledge-Based Expert Systems II (3) S of odd years. Advanced study of selected topics in building knowledge-based systems for civil engineering applications. Topics include: knowledge engineering, knowledge representation and architectures, techniques for reasoning under uncertainty, development tools; case study applications. Prerequisite: graduate standing or consent of instructor.

CE220A Travel Demand Analysis I (3) W. In-depth introduction to travel demand modeling techniques. Methods of multivariate data analysis examined in context of application in development of travel choice models including mode, route, destination choice. Prerequisite: knowledge of elementary probability and statistics.

CE220B Travel Demand Analysis II (3) S of even years. Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis. Prerequisite: CE220A.

CE221 Analysis of Transportation Supply (3) S. Analysis and modeling of performance characteristics and costs of transportation modes. Performance relations, cost models, analytic models, and simulation models of transportation modes and services.

CE222 Transit Systems Planning (3) F of even years. Planning methods for public transportation in urban areas. Technological and operating characteristics of vehicles, facilities, and systems. Short-range planning techniques: data collection and analysis, demand analysis, mode choice, operational strategies, financial analysis. Design of systems to improve performance.

CE223 Transportation Policy Analysis (3) F of odd years. Transportation policy process and outputs at national, state, local levels. Major government institutions and interest groups, nature of decision-making system, transportation system development as function of policy evolution. Key policy issues in urban transportation.

CE224A Transportation Survey Methods (3) F of odd years. Data collection methods and principally survey sampling techniques for transportation planning and engineering. Survey planning, design, and administration. Sampling procedures, sample error and bias, survey instrument design. Case study examples. Prerequisites: knowledge of basic probability and statistics; graduate standing or consent of instructor.

CE224B Transportation Data Analysis (3) F of even years. Statistical analysis of transportation data sources. Least squares and maxi-

mum likelihood estimation techniques. Advanced multivariate analysis methods such as clustering techniques, canonical correlation, and analysis of covariance structures. Use of appropriate statistical model packages. Prerequisite: knowledge of basic probability and statistics; graduate standing or consent of instructor.

CE225 Transportation and Urban Systems Analysis (3) F of odd years. Analytical techniques for the study of interactions between transportation systems design and the spatial distribution of urban activities. Development of models of demographic and economic activity, land use, and facility location. Forecasting exogenous inputs to existing transportation models. Prerequisite: introductory systems analysis.

CE226A Traffic Systems Theory (3) F of even years. Measurement and statistical representation of traffic characteristics. Speed-flow-concentration models and relationships to levels of service and highway capacity. Human elements. Car following and shock wave analysis. Application of queuing theory to traffic events; traffic flow simulation. Prerequisite: graduate standing or consent of instructor; knowledge of basic probability and statistics.

CE226B Traffic Systems Operations and Management (3) W of odd years. Operational analysis, planning, and management of arterial traffic systems. Application of traffic operations computer simulation models to single intersections and arterial traffic systems. Design of coordinated traffic signal control systems. Prerequisites: CE226A or CE127.

CE226C Freeway Operations and Analysis (3) S of odd years. Operational planning, analysis, and management of freeway traffic systems. Review of geometric design, flow models, and capacity analysis. Freeway operations: bottle necks, control systems, demand management policies. Freeway operation and analysis models; simulation and optimization. Prerequisites: CE226A or CE127.

CE227 Urban Operations Research (3) W of even years. Introduction to mathematical methods and models required to address logistically oriented urban development problems, such as bus and paratransit services, emergency services, and route selection. Techniques include geometrical probability, queuing theory, network theory, and simulation. Prerequisite: CE221.

CE228 Urban Transportation Networks (3) S of even years. Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE), comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems.

CE231 Foundation Engineering (3) W of even years. Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footings, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations. Prerequisite: CE131 or equivalent.

CE232 Soil Dynamics (3) S of even years. Wave propagation. Soil properties for dynamic loads. Effects of earthquakes on retaining walls, dams, and embankments. Dynamic behavior of footings and pile foundations. Liquefaction of soils. Machine foundations. Prerequisites: CE131, CE247.

CE242 Continuum Mechanics (3) F. Deformation, displacement, vector, strain tensor. Compatibility. Velocity accelerations; strain-rate tensor. Stress tensor. Conservation of mass and energy, virtual work. Linear elasticity, fluid flow. Applications.

CE244 Wind Engineering (3) S of odd years. Essentials for the determination of extreme wind loads on structures. Topics include basic characteristics of wind, engineering aspects of wind, wind loads on structures, wind hazard probabilities, and dynamic effects of wind. Prerequisites: CE105, CE247, or equivalents.

CE245 Experimental Modal Analysis (3) S. A thorough coverage of modal analysis techniques including digital signal processing concepts, structural dynamics theory, modal parameter estimation techniques, and application of modal measurement methods suitable for practical vibration analysis problems. Prerequisite: CE247 or equivalent.

CE247 Structural Dynamics (3) F. Vibration of discrete and continuous mass elastic systems. Isolation and transmissibility. Dynamic recording instruments. Introduction to nonlinear theory of vibration. Response of structures to earthquake, traffic, and wind loads. Response spectra concepts. Normal mode analysis. Numerical integration techniques. Prerequisite: Engineering E80.

CE248 Random Vibrations (3) W of odd years. Stochastic response of linear, single, and multidegree of freedom systems. Probabilistic approach to dynamic response of structures to random loading such as earthquake and wind gusting. Prerequisite: consent of instructor.

CE249 Earthquake Engineering (3) W. Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings. Seismic response of special structures. Lifeline engineering. Prerequisite: consent of instructor.

CE250 Computational Methods in Structural Mechanics (3) S. Weighted residual methods and boundary integral equations, boundary element method, applications in potential and elasticity problems, nonlinear and time-dependent problems, critical evaluation of finite and boundary elements. Prerequisite: CE281.

CE251 Dynamics of Fluid/Structures Systems (3) W of odd years. Fundamentals of structural dynamics (time and frequency domains), fluid mechanics (potential flow and hydrodynamic forces), and numerical methods (finite elements and boundary solutions). Formulation of the general interaction problem with applications to ground-based and elevated tanks, dams, and off-shore structures. Prerequisite: consent of instructor.

CE253 Plates and Shells (3) S of odd years. Plates and shells as structural members, using classical differential equations and modern computer techniques. Topics include bending of circular and rectangular plates, shells of revolution, and cylindrical shells. Finite element computer practice. Prerequisite: consent of instructor.

CE257 Advanced Structural Analysis (3) W. Flexibility and stiffness methods in the analysis of indeterminate structures. Computer-based techniques. Modeling of structural elements to simulate inelastic behavior. Static and dynamic analyses for lateral loading conditions. Prerequisite: consent of instructor.

CE258 Earthquake-Resistant Structural Design (3) S. Objectives of seismic design. Cyclic load-distortion characteristics of typical structural elements. Desirable structural form. Ductility and methods of achieving it. Use of energy dissipators. Project involving design of multistory, multibay rigid-jointed plane frame. Prerequisite: consent of instructor.

CE259 Structural Stability (3) S of even years. Introduction to structural stability emphasizing behavior of simple structural components that illustrate various modes of instability: Euler columns, beam columns, beam torsional and lateral instability, circular ring buckling. Elementary matrix methods compatible with the finite element models now used in industry for complex structures. Prerequisite: consent of instructor.

CE264 Chemical Equilibria in Natural Waters (3) W. Fundamentals of chemical equilibria applied to aqueous systems. Numerical and computer equilibrium models for acid-base reactions, metal complexation, multi-phase systems, and redox reactions. Other topics include carbonate equilibria, alkalinity, sediment environments, eutrophication, and acid precipitation. Prerequisite: CE164 or consent of instructor.

CE266 Aqueous Geochemistry (3) S. Principles of mineral surface chemistry in aqueous systems. Topics include adsorption, surface charge theories, colloid stability, and computer equilibrium models. Soil mineralogy fundamentals. Geochemical processes, including mineral weathering, elemental cycles, salinization, and groundwater contaminant transport factors. Prerequisite: CE264 or consent of instructor.

CE271 Unsaturated Flow in Soils (3) W of odd years. Theory and application of flow of fluid in the unsaturated zone (zone of aeration). Topics in soil-water physics, analysis of flows in regional groundwater basins, miscible displacement, mathematical modeling techniques. Prerequisite: consent of instructor.

CE272 Fluid Flow in Porous Media (3) F. Theory and application of dynamics of flow in porous media. Groundwater resources, evaluation and management. Well design and analysis. Dispersion of pollu-

nants. Mathematical models. Prerequisite: CE170 or consent of instructor.

CE273 Water and Waste Treatment Technology (3) S. With laboratory. Water and waste pollution control. Physical, chemical, and biological treatment. Reuse of wastes and disposal of nonreusable wastes. Prerequisite: CE173.

CE274 Transport Phenomena in Porous Media (3) W of odd years. Fundamentals of transport in porous media, including mass, momentum, energy, and species transport. Development of macroscopic continuum equations from microscopic variables. Mathematical models at the macroscopic scale. Applications include single phase flow, solute transport, heat transport, multiphase flow, aquifer problems.

CE275 Numerical Methods in Subsurface Hydrology (3) S of even years. Numerical solutions of problems in subsurface hydrology. Finite difference, finite element, and other methods are applied to elliptic, parabolic, and hyperbolic partial differential equations arising from porous media phenomena. Well hydraulics, regional groundwater flow, flow in unsaturated soils, solute transport, multiphase flow. Prerequisites: CE271 or CE272, CE280, CE281, or consent of instructor; computer programming required.

CE276 Stochastic Geohydrology (1) S. Sources of uncertainty in modeling subsurface hydrology. Techniques for quantifying and reducing effects of uncertainty. Monte Carlo, spectral, perturbation, and moment methods. Kriging as best linear unbiased estimator. Turning bands and other random field generators. Some programming required. Prerequisites: CE272, CE283, consent of instructor.

CE278 Flow in Open Channels (3) F of even years. Mechanics of fluid motion in open channels, uniform and nonuniform flow, unsteady flow, flood routing, flow over movable beds, and sediment and mass transport. Numerical methods. Prerequisite: CE170 or consent of instructor.

CE280 Computational Methods and Software (3) F. Numerical methods and software for engineering and science. Emphasis on problem solving. Use of libraries and high-quality software. FORTRAN used extensively. Errors, linear systems of equations, interpolation, quadrature, nonlinear equations, ODEs, simulation. Prerequisite: consent of instructor.

CE281 Finite Element Method in Continuum Mechanics (3) W. Application of finite elements to continuum mechanics problems. Adaptation of finite element methods to the computer. Coded algorithms provided. Variational principle and Galerkin-based schemes. Element properties and matrix manipulations. Prerequisite: FORTRAN IV programming experience.

CE282 Reliability of Engineering Systems (3) W. Develops the basic concepts for the definition and assessment of safety and reliability of engineering systems. Includes probabilistic modeling of engineering problems, assessment of component reliability, systems reliability, and introduction to probability-based design. Prerequisite: CE105 or consent of instructor.

CE283 Mathematical Methods in Engineering Analysis (3) F. Tensors and matrices; eigenvalue problems; partial differential equations; boundary value problems; special functions; introduction to complex variables; calculus of variations and its applications.

CE295 Seminars in Engineering (varies) F, W, S. Seminars scheduled each year by individual faculty in major field of interest. Prerequisite: consent of instructor. May be repeated for credit.

CE296 Master of Science Thesis Research (varies) F, W, S. Individual research or investigation conducted in preparation of the thesis required for the M.S. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

CE297 Doctor of Philosophy Dissertation Research (varies) F, W, S. Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

CE298 Special Topics in Civil Engineering (varies) F, W, S. Presentation of advanced topics and special research areas in civil engineering. Prerequisite: graduate standing or consent of instructor.

CE299 Individual Research (varies) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor.

Department of Electrical Engineering Faculty

- Jose B. Cruz, Jr., Ph.D. University of Illinois, Urbana-Champaign, *Department Chair and Professor of Electrical Engineering* (control of large-scale systems, decision strategies in large-scale systems, dynamic control of manufacturing systems)
- Nader Bagherzadeh, Ph.D. University of Texas at Austin, *Assistant Professor of Electrical Engineering* (parallel processing; distributed computing; computer architecture; neural networks)
- Casper W. Barnes, Jr., Ph.D. Stanford University, *Professor of Electrical Engineering* (signal processing, digital filtering)
- Harut Barsamian, M.S.E.E. Polytechnic Institute of Yerevan, Armenia S.S.R., *Adjunct Professor of Electrical Engineering and Information and Computer Science* (high-speed computer architecture; special purpose architectures; software engineering; VLSI structures; fault-tolerant systems; parallel architectures)
- Behnam Bavarian, Ph.D. Ohio State University, *Assistant Professor of Electrical Engineering* (control systems, robotics)
- Neil J. Bershad, Ph.D. Rensselaer Polytechnic Institute, *Professor of Electrical Engineering* (communication and information theory, signal processing)
- Lubomir Bic, Ph.D. University of California, Irvine, *Associate Professor of Information and Computer Science and Electrical Engineering* (systems based on the principles of dataflow; architectures and languages for such systems; dataflow principles for database applications)
- Douglas M. Blough, Ph.D. The John Hopkins University, *Assistant Professor of Electrical Engineering* (parallel architectures, distributed algorithms, fault-tolerant computing, computer networks)
- Thomas N. Cornsweet, Ph.D. Brown University, *Professor of Cognitive Sciences, Ophthalmology and Electrical Engineering* (human vision, robotic vision, and electrooptical instrumentation)
- Leonard Ferrari, Ph.D. University of California, Irvine, *Associate Professor of Electrical Engineering and Radiological Sciences* (image engineering and computer engineering)
- Daniel D. Gajski, Ph.D. University of Pennsylvania, *Professor of Information and Computer Science and Electrical Engineering* (parallel algorithms and architectures; silicon compilation; expert systems for design; science of design)
- Hideya Gamo, D.Sc. University of Tokyo, *Professor of Electrical Engineering* (quantum electronics and modern optics)
- K. H. (Kane) Kim, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering* (distributed real-time computer systems, fault-tolerant computer systems, real-time learning systems)
- Fadi Kurdahi, Ph.D. University of Southern California, *Assistant Professor of Electrical Engineering* (VLSI structures; design automation of digital circuits)
- Chin C. Lee, Ph.D. Carnegie-Mellon University, *Assistant Professor of Electrical Engineering* (solid state technology and devices, integrated and fiber optics, optoelectronics, acoustic microscopy)
- Gyann Pyng Li, Ph.D. University of California, Los Angeles, *Assistant Professor of Electrical Engineering* (high-speed semiconductor technology, optoelectronic devices, integrated circuit fabrication)
- James H. Mulligan, Jr., Ph.D. Columbia University, *Professor of Electrical Engineering* (solid state circuits, active networks, system theory), Registered Professional Engineer
- Orhan Nalcioglu, Ph.D. University of Oregon, *Professor of Radiological Sciences and Electrical Engineering* (nuclear magnetic resonance imaging, digital radiography, computer tomography, and medical imaging)
- Nohbyung Park, Ph.D. University of Southern California, *Assistant Professor of Electrical Engineering* (high-speed/VLSI system design, design automation of digital systems, computer architecture, logic design and switching theory, microprocessor applications)
- Robert M. Saunders, D.Eng. Tokyo Institute of Technology, *Professor Emeritus of Electrical Engineering* (energy conversion and electromechanical devices, control systems), Registered Professional Engineer
- Roland Schinzinger, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Administration* (electric power systems, operations research, optimal design), Registered Professional Engineer

Jack Sklansky, D.Sc. Columbia University, *Professor of Electrical Engineering, Information and Computer Science, and Radiological Sciences* (pattern recognition, image processing, computer engineering), Registered Professional Engineer

Gregory J. Sonek, Ph.D. Cornell University, *Assistant Professor of Electrical Engineering* (semiconductor integrated optics and optoelectronics; semiconductor materials characterization)

Allen R. Stubberud, Ph.D. University of California, Los Angeles, *Professor of Electrical Engineering* (control systems, estimation and optimization, digital filtering), Registered Professional Engineer

Harry H. Tan, Ph.D. University of California, Los Angeles, *Associate Professor of Electrical Engineering* (communication and information theory, stochastic processes)

Chen S. Tsai, Ph.D. Stanford University, *Professor of Electrical Engineering* (integrated and fiber optics, acoustic microscopy, electro-optics, solid state devices)

Audrey M. Viterbi, Ph.D. University of California, Berkeley, *Assistant Professor of Electrical Engineering* (communication networks and communication theory)

Stanley A. White, Ph.D. Purdue University, *Adjunct Professor of Electrical Engineering* (signal processing)

Lecturers

Benjamin Fisher, Ph.D. University of California, Irvine, *Lecturer in Electrical Engineering* (communication theory)

Charles C. Huang, Ph.D. University of Minnesota, *Lecturer in Electrical Engineering* (CMOS)

David Isaacs, Ph.D. University of California, Los Angeles, *Lecturer in Electrical Engineering* (system theory)

Mohamed Kebaili, Ph.D. University of California, Irvine, *Lecturer in Electrical Engineering* (integrated optics, robotics and control systems, microprocessors, and microcomputers)

Gee L. Lui, Ph.D. University of California, Irvine, *Lecturer in Electrical Engineering* (linear systems, digital signal processing)

Iqbal M. Naqvi, Ph.D. Cornell University, *Lecturer in Electrical Engineering* (electronic design)

Mohamed Santana, Ph.D. University of California, Irvine, *Lecturer in Electrical Engineering* (controls, electronics, and signal processing)

Douglas T. Sherwood, Ph.D. University of California, Irvine, *Lecturer in Electrical Engineering* (networks and signal processing)

Kenneth Tiernan, Ph.D. Tufts University, *Lecturer in Electrical Engineering* (circuits and systems)

Kevin V. Tracy, M.S. Georgia Institute of Technology, *Lecturer in Electrical Engineering* (signal processing and communications)

Lawrence R. Weill, Ph.D. University of Idaho, *Lecturer in Electrical Engineering* (information theory and communication systems)

Electrical engineering is a broad field encompassing such diverse subject areas as computers, control, electronics, digital systems, communications, signal processing, electromagnetics, and physics of electronic devices. Knowledge of the mathematical and natural sciences is applied to the theory, design, and implementation of devices and systems for the benefit of society.

Some electrical engineers focus on the study of behavior of electronic devices and circuits that are the basic building blocks of complex electronic systems. Others study the generation, transmission, and utilization of electrical energy. A large group of electrical engineers studies the behavior of complex electronic systems such as computers, automatic controls, telecommunications, and signal processing. Still another group studies the application of these complex systems to other areas, including medicine, biology, geology, and ecology. Of this latter group, those engaged in designing a variety of electronic computers and computer-based application systems are often called computer engineers.

Most electrical engineers begin work in a large organizational environment as members of an engineering team. They obtain career satisfaction from solving meaningful problems that contribute to the success of the organization's overall goal. As they mature, electrical engineers have the opportunity to grow technically, administratively, or both. Technical growth most naturally results from the acquisition of an advanced degree and further development of the basic thought processes instilled in the undergraduate years. Administrative growth can result from the development of management skills on the job and/or through advanced degree programs in management. In either case, a B.S. degree in Electrical Engineering provides a solid foundation for future career growth.

Research in Image Engineering

Spanning the growing industrial-scientific spectrum of technologies which utilize visual images, image engineering synthesizes current research in a comprehensive way that may have far-reaching effects on fields such as manufacturing, fluid mechanics, structural vibrations, chemistry, cardiology, and radiology. This new concept in engineering could impact a range of industries from radar to pharmaceuticals, from medical imaging to computer-aided manufacturing, from vehicular guidance and inspection to electronic cameras. Participants include engineering firms and several academic disciplines at UCI. Further information is available from Professor Jack Sklansky, Director, Image Engineering Research, Department of Electrical Engineering, School of Engineering, University of California, Irvine; Irvine, CA 92717.

Undergraduate Option in Electrical Engineering

Bachelor of Science Degree

The undergraduate Electrical Engineering curriculum is built around a basic core of humanities, mathematics, natural and engineering science courses. It is arranged to provide the fundamentals of synthesis and design that will enable graduates to begin careers in industry or to go on to graduate study. Electrical engineering students at UCI are exposed to courses in network analysis, electronic system design, signal processing, control systems, electromagnetics, and computers. They learn to design circuits and systems to meet specific needs and to use modern computers in problem analysis and solution.

A major program emphasis within the Department is computer engineering, a discipline primarily concerned with design and analysis of computer systems. Students can take a program of study leading to strong proficiency in computer engineering, in particular, the design and analysis of microprocessor-based systems. In addition to the courses offered by the Department, this program includes selected courses from the Department of Information and Computer Science.

The electrical engineering faculty have special interest and expertise in the following fields: communications theory; computer systems; control systems; digital signal processing; system design; integrated electro-optics and acoustics; medical imaging and automatic pattern classification; power systems and electromechanics; and quantum electronics and optics.

Requirements for the Bachelor's Degree with the Electrical Engineering Option¹

University Requirements: See pages 52-55.

School Requirements: See page 276.

Departmental Requirements: At least 94 units consisting of:

A. Seventy units of core courses and associated laboratories: Physics 5D and 5LD, Physics 5E and 5LE, Engineering EE11A, EE11B, EE31 and EE31L, EE70, EE75 and EE75L, EE110A and EE110LA, EE110B and EE110LB, EE113, EE120A, EE120B, EE140A and EE140LA, EE170, EE180, and EE186.

B. Eighteen units of technical electives and associated laboratories which may be selected from science or engineering fields. Students wishing to take courses outside of the Department of Electrical Engineering must receive written permission from their faculty advisor.

C. Six units of free electives.

Students should select their electives so that they aggregate a minimum of 23 design units. At least one of the Engineering courses taken to satisfy the graduation requirement should have more than 50 percent design content. The design unit value is listed at the end of the course description.

Program of Study

Students must complete all required freshman and sophomore courses before they enroll in any junior or senior electrical engineering courses.

Sample Program of Study—Electrical Engineering¹

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Chemistry 1A, 1LAE Free Elective ² Breadth	Math 3B Physics 5C, 5LC Free Elective ² EE31, 31L	E101 EE113 EE180 Breadth	EE140A, 140LA Technical Elective Free Elective ² Breadth
Winter	Math 2B Physics 5A EE11A Breadth	Math 3A Physics 5D, 5LD Free or Technical Elective ² EE70 ³	EE170 EE110A, 110LA EE120A Breadth	Technical Elective Technical Elective Free Elective ² Breadth
Spring	Math 2C Physics 5B, 5LB EE11B Breadth	Math 3D Physics 5E, 5LE EE75, 75L ⁴ E80	EE186 EE110B, 110LB EE120B Breadth	Technical Elective Free Elective ² Free Elective ² Breadth

¹Sample program charts for students who began prior to fall 1989 are available in the Electrical Engineering Office and in the Undergraduate Student Affairs Office.

²Students should see their Academic Counselor.

³Beginning 1990-91, this course will be offered during the winter and summer quarters.

⁴Beginning 1990-91, these courses will be offered during the spring and summer quarters.

The sample program of study chart is typical for the accredited option in Electrical Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by the appropriate advisor.

Graduate Concentration in Electrical Engineering

Because most graduate courses are not repeated every quarter, students should make every effort to begin their graduate program in the fall.

Master of Science Degree

The Electrical Engineering Department offers two routes to the M.S. degree: a comprehensive examination option and a thesis option.

The comprehensive examination option is a nonthesis program. Candidates take the five Electrical Engineering core courses (EE210A, EE235, EE240A, EE279, and EE287A) and a coherent set of courses in a specialization approved by their faculty advisor. In addition to the University's grade-point-average requirements, each of the core courses must be completed with a grade of B or better.

The thesis option is available for those graduate students who might best benefit from intense concentration on a specific problem. For the thesis option, students (during the first quarter of the program and in consultation with their faculty advisor) are required to develop and obtain approval of a complete program of study. A committee of three full-time faculty members is appointed to guide development of the thesis and, when the thesis is approved, to administer an oral examination on basic principles and the thesis contents. It is possible to meet either degree requirement on a part-time basis.

All M.S. students are required to enroll in the weekly departmental seminar, EE294, for at least two quarters.

Doctor of Philosophy Degree

The Ph.D. program in Electrical Engineering requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. After substantial preparation, Ph.D. candidates work as understudies to faculty advisors. The process involves extended immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation.

All Ph.D. students are required to enroll in the weekly departmental seminar, EE294, for at least four quarters.

Milestones to be passed in the Ph.D. program include the following: acceptance into a research group by the faculty advisor during the student's first quarter of study; successful completion of the Ph.D. preliminary examination; preparation for doing research, completion of the School of Engineering teaching requirements, and the development of a research proposal; passing the Qualifying Examination which assesses the candidate's preparation for research and evaluates the proposed research; successful completion of the

research; development and approval of the dissertation; presentation of the dissertation and final examination on its contents.

The Ph.D. preliminary examination contains two parts: a depth examination administered at the end of the first year of doctoral study by faculty in the student's area of specialization; and, preceding it, a breadth examination consisting of the General Record Examination Subject Tests in either Physics, Mathematics, or Computer Science. The results of the Subject Test must be made available to the faculty prior to the end of the winter quarter of the student's first year of study in the doctoral program. The Ph.D. preliminary examination may be repeated once.

The degree is granted upon the recommendation of the doctoral committee and the School's Associate Dean of Graduate Studies. Doctoral programs must be completed within seven calendar years of the date of admission.

Electrical Engineering Undergraduate Courses

EE11A Computational Methods in Electrical Engineering I (4) W.

An introduction to computers and structured programming. Fundamentals of computer systems, operating systems, utility programs. In-depth study of a high-level programming language (currently PASCAL) through hands-on programming. Introduction to algorithm efficiency. Prerequisite: Mathematics 2A. (Design units: 0)

EE11B Computational Methods in Electrical Engineering II (4) S.

Structured programming techniques and their engineering applications. Analysis, design, and implementation of symbolic and numeric algorithms. Introduction to engineering software packages. Prerequisite: EE11A. (Design units: 0)

EE31 Introduction to Boolean Algebra and Digital Logic (4) F.

Binary systems: numbering and logic. Boolean algebra and simplification of boolean functions. Introduction to combinational logic: design procedure and analysis. Introduction to synchronous sequential logic: flip-flops, state representation and design procedure. Concurrent enrollment in EE31L is required. Corequisite: EE31L. Prerequisite: Sophomore standing. Not offered 1989-90. (Design units: 2)

EE31L Introductory Digital Logic Laboratory (1) F. Laboratory to accompany EE31. Corequisite: EE31. Not offered 1989-90. (Design units: 1)

EE70 Network Analysis I (3) F, Summer. Modeling and analysis of electrical networks. Frequency and transient response of circuits. Prerequisites: Mathematics 2C, Physics 5B, Engineering EE11B. Formerly Engineering E70. (Design units: 0)

EE72 Electronics and Power Systems (3) S. Introductory concepts in electronics and power systems for majors in Mechanical Engineering. Circuits, network analysis, electrical power systems. Prerequisites: Mathematics 2C; Physics 5B; Engineering EE11B. (Design units: 0)

EE75 Network Analysis II (4) W, Summer. Application of Laplace transforms; poles and zeros; two port parameters; Bode plots; Fourier series and Fourier transforms. Concurrent enrollment in EE75L is required. Prerequisites: EE11B and EE70. (Design units: 0)

EE75L Electric Networks Laboratory (1) W, Summer. Laboratory to accompany EE75. Concurrent enrollment in EE75 is required. Prerequisites: EE11B and EE70. (Design units: 0)

EE110A Electronics I (4) W. Principles of operation and circuit models for junction diodes and bipolar and field effect transistors. Application of these models to the design of discrete and integrated electronic circuits for amplification, rectification, and signal generation. Concurrent enrollment in EE110LA is required. Prerequisites: EE75, 75L, and 113. (Design units: 2)

EE110LA Electronics I Laboratory (1) W. Laboratory accompanying EE110A. Concurrent enrollment in EE110A is required. (Design units: 1)

EE110B Electronics II (4) S. With laboratory. The principles of operation, design, and utilization of integrated circuit modules, including operational amplifiers, logic circuits, and pulse circuits. Typical applications to electronic system design. Concurrent enrollment in EE110LB is required. Prerequisites: EE110A, EE110LA. (Design units: 2)

EE110LB Electronics II Laboratory (1) S. Laboratory accompanying EE110B. Concurrent enrollment in EE110B is required. (Design units: 1)

EE111A Analysis and Design of Electrical Circuits (4) S. Active and passive electrical circuits. Topology, network theorems, sensitivity considerations. Classical synthesis and computer-aided techniques for two-, three-, and four-terminal networks. Prerequisites: EE110B, EE110LB, and EE120B. (Design units: 2)

EE113 Physical Electronics and Materials (4) F, Summer. Processes of electronic conduction in solids. Principles and properties of semiconductors, diodes, and transistors. Magnetic materials and superconductors. Prerequisites: EE70, Physics 5D. May not be offered every summer. (Design units: 0)

EE114A Field-Effect Semiconductor Devices (4) F. Semiconductor theory, metal-semiconductor contacts and diodes, metal-oxide-semiconductor (MOS) structures; MOS field-effect transistors, junction field-effect transistors, device modeling and fabrication technologies. Prerequisite: EE113. (Design units: 1)

EE114B Bipolar Semiconductor Devices (4) W. PN-junction diodes, bipolar (NPN or PNP) transistors, photodiodes, light-emitting diodes, laser diodes, device modeling, and fabrication technologies. Prerequisite: EE114A. (Design units: 1)

EE115A Integrated Electronic Circuit Design (4) S. Specialized analysis and design techniques associated with the design of LSI and VLSI electronic circuits. Current approaches to computer-aided design and fabrication. Prerequisites: EE110A, EE110B, EE131, and consent of instructor. (Design units: 4)

EE120A Signals and Systems I (4) W, Summer. Studies of signals and systems. Application of Fourier series and Fourier and Laplace transforms to continuous-time system analysis. Convolution and modulation theory. Prerequisites: EE75, EE180. Not offered every summer. (Design units: 0)

EE120B Signals and Systems II (4) S. Application of sampling theorem, z-transforms, and discrete Fourier transforms to discrete-time system analysis. Difference equations, discrete-time convolution. Prerequisite: EE120A. (Design units: 0)

EE128A Communication Systems (3) S. Introduction to analog and digital communication systems, including effects of noise. Modulation-demodulation for AM, FM, PM, and PCM, with applications to radio, television, and recorders. Signal processing as applied to communication systems. Prerequisites: EE120B and EE186. (Design units: 1)

EE131 Logic and Switching Circuits (4) F. Introduction to digital computers. Numbers and codes, Boolean algebra, switching circuits, sequential networks, hardware forms, analysis and design problems. Concurrent enrollment in EE131L is required. Prerequisites: EE110B, EE110LB. Note that EE131 and Information and Computer Science 151A may not both be taken for credit. (Design units: 2)

EE131L Logic and Switching Circuits Laboratory (1) F. Laboratory to accompany EE131. Corequisite: concurrent enrollment in EE131. (Design units: 1)

EE132 Logic and Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/output devices and interfaces. Microprogramming and microprocessors. Concurrent enrollment in EE132L is required. Prerequisites: EE131, EE131L. Note that EE132 and Information and Computer Science 151B may not both be taken for credit. (Design units: 1)

EE132L Digital Computer Laboratory (1) W. Laboratory to accompany EE132. Corequisite: concurrent enrollment in EE132. (Design units: 1)

EE133 Microprocessors (3) S. Covers microprocessor architectures and peripheral devices. Experience with a microprocessor system is

provided. Functional requirements are realized through software and I/O hardware design. Prerequisites: EE132 and EE132L. (Design units: 3)

EE133L Microprocessor Laboratory (1) S. Laboratory to accompany EE133. Corequisite: concurrent enrollment in EE133. (Design units: 1)

EE134 Fundamentals of System Software (4) W. Basic concepts of data structures and system programming techniques including loaders, linkers, assembler and file manipulations. Principles of design with assembly languages and high-level languages, e.g., C, PASCAL. Concepts are demonstrated for searching, sorting, algebraic calculations, and I/O operations. Corequisite: EE134L. Prerequisite: EE132. (Design units: 1)

EE134L Systems Software Laboratory (1) W. Software design and programming work with assembly language and high-level languages (C or PASCAL), including main phases of system software development. Corequisite: EE134. (Design units: 1)

EE135 Digital Signal Processing (3) F. Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, fast Fourier transform, w-transform, digital filters, Butterworth and Chebyshev filters, quantization effects. Prerequisites: EE120B and EE186. (Design units: 1)

EE136 Computer Vision (3) S. The use of digital computers for the analysis of visual scenes; image enhancement in digital displays; geometric corrections; pattern recognition; robotics; diagnosis of medical images. Prerequisites: EE120B or consent of instructor. (Design units: 2)

EE140A Introduction to Control Systems (4) F. Feedback control systems. Modeling, stability, and system specifications. Root locus, Bode, Nichols, and state-space methods of analysis and design. Corequisite: concurrent enrollment in EE140LA. Prerequisites: Engineering E80, EE11B; EE110B, EE110LB, EE120B. (Design units: 3)

EE140LA Control Systems I Laboratory (1) F. Laboratory accompanying EE140A. Corequisite: concurrent enrollment in EE140A. (Design units: 1)

EE140B Sampled-Data and Digital Control Systems (3) W. Sampled-data and digital control systems. Sampling process and theory of digital signals; z-transform and modeling; stability; z-plane, frequency response, state-space techniques of digital control system synthesis. Prerequisites: EE131, EE131L, EE140A, EE140LA. (Design units: 2)

EE160 Energy Conversion (4) W. Magnetic circuits and transformers. Fundamentals of energy conversion. Application to synchronous, induction, commutator, and special purpose machines such as robotic actuators and computer disk drives. Corequisite: EE160L. Prerequisite: EE75. (Design units: 2)

EE160L Energy Conversion Laboratory (1) W. Laboratory for EE160. Corequisite: EE160. Prerequisite: EE110LA. (Design units: 0)

EE163 Electric Power Systems (4) F. Generation, transmission, and use of electrical energy. Fault calculation, protection, stability, and power flow. Corequisite: EE163L. Prerequisite: EE75. (Design units: 1)

EE163L Electric Power Systems Laboratory (1) F. Experiments and field trips relevant to studies in power systems. Corequisite: EE163. Prerequisite: EE110LA. (Design units: 0)

EE170 Engineering Electromagnetics (4) W. Electromagnetic fields and solutions of problems in engineering applications; reflection and refraction of plane waves, transmission line and guided waves, resonance cavity and radiation. Prerequisites: EE113, Mathematics 3D. (Design units: 0)

EE176 Engineering Optics (3) F. Fundamentals of optical systems design: incoherent light sources, lens, mirror, photodetectors, radiometry, image recording and display. Optical systems and components; resolution, modulation, transfer functions, and noise. Corequisite: EE176L. Prerequisite: EE170. (Design units: 1)

EE176L Engineering Optics Laboratory (1) F. Basic optics and laser experiments. Lens, prism, grating, diffraction, interferences, He-Ne and CO₂ gas lasers. Corequisite: EE176. (Design units: 0)

EE177 Engineering Electrodynamics (3) S. Time-varying electromagnetic fields including waveguides, resonant cavities, radiating systems. Motion of charged particles in electromagnetic fields, radiation by moving charges. Scattering and dispersion. Corequisite: EE177L. Prerequisite: EE170. (Design units: 1)

EE177L Engineering Electrodynamics Laboratory (1) S. Transmission line, waveguides, antenna microwave oscillators, and detectors. Corequisite: EE177. (Design units: 0)

EE178 Optical Electronics (3) W. Fundamentals of optical systems and components. Incoherent light sources, radiometry, resolution and transfer functions. Lasers and related optical devices and systems. Corequisite: EE178L. Prerequisite: consent of instructor. (Design units: 1)

EE178L Optical Electronics Laboratory (1) W. Optical guided waves, electro-optical modulator, acousto-optical modulator, dye and semiconductor lasers. Corequisite: EE178. (Design units: 0)

EE180 Electrical Engineering Analysis (3) F. Functions of complex numbers and their application to electrical engineering problems. Applications to lumped and continuous parameter engineering systems. Prerequisites: EE75, Mathematics 3D. (Design units: 0)

EE181A-B-C Mathematical Methods in Operations Research. Operations research forms the basis for rational decision making in the design and operation of complex (engineering) systems. Prerequisite: consent of instructor. Same as Mathematics 171A-B-C.

EE181A Linear Programming (4) F. Simplex algorithm, duality, optimization in networks. (Design units: 2)

EE181B Nonlinear Programming (4) W. Conditions for optimality; quadratic and convex programming, geometric programming, search methods. (Design units: 2)

EE181C Integer and Dynamic Programming (4) S. Multistage decision models. Applications. (Design units: 2)

EE186 Engineering Probability (4) S. Sets and set operations; nature of probability, sample spaces, fields of events, probability measures; conditional probability, independence, random variables, distribution functions, density functions, conditional distributions and densities; moments, characteristic functions, random sequences, independent and Markov sequences. Corequisite: concurrent enrollment in EE120B. Prerequisite: EE120A. (Design units: 0)

EE198 Group Study (1 to 4) F, W, S. Group study of selected topics in engineering. (Design units: varies)

EE198L Group Laboratory (1 to 4) F, W, S. Group laboratory for experimentation or design in connection with special projects or EE198 courses. May be repeated for credit. (Design units: varies)

EE199 Individual Study (1 to 4) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Prerequisite: consent of instructor. (Design units: varies)

Electrical Engineering Graduate Courses

EE210A Active Networks I (3) F. Behavior of active networks subjected to analog and digital signals. Application to the analysis and optimum design of common electronic circuits used for processing analog and digital signals. Prerequisites: EE110A-B or equivalent.

EE210B Active Networks II (3) W. Analysis and optimum design of integrated electronic circuits and systems to process analog and digital signals. Performance limitations of bipolar and field effect integrated circuits, charge coupled devices; development of design methods for their effective utilization in analog, digital, and hybrid systems. Prerequisite: EE210A or consent of instructor.

EE212 Topics in Electronic System Design (3). New research results in electronic system design. Prerequisite: consent of instructor. May be repeated for credit.

EE217A Advanced Semiconductor Devices I (3) W. Semiconductor theory, GaAs metal-semiconductor field-effect transistors (MESFET), microwave semiconductor devices, analog, and digital MESFET integrated circuits, device modeling and fabrication technologies. Prerequisite: EE114A.

EE217B Advanced Semiconductor Devices II (3) S. Photodiodes, light-emitting diodes, diode lasers, epitaxial growth of III-V compound semiconductors, and fiber optics technology. Prerequisite: EE114A.

EE222 Topics in Communications Systems (3). New research results in communications systems. Prerequisite: consent of instructor. May be repeated for credit.

EE227A-B Detection, Estimation, and Demodulation Theory (3-3) W, S. Application of statistical design theory, state variables, random processes, and Ito calculus to deriving optimum receiver structures for signal detection, parameter estimation, and analog demodulation. Prerequisite: EE287A.

EE228A-B Communication and Information Theory (3-3) W, S. Communication over noisy channels; optimum receiver design; information theory concepts entropy, mutual information, encoding of information. Shannon's coding theorems, channel capacity, and implementation of some coded systems. Prerequisite: EE287A or consent of instructor.

EE229A Queuing Theory (3) F. Elementary queuing models; conservation laws; work. Markovian queues; product form results; embedded Markov chains. Fluctuation theory and GI/G/I queues. Approximation and bounds. Priority queuing. Prerequisite: EE287A.

EE229B Communication Networks (3) W. Review of elementary queuing models; Markov chains; passage times; approximations. Queuing models for networks; routing capacity assignment, flow control, priority, numerical methods. Models of local area networks, cellular radio networks, satellite networks. Analysis of multiple access schemes. Prerequisite: EE229A.

EE230A Digital Signal Processing I (3) W. Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters. Prerequisites: EE135, EE240A, and EE287.

EE230B Digital Signal Processing II (3) S. Applications of digital signal processing, short-time spectral analysis, spectral estimation, optimal filtering, autoregressive modeling, waveform quantization and coding, block processing, distributed arithmetic. Prerequisite: EE230A.

EE231 Advanced System Software (3) F. Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing for multiprocessors. System software design languages and modeling analysis. Prerequisite: EE134.

EE232 Automatic Pattern Classification (3) S. Design of machines to sort observed data into classes in areas such as speech, images, electrical signals, and symptoms of disease. Topics include geometry of decisions in feature space, training procedures, feature extraction, feature selection, cluster analysis, stochastic classifiers, and nonlinear classifiers. Prerequisite: EE186.

EE233 Computer Architecture (3) S. Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology. Prerequisites: EE132, EE132L.

EE234A-B Digital Image Analysis (3-3) W, S. Manipulation and analysis of images by computer. Digitization and compression; enhancement restoration and reconstruction; matching, description, and recognition. The level of treatment emphasizes concepts, algorithms, and (when necessary) the underlying theory.

EE235 Digital Systems Theory (3) W. Discrete-state information systems. Basic mathematical tools such as groups, graphs, regular expressions, and phrase-structural languages. Discussion of applications of these tools to design of digital systems such as encoders and decoders, digital computers, and digital image analyzers. Prerequisites: EE131, EE131L.

EE236 Digital Electronics I (3) S. Band theory of solid-state electronics; semiconductor devices, fabrication technology; nonlinear circuit analysis, analog-digital and digital-analog converters, magnetic memories. Prerequisite: EE110A. Not offered 1989-90.

EE237 Medical Imaging Systems (3) W or S. The physics and engineering of imaging the structures within the human body, including x-ray projection radiography, nuclear medicine, ultrasonic imaging, positron emission imaging, magnetic resonance imaging, computed tomography, and digital subtraction angiography. Prerequisite: EE120A.

EE238 Topics in Computer Engineering (3). New research results in computer engineering. Prerequisite: consent of instructor. May be repeated for credit.

EE240A Linear Systems I (3) F. State-space representation of continuous-time and discrete-time linear systems. Controllability, observability, stability. Realization of rational transfer functions. Prerequisite: EE140A or equivalent.

EE240B Linear Systems II (3) W. Continuation of deterministic linear multivariable systems. Linear state feedback and observers in continuous-time and discrete-time system control. Introduction to stochastic systems. Prerequisite: EE240A.

EE240C Linear Systems III (3) S. Continuation of stochastic linear multivariable systems. Kalman filtering, prediction, estimation, and smoothing. Prerequisite: EE240B. Not offered 1989-90.

EE241A Advanced Topics in Control Systems I (3) F. Numerical methods in control system optimization. Prerequisite: EE240C. May be repeated for credit.

EE241B Advanced Topics in Control Systems II (3) W. State of the art in system identification. Offered when sufficient demand. Prerequisite: EE241A or consent of instructor. May be repeated for credit.

EE241C Advanced Topics in Control Systems III (3) S. Latest developments in adaptive control. Offered when sufficient demand. Prerequisite: EE240C or consent of instructor. May be repeated for credit.

EE242 Topics in Systems and Control (3). New research results in system and control theory. May be repeated for credit. Prerequisite: consent of instructor.

EE251 VLSI System Design (3) F. Overview of integrated circuit fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; behavioral simulation; logic simulation; silicon compilation; testing and fault tolerance. Prerequisites: EE115, EE132.

EE252 Distributed Computer Systems (3) F. Design and analysis techniques for decentralized computer architectures, communication protocols, and hardware-software interface. Performance and reliability considerations. Design tools. Prerequisites: EE231 and EE233.

EE260 Design and Control of Electromechanical Energy Converters (3). Advanced topics in the generalized theory of electrical machines. Design criteria and methodology, including analytical and numerical field analysis. Electronic control of generators and motors. With laboratory where appropriate. Prerequisite: EE160 or consent of instructor. May be repeated for credit with consent of instructor.

EE263 Planning and Operation of Electric Power Transmission Systems (3). Advanced topics in the planning, design, and optimal operation of electric power systems. Power flow under static and dynamic conditions. Stability. Economic dispatch. Transmission line transients. System expansion. Reliability. With laboratory where appropriate. Prerequisite: EE163 or consent of instructor. May be repeated for credit with consent of instructor.

EE270 Imaging Optics (3) S. Optical imaging instruments from geometrical and wave optic standpoints. Indirect optical imaging methods such as holography, interferometry, and intensity correlation interferometry. Not offered 1989-90.

EE271 Statistical Optics (3). Temporal and spatial coherence of electromagnetic radiation. Statistics of photoelectrons generated by thermal radiation and laser beams. Wave propagation through fluctuating medium. Signal-to-noise ratio in photodetection. Not offered 1989-90.

EE272 Engineering Quantum Mechanics (3). Basic quantum electronics for optical electronic devices. Not offered 1989-90.

EE273A Quantum Electronics I (3) W. Semiclassical development of the theory and application of lasers and related optical electronic devices. Prerequisite: EE170.

EE273B Quantum Electronics II (3) S. Quantum theoretic development of the theory and application of lasers and related optical electronic devices. Prerequisite: EE273A or consent of instructor.

EE274 Quantum Optics (3). Quantum theory of electromagnetic field and its application to laser and related optical devices. Noise, photoelectron counting statistics, and intensity correlation interferometry. Not offered 1989-90.

EE275A Electro-optic Devices (3) F. Review of basic laser principles. Optics in crystals. Electro-optic effects. Electro-optic devices and applications. Prerequisite: EE170.

EE275B Acousto-optic Devices (3) W. Bulk and surface acoustic waves, acousto-optic effects, acousto-optic Bragg diffraction, acousto-optic devices and applications. Prerequisite: EE170.

EE275C Integrated and Fiber Optics (3) S. Optical waveguides; passive and active guided-wave devices; integrated optics modules/circuits and applications; optic fibers; fiber optic devices; fiber optic communications systems; fiber optic sensors. Prerequisites: EE275A and EE275B.

EE279A Advanced Engineering Electromagnetics I (3) W. Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation. Prerequisite: EE170 or equivalent.

EE279B Advanced Engineering Electromagnetics II (3) S. Two- and three-dimensional boundary value problems, dielectric waveguides and other special waveguides, microwave networks and antenna arrays, electromagnetic properties of materials, and electromagnetic optics. Prerequisite: EE279A or equivalent.

EE281A Topics in Operations Research (3). Topic(s) selected by students and instructor. Examples: network and flows, modeling and simulation, stochastic processes. Prerequisites: EE181A-B (Math 171A-B) or Management 201B.

EE281B Optimization Methods: Theory and Applications (3). Advanced topics in linear, nonlinear, and dynamic programming and their extensions. Prerequisites: EE181A-B (Math 171A-B) or Management 201B.

EE281D Operations Management (4) S. Evaluation of risks. Operating decisions in materials handling, inventory control, service systems, scheduling, and facilities design. Discussion of qualitative and quantitative aspects. Same as Management 218.

EE287A Random Signals and Systems (3) F. Extensions of probability theory to families of random variables indexed on time. General properties of stochastic processes such as stationarity, ergodicity, stochastic continuity, differentiability, and integrability. Linear and nonlinear transformations, correlation, power spectrum, and linear filtering of stochastic processes. Linear mean-square estimation, the orthogonality principle, Wiener Kolmogoroff theory, filtering, and prediction. Wide-sense Markoff sequence, recursive filtering, and the Kalman filter. Prerequisite: EE186.

EE287B Theoretical Foundations of Stochastic Processes (3). Mathematical treatment of several advanced topics in stochastic process theory with application to modeling and analyzing communication and control systems. Enough mathematical machinery developed so that the impact and limitations of the theory can be stated precisely and understood for applications. Prerequisite: EE287A. Not offered 1989-90.

EE294 Electrical Engineering Colloquium (varies) F, W, S. Guest speakers discuss their latest research results in electrical engineering. Prerequisite: consent of instructor. May be repeated for credit.

EE295 Seminars in Engineering (varies) F, W, S. Scheduled each year by individual faculty in major field of interest. Prerequisite: consent of instructor. May be repeated for credit.

EE296 Master of Science Thesis Research (varies) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

EE297 Doctor of Philosophy Dissertation Research (varies) F, W, S. Individual research or investigation conducted in preparing and completing the dissertation required for the Ph.D. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

EE299 Individual Research (varies) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor.

Department of Mechanical Engineering

Faculty

- William E. Schmitendorf, Ph.D. Purdue University, *Department Chair, Professor of Mechanical Engineering* (control theory and applications)
- Roy M. Arrowood, Ph.D. University of California, Davis, *Assistant Professor of Mechanical Engineering* (mechanical behavior of materials, composite materials, ceramics, materials processing wear)
- Paul D. Arthur, Ph.D. California Institute of Technology, *Professor Emeritus of Mechanical Engineering* (fluid mechanics, design, heat transfer, biomedical engineering), Registered Professional Engineer
- James E. Bobrow, Ph.D. University of California, Los Angeles, *Assistant Professor of Mechanical Engineering* (dynamics, control systems, robotics and automation)
- Derek Dunn-Rankin, Ph.D. University of California, Berkeley, *Assistant Professor of Mechanical Engineering* (combustion in two-phase flows; optical methods for two-phase flow diagnostics)
- James C. Earthman, Ph.D. Stanford University, *Assistant Professor of Mechanical Engineering* (fracture, fatigue behavior and cyclic damage, defect monitoring techniques, deformation and damage at elevated temperatures)
- Donald K. Edwards, Ph.D. University of California, Berkeley, *Associate Dean, Graduate Studies and Research, School of Engineering, and Professor of Mechanical Engineering* (heat and mass transfer, radiation with convection, natural convection, evaporation, condensation), Registered Professional Engineer
- Said E. Elghobashi, Ph.D. Imperial College, University of London, *Professor of Mechanical Engineering* (combustion, heat transfer, turbulence, modeling)
- Carl A. Friehe, Ph.D. Stanford University, *Professor of Mechanical Engineering* (fluid mechanics, turbulence, atmospheric processes)
- Faryar Jabbari, Ph.D. University of California, Los Angeles, *Assistant Professor of Mechanical Engineering* (control of flexible systems, adaptive identification)
- John C. LaRue, Ph.D. University of California, San Diego, *Department Vice Chair and Associate Professor of Mechanical Engineering* (fluid mechanics, heat transfer, turbulence, combustion, instrumentation, and micrometeorology)
- Enrique J. Lavernia, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Mechanical Engineering* (rapid solidification of metals and alloys; powder metallurgy; metal matrix composites; mechanical behavior of materials; mathematical modeling)
- J. Michael McCarthy, Ph.D. Stanford University, *Associate Professor of Mechanical Engineering* (robotics, design and analysis of machines and mechanisms)
- Farghalli A. Mohamed, Ph.D. University of California, Berkeley, *Professor of Mechanical Engineering* (mechanical behavior of materials, creep, superplasticity, strengthening mechanisms)
- Lawrence J. Muzio, Ph.D. University of California, Berkeley *Adjunct Associate Professor of Mechanical Engineering* (thermodynamics, heat transfer, combustion), Registered Professional Engineer
- Joseph Pegna, Ph.D. Stanford University, *Assistant Professor of Mechanical Engineering* (computer-integrated design and manufacturing, geometric modeling, automated manufacturing)
- Dimitri Papamoschou, Ph.D. California Institute of Technology, *Assistant Professor of Mechanical Engineering* (compressible shear flows)
- Gary S. Samuelsen, Ph.D. University of California, Berkeley, *Professor of Mechanical and Environmental Engineering* (combustion processes, sprays, laser diagnostics, and air resources), Registered Professional Engineer
- William A. Sirignano, Ph.D. Princeton University, *Dean, School of Engineering and Professor of Mechanical Engineering* (combustion theory, fluid mechanics, applied mathematics)
- Chang-Lin Tien, Ph.D. Princeton University, *Executive Vice Chancellor and UCI Distinguished Professor of Mechanical Engineering* (heat transfer, thermal radiation, heat pipes), Registered Professional Engineer

Lecturers

- George Allen, M.A. University of California, Santa Barbara, *Lecturer in Mechanical Engineering* (computational geometry, computer graphics, computer-aided design)

Donald J. Barrus, B.S. Tulane University, *Lecturer in Mechanical Engineering* (computer-aided design, computer-aided manufacturing)

Roger D. Brum, Ph.D. University of California, Irvine, *Lecturer in Mechanical Engineering* (digital interfacing and optical diagnostics)

David J. Dimas, Ph.D. University of California, Irvine, *Lecturer in Mechanical Engineering* (computer-aided engineering, experimental modal analysis, numerical methods), Registered Professional Engineer

Roger Rangel, Ph.D. University of California, Berkeley, *Lecturer in Mechanical Engineering* (heat transfer, fluid mechanics, combustion, spray combustion, and turbulent reactive flows)

L. Russell Roberts, Ph.D. Catholic University of America, *Lecturer in Mechanical Engineering* (numerical analysis, probability and statistics, turbulence)

William A. Sowa, Ph.D. Brigham Young University, *Lecturer in Mechanical Engineering* (energy conversion systems, experimental and numerical methods in combustion)

Mechanical engineering is concerned with energy conversion and transfer, forces and motions, and material behavior in the design of systems. Knowledge of mathematics, physics, and chemistry lies at the core of the field, but application of this knowledge to design uses engineering technology—a disciplined way of thinking, modeling, and testing that enables design to proceed despite incomplete information and uncertainty.

The undergraduate option in Mechanical Engineering includes both a traditional mechanical engineering curriculum and a developing focus in aerospace engineering. Both areas include statics, kinematics, dynamics, fluid mechanics, heat and mass transfer, thermodynamics, solid mechanics, mechanical behavior of materials, controls, and experimental methods. Application areas in mechanical engineering include combustion, heat engines, refrigeration, and robotics. Application areas in aerospace engineering include propulsion, aerodynamic design, controls and performance, light weight materials, and terrestrial and aerospace vehicles.

The developing focus in aerospace engineering includes courses especially relevant to aeronautical and space sciences, and additional courses are added each year. The core courses in the mechanical engineering undergraduate curriculum provide the fundamental basis for the specialized courses which students take in their senior year. These courses are Combustion in Practical Systems (ME110), Propulsion (ME112), Digital Control Systems (ME170B), Instrumentation and Data Acquisition (ME180), and Aeronautical Design (ME158). In addition, a substantial proportion of the faculty in the department specialize in aerosciences with research ranging from propulsion to the control of large space structures.

Since mechanical engineering covers a wide spectrum of subjects, many students use the undergraduate curriculum as preparation for further studies in areas such as environmental engineering, medicine, law, and management.

Institute for Combustion and Propulsion Science and Technology

The Institute for Combustion and Propulsion Science and Technology, an Irvine Research Unit, is a multidisciplinary activity addressing both fundamental and applied research in combustion and propulsion. The activity is built on a foundation that has evolved over fifteen years of major collaborative

research activity at UCI which now encompasses faculty, students, and staff in the Department of Mechanical Engineering, the Department of Chemistry, and the College of Medicine. The Institute promotes and expands this interaction, provides a broader portfolio of research experiences and opportunities to graduate and undergraduate students, sponsors a seminar series and workshops, and supports a visitors program to enhance interaction with distinguished scientists from both industry and academia.

The goal of the Institute is to (1) develop a more complete understanding of the physiochemical processes of combustion and propulsion with particular emphasis on turbulent transport, liquid sprays, two-phase particle flows, high-speed and supersonic mixing, laser diagnostics, chemistry-turbulence interaction, and advanced computational methods; (2) establish relationships between these processes and potential health and environmental impacts associated with soot particulate and gaseous pollutant emissions; and (3) apply this understanding to applications of technological importance.

The focus of the Institute is directed to laser diagnostics (velocity, temperature, species concentration, droplet size, droplet velocity, and soot particulate), advanced numerical methods (direct simulation; mass, heat and momentum transport; spray processes), and applications (turbulent transport, spray combustion, chemical kinetics, chemistry-turbulence interaction, and health effects).

The Institute interacts closely with industry and national laboratories in the conduct of both the basic and applied research activities.

Further information about the program is available from Professor G. S. Samuelsen, Director of the Institute for Combustion and Propulsion Science and Technology, University of California, Irvine, CA 92717; telephone (714) 856-5468.

Undergraduate Option in Mechanical Engineering

Bachelor of Science Degree

The undergraduate mechanical engineering curriculum includes a core of mathematics, physics, and chemistry. Electives in the humanities are required for intellectual development. Engineering courses in fundamental areas fill much of the remaining curriculum; a few electives allow the undergraduate student to specialize somewhat or to pursue broader areas.

Requirements for the Bachelor's Degree with the Mechanical Engineering Option

University Requirements: See pages 52-55.

School Requirements: See page 276.

Departmental Requirements: At least 98 units of Engineering and technical subjects. The Core Courses are: Chemistry 1B and 1C, Chemistry 1LBE, Engineering E10, E30, ME52, ME54, EE72, CE150, ME105A, ME105B, ME105C, ME115, ME120, ME130A, ME130B, ME147, ME151A, ME151B, ME151C, ME151PA, ME151PB, ME151PC, ME152A, ME156, and ME170A. Technical electives (15 units) also are required. Technical electives must be approved by the faculty advisor.

In addition, students must aggregate a minimum of 34 design units; at least ten of the 34 design units must be obtained in the courses approved as technical electives. Design unit values are indicated at the end of each course description.

The faculty advisors and the Undergraduate Student Affairs Office can provide necessary guidance for satisfying the design requirements. Selection of elective courses must be approved by the assigned faculty advisor and the departmental undergraduate advisor.

Sample Program of Study—Mechanical Engineering

	Freshman	Sophomore	Junior	Senior
Fall	Math 2A Chemistry 1A, 1LAE ME52 Breadth	Math 3B Physics 5C, 5LC Breadth Breadth	E101 CE150 ME105A Breadth	ME147 ME151A ME151PA ME152A Technical Elective ¹
Winter	Math 2B Physics 5A E10 Chemistry 1B, 1LBE	Math 3A E30 ME54 Breadth	ME105B ME115 ME130A ME170A	ME151B ME151PB Technical Elective ¹ Technical Elective ¹ Breadth
Spring	Math 2C Physics 5B, 5LB Chemistry 1C Breadth	Math 3D EE72 E80 Breadth	ME105C ME120 ME130B ME156	ME 151C ME151PC Free Elective Technical Elective ¹ Breadth

Students *must* obtain approval for their program of study and must see their faculty advisor at least once each year.

¹All technical elective courses must be approved by the faculty advisor and must contain at least 10 design credits.

Coordinated Sample Sets of Technical Electives by Area

	Fall	Winter	Spring
Mechanical Engineering			
Combustion	ME110	ME180	ME112, ME164
Controls		ME170B, ME180	ME170C
Materials		ME155, ME180	ME153
Fluid and Thermal Sciences	ME158	ME121, ME180	ME112 or ME135
Aerospace Engineering	ME110, ME158	ME180	ME112

Program of Study

The sample program of study chart is typical for the accredited option in Mechanical Engineering. The chart shows samples of coordinated sets of technical electives by area of specialization. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor.

Graduate Concentration in Mechanical Engineering

Master of Science Degree

Two options are available to pursue study toward the M.S. degree.

The thesis option requires completion of 36 units of study (six of which can be taken for study in conjunction with the thesis research topic); the completion of an original research project; the writing of the thesis describing it; and approval of the thesis by a thesis committee. This plan is available for those who wish to gain research experience or as preparation for study toward the doctoral degree.

The comprehensive examination option requires completion of 36 units of study, execution and documentation of a design project (which can count for up to three of the 36 required units), and completion of an examination on the course work and project. This plan is available for those who wish to emphasize professional practice.

Doctor of Philosophy Degree

An applicant for admission to the Ph.D. concentration in Mechanical Engineering normally will have completed an M.S. program with distinction from an institution of recognized high standing. Evidence of superior scholarship and potential for original creative work are necessary for admission to the program. Before seeking admission an applicant should communicate directly and in some detail with a prospective faculty sponsor. The student's objectives and financial resources must coincide with a faculty sponsor's research interests and research support. Financial aid in the form of a teaching assistantship or fellowship will ordinarily support only one year of the period of several years required to complete the program. During the balance of the period the student will be in close collaboration with the faculty research director, will be employed as a research assistant through the faculty member's research grants, and will use laboratory supplies, equipment, and computer facilities purchased through these extramural funds. Admission to the concentration requires demonstration of educational preparation, intellectual capacity, dedication, and sufficient financial support.

The Mechanical Engineering faculty have special interest and expertise in five thrust areas: combustion and propulsion, thermal and fluid sciences, control systems, robotics, and materials. Combustion and propulsion encompasses laser diagnostics, experimental methods, and advanced numerical analyses. Thermal and fluid sciences encompass natural convection and radiation heat transfer, turbulent transport, and atmospheric processes. Control systems addresses parameter identification for flexible space structures and advanced experimental design techniques. Robotics includes mechanical design, robot navigation, and coordination of multiple robot systems. Materials research encompasses creep, superplasticity, and advanced composites.

Mechanical Engineering Undergraduate Courses

ME52 Computer-Aided Design (4) F, S. Develops skills for interpretation and presentation of mechanical design drawings. An integrated approach to drafting based on sketching, manual drawing board work, and three-dimensional computer-based CAD techniques is used to develop a modern outlook on mechanical design problems. (Design units: 0)

ME54 Principles of Materials Science (4) W, Summer. Atomic structure, bonding, imperfections, deformation, diffusion, physical and mechanical properties, phase transformation, strengthening processes, and heat treatment. Prerequisites: Physics 5A-B-C, Chemistry 1A-B-C. (Design units: 0)

ME57 Manufacturing Processes in Engineering (2) F, W, S. With laboratory. Machines and processes of mechanical manufacturing. Safety and professional procedures emphasized. Use of measuring instruments, hand tools, lathe, mill, drill press, bandsaw, grinder, welding equipment. Pass/Not Pass only. (Design units: 0)

ME105A-B-C Mechanical Engineering Laboratory. Experimental methods, and experimental and theoretical investigation and analysis of the performance and control of mechanical engineering systems. Report writing and communication skills are stressed.

ME105A (4) F. Static and dynamic response of transducers, design and construction of basic electronic circuitry, and operation of monitoring equipment. Other topics: calibration, uncertainty analysis, development of oral and writing skills, and design, fabrication and performance of an experiment. Prerequisites: Mathematics 3D, Engineering E10, E80, and previous or concurrent enrollment in E101. (Design units: 2)

ME105B (4) W. Experiments on fundamental cycles and processes in thermodynamics. Report writing emphasized. Prerequisites: Engineering E101 and ME105A. Engineering ME115 should be taken concurrently with ME105B. (Design units: 2)

ME105C (4) S. Experimental methods, and experimental and numerical analysis of thermal performances of mechanical engineering systems. Report writing stressed. Heat transfer, thermodynamics, fluid dynamics, thermal properties of materials. Prerequisites: ME54, ME105B, ME120. Engineering ME130B should be taken concurrently with ME105C. (Design units: 2)

ME110 Combustion in Practical Systems (4) F. Combustion and design of gaseous, liquid, and coal-fired combustion systems. Fuels, fuel injection, combustion aerodynamics, and fuel-air mixing. Operating and design aspects of practical systems including engines, boilers, furnaces, and incinerators. Prerequisite: ME115. (Design units: 2)

ME112 Propulsion (4) S. Application of thermodynamics and fluid mechanics to basic flame processes and cycle performance in propulsion systems: gas turbines, ramjets, scramjets, and rockets. Prerequisite: ME115. (Design units: 2)

ME115 Applied Engineering Thermodynamics (4) W. Application of thermodynamic principles to compressible and incompressible processes representative of practical engineering problems—power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion and compressible flow. Design of a selected thermodynamic process. Prerequisite: Engineering E101. Engineering ME115 should be taken concurrently with ME105B. (Design units: 0)

ME116 Statistical Thermodynamics (3) W. Classical and quantum mechanical descriptions of substances and thermodynamic properties of gases, liquids, and solids. Elementary kinetic theory of gases and evaluation of transport coefficients. Prerequisite: Physics 5E. (Design units: 0)

ME120 Heat Transfer (4) S. Fundamentals of heat transfer with application to practical problems. Conduction, convection in laminar and turbulent flow, radiation heat transfer, and combined heat transfer. Application to insulation requirements and heat exchangers. Individual design project. Prerequisites: Engineering E101, ME130A. (Design units: 0)

ME121 Topics in Thermal Design (4) W. Topics in design selected from mechanical engineering. Heat exchangers, heat barriers, heat pipes, solar collectors, thermal environmental controls, and thermal storage systems. Thermo-economic optima. Effect of geometry on volume, weight, capacity, and pumping power. Prerequisite: ME120. (Design units: 3)

ME130A Introduction to Fluid Mechanics (3) W. Hydrostatics; control volume analysis; the basic flow equations of conservation of mass, momentum, and energy; dimensional analysis, effects of viscosity; mathematical analysis of ideal fluid flow. Prerequisites: Physics 5A, Math 3B, and Engineering E80. (Design units: 0)

ME130B Introduction to Viscous and Compressible Flows (3) S. Introduction to the analysis of viscous, incompressible, and one-dimensional compressible flows. Prerequisites: Engineering E101, ME130A. (Design units: 0)

ME135 Compressible Flow (3) S. Compressible effects in fluid mechanics. Isentropic inviscid flow. Channel, Fanno, Rayleigh flows. Acoustics, shock waves, linearized supersonic flow, nozzles and diffusers. Prerequisite: ME130A. (Design units: 0)

ME146 Orbital Mechanics (3) S. Celestial mechanics as applied to space vehicle orbits. Atmospheric entry. Prerequisite: Engineering E80.

ME147 Vibrations (4) F. Analysis of structural vibrations of mechanical systems. Modeling for lumped and distributed parameter systems. Topics: single- and multi-degree of freedom systems, free and forced vibrations, Fourier series, convolution integral, mass/stiffness matrices, and normal modes with design project. Prerequisites: Engineering E30, E80, CE150. (Design units: 2)

ME151A-B-C Mechanical Engineering Design (3-3-2) F, W, S. With laboratory. Kinematic analysis of mechanisms and linkage synthesis. Design of machine elements such as shafts, gears, bearings, springs. Major design project conducted, utilizing all phases of mechanical design methodology: conceptual design, synthesis, analysis, and review. Corequisite: ME151PA-PB-PC. Prerequisites: Engineering E101, ME130A, and ME156 or CE150. (Design units: 3-3-2)

ME151PA-PB-PC Mechanical Engineering Design Project (1-1-1) F, W, S. Project to accompany ME151A-B-C. Corequisite: ME151A-B-C. (Design units: 1-1-1)

ME152A Introduction to Computer-Aided Engineering (3) F. Elements and principles of computer-aided engineering with modern hardware and software are presented with a design focus. Case studies are used to assist in finite-element method techniques. Prerequisites: ME156, ME120. (Design units: 1)

ME152B Application of Computer-Aided Engineering in Design (3) W. A variety of engineering problems are designed with modern computer-aided engineering hardware and software. Prerequisite: ME152A. (Design units: 2)

ME153 Design Failure Investigation (4) S. Survey of the mechanisms by which mechanical devices may fail, including overload, fatigue, corrosion, and wear. Use of fractography and other evidence to interpret failure modes and specify design/manufacturing changes. Students redesign failed parts or structures based on actual parts and/or case histories. Prerequisites: ME151A, ME156. (Design units: 2)

ME155 Composite Materials Design (4) W. Introduction to fiber-reinforced composites for mechanical applications. Properties of reinforcing fibers. Manufacture of fibers and composites. Micromechanics of fiber composites. Strength criteria and failure modes. Macromechanics in design of laminated composite structures. Prerequisites: ME54, CE150. (Design units: 3)

ME156 Mechanical Behavior and Processing of Materials (3) S. Elastic and plastic deformation, yielding criteria, necking, buckling, fracture, fatigue, impact, forming processes and design parameters, and selection of materials. Prerequisites: ME54, CE150. (Design units: 2)

ME158 Aeronautical Design (4) F. Concepts of mechanical design applied to aircraft, sizing, configuration, and aerodynamic analyses as related to performance verification, wing thickness and sweep, wing loading, payload, and takeoff field length. Each student conducts preliminary design and performance analysis of a complete airplane. Prerequisites: Engineering E30, E80, ME130A. (Design Units: 4)

ME162 Engineering Meteorology (3) S. Fundamentals and aspects of meteorology important to engineering, environmental, and aviation problems. Basic physics of weather, dispersion of pollutants, wind loading. A design problem is included. Prerequisite: ME130A. (Design units: 1)

ME164 Air Pollution and Control (4) S. Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies. Prerequisite: Engineering E101. (Design units: 2)

ME170A Introduction to Control Systems (4) W. With laboratory. Feedback control systems. Modeling, stability, and systems specifications. Root locus, Bode, Nichols, and state-space methods of analysis and design. Prerequisites: Engineering E80, Mathematics 3D. (Design units: 1)

ME170B Digital Control Systems (4) W. Methods for analysis and design of discrete-time control systems. Applications of the sampling theorem, z-transforms, difference equations, discrete Fourier transforms. State-space techniques of digital control system design, z-plane stability, frequency response. Prerequisite: ME170A. (Design units: 2)

ME170C Analysis and Design of Control Systems (4) S. System modeling, simulation, analysis, design, and experimental verification of control system operation. Case studies include experiments in hydraulic and pneumatic position control, liquid leveling, force, temperature, and fluid flow control. Prerequisites: ME170B, ME180. (Design units: 3)

ME180 Instrumentation and Data Acquisition (4) W. The use of semiconductor devices, digital and linear circuits in the design of interfaces to mechanical engineering systems. Emphasis on design and use of microprocessor interfacing for control and data acquisition. Prerequisite: ME105A. (Design units: 3)

ME198 Group Study (4) F, W, S. Group study of selected topics in engineering. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

ME199 Individual Study (2 to 4) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Prerequisite: consent of instructor. May be repeated for credit.

Mechanical Engineering Graduate Courses

ME200A-B-C-D Engineering Analysis. Mathematical tools to solve advanced engineering problems. For first-year graduate students in Mechanical Engineering. Prerequisite for each part: Mathematics 3D.

ME200A (3) F. Linear algebra, linear operators (Fourier and Laplace transforms), and complex variables.

ME200B (3) W. Ordinary and partial differential equations, boundary value problems, eigenfunctions and series solutions, special functions.

ME200C (3) S. Tensor analysis, matrices, numerical methods, probability and statistics.

ME200D (3) W. The approximate solution of linear and nonlinear differential equations by perturbation methods. Other asymptotic methods. Ordinary and partial differential equations discussed, with emphasis on problem solving. Applications to mechanical and nonmechanical problems.

ME201A Computer Aided Geometric Modeling (3) W. Boundary representation of solids using polyhedral models, topology representation and boundary evaluation. Visualization techniques. Parametric models for space curves. Prerequisite: ME200A.

ME201B Advanced Geometric Modeling (3) S. Analytical models for shape representation. Shape analysis and shape interrogation. Computational models. Prerequisite: ME201A.

ME202 Differential Geometry (3) W. Advanced calculus with applications to the analysis of curves and surfaces in higher dimensions. Topics include: the properties of real numbers, linear spaces, multilinear algebra, quadratic forms, and the curvature of surfaces.

ME210 Advanced Fundamentals of Combustion (3) W. Premixed, nonpremixed, and heterogeneous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle spray combustion. Prerequisite: ME110.

ME215 Advanced Combustion Technology (3) F of even years. Emphasis on pollutant formation and experimental methods. Formation of gaseous pollutants and soot; transformation and emission of fuel contaminants in gas, liquid, and solid fuel combustion; methods employed to measure velocity, turbulence intensity, temperature, composition, and particle size; methods to visualize reacting flows. Prerequisite: ME110.

ME216 Advanced Thermodynamics (3) F of even years. Statistics of independent particles, development of quantum mechanical description of atoms and molecules, application of quantum mechanics, evaluation of thermodynamic properties for solids, liquids, and gases, statistical mechanics of dependent particles (ensembles). Prerequisite: Engineering E101 and ME200A.

ME217 Generalized Thermodynamics (3) F. Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory. Prerequisites: Engineering E101, ME115 or equivalent.

ME221A Convective Heat Transfer I (3) W. Laminar convective heat transfer in external and internal flows. Similarity solutions. Integral and expansion methods. Introduction to finite difference methods.

ME221B Convective Heat Transfer II (3) S. Turbulent convective heat transfer in external and internal flows. Free convection from external surfaces. Finite difference applications. Prerequisite: ME221A.

ME222 Radiation Heat Transfer (3) F. Black body radiation. Radiative transport equations for surfaces separated by nonparticipating media. Radiant energy transfer through absorbing, emitting, and scattering media. Radiation-conduction interaction. Radiation-convection interaction. Introduction to numerical methods in radiation. Prerequisite: ME120.

ME223A Numerical Methods in Heat, Mass, and Momentum Transport (Laminar Flows) (3) W. Introduction to the discretization of various types of partial differential equations (parabolic, elliptic, hyperbolic). Finite-volume discretization for one- and two-dimensional flows. Use of a two-dimensional elliptic procedure to predict sample laminar flows. Prerequisite or corequisite: ME230A.

ME223B Numerical Methods in Heat, Mass, and Momentum Transport (Turbulent Flows) (3) S. Introduction to turbulence. Reynolds-averaging of Navier-Stokes equations. Second-order closure of the average equations. Use of two-dimensional elliptic procedure to predict confined turbulent flows. Prerequisite: ME223A.

ME224 Convective Mass Transfer (3) F. Concentrations, velocities, and mass fluxes. Mechanisms of mass transport and transport properties in multicomponent media. Mass transfer problems described by ordinary differential equations. Partial differential transport equations and some solutions of technical importance. Interphase mass transfer formulations and solutions. Prerequisites: ME120 and ME200A.

ME230A Advanced Incompressible Fluid Dynamics I (3) F. Vector and tensor notation. Stokes relation between stress and strain, and development of Navier-Stokes equations. Exact solution to one- and two-dimensional, steady and unsteady laminar flows. Lubrication theory and creeping flows. Laminar boundary layers and integral methods of solution. Prerequisite: ME130B

ME230B Advanced Incompressible Fluid Dynamics II (3) W. The course covers waves and potential flow. The course is intended to be an extension of 230A, but students with a strong background in fluid dynamics may be allowed to take it, subject to the instructor's approval.

ME231 Fundamentals of Turbulence (3) S of even years. Phenomenon of turbulence. Reynolds equations. Dynamics of turbulence. Free turbulent shear flows. Wall-bounded turbulent shear flows. Turbulent transport of scalar quantities. Spectral dynamics. Mathematical models of turbulence. Prerequisite: ME230A.

ME232 Atmospheric Turbulence (3) S of odd years. Turbulent motion. Statistical and spectral methods. Homogeneous and shear flow problems. Turbulence in the atmosphere. Boundary layer, effects of buoyancy, rotation. Prerequisite: ME230A.

ME235 Advanced Compressible Fluid Dynamics (3) S. Current and advanced concepts in compressible flows. Methods of characteristics. Slender body theory. Transonic, supersonic, hypersonic similarity rules. Laminar and turbulent compressible shear flows. Prerequisites: ME120, ME130A or equivalent.

ME236 Nonequilibrium Gas Dynamics (4) W. Relates phenomena on the atomic and molecular scale to continuum flow behavior. The real gas effects in high-temperature flows is emphasized. Prerequisite: ME130A.

ME240 Kinematics and Robotics (3) S. Spatial rigid body kinematics is presented with applications to robotics. Orthogonal matrices, Rodrigues' formula, Quaternions, Plücker coordinates, screw theory, and dual numbers are studied using modern projective geometry and multi-linear algebra. Applications include trajectory planning, inverse kinematics, and workspace analysis.

ME247 Advanced Dynamics (3) F. Kinematics and dynamics of three-dimensional complex motions. Lagrangian dynamics, Hamilton's principles. Dynamics of gyros and platforms. Satellite dynamics (spinning, gravity gradient, etc.). Prerequisite: ME147 or equivalent.

ME251A Dislocation Theory (3) F. Theory of elasticity and symmetry of crystals, plasticity and slip systems, stress field of dislocation, dislocation reaction, theories of yielding and strengthening, application of reaction-rate kinetics to thermally activated dislocation motion. Prerequisite: ME54 or consent of instructor.

ME252A Theory of Diffusion (3) W. Solid-state diffusion, analysis of diffusion in solids, thermodynamics of diffusion, application of diffusion theory to phase transformation and deformation problems. Prerequisite: ME54 or consent of instructor.

ME252B Phase Transformations (3) W. Kinetics of nucleation, nucleation theory, isothermal transformation, martensitic transformation. Prerequisite: ME252A.

ME253A Kinetic Phenomena in Materials (3) S. Kinetic phenomena materials from a phenomenological viewpoint. Diffusion, chemical kinetics, particle-fluid interactions, adsorption, evaporation, statistical thermodynamics, kinetics of phase transformations, and spinodal decomposition.

ME253B Solidification Processing (3) S. Principles of control of structure, properties, and shape in processes involving liquid-solid and vapor-solid transformations. Heat flow, solute redistribution, nucleation and growth kinetics; resultant structure and properties. Examples drawn from metal casting and rapid solidification.

ME254A Mechanical Behavior of Engineering Materials (3) S. Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, creep, and fatigue, study of rate-controlling mechanisms and failure modes, fracture of materials. Prerequisite: ME54.

ME254B Plasticity and Metal Forming (3) S. Stress and strain analysis, plasticity equations, yielding, integration of plasticity equations, plastic instability, application of plasticity theory to some forming processes. Prerequisites: Engineering E30, ME54, or consent of instructor.

ME255A Design with Ceramic Materials (3) F. Dependence of ceramic properties on bonding, crystal structure, defects, and microstructure. Ceramic manufacturing technology. Survey of physical properties. Strength, deformation, and fracture of ceramics. Mechanical design with brittle, environment-sensitive materials exhibiting time-dependent strengths. Prerequisite: ME54.

ME255B Science of Composite Materials (3) S. Properties of intentionally inhomogeneous materials, especially composites manufactured for extreme environments, elevated temperatures, wear resistance. Chemical compatibility of constituents, microstructural stability, environmental effects. Micromechanics of particulate and fiber-reinforced composites. Strength criteria, toughness, and failure mechanisms. Thermomechanical effects. Prerequisites: ME54 and CE150A or consent of instructor.

ME256A Fracture of Engineering Materials (3) W. Fracture mechanics and its application to engineering materials. Elastic properties of cracks, the stress intensity factor, the crack tip plastic zone, the J Integral approach, fracture toughness testing, the crack tip opening displacement, fracture at high temperatures, fatigue crack growth. Prerequisite: ME156 or ME254A or consent of instructor.

ME256B Fatigue of Engineering Materials (3) W. Fatigue deformation and damage in engineering materials. Phenomenological descriptions, the Bauschinger Effect, persistent slip bands, extrusions and intrusions, crack nucleation, stage I and II crack growth, threshold effects, crack growth laws, materials selection. Prerequisite: ME256A or ME156 or equivalent.

ME257 Materials Processing Technology (3) F. Concepts underlying the evolution of the microstructure and the mechanical behavior of advanced metallic systems during processing: correlation between microstructures and mechanical behavior. Emphasis on current research areas in material.

ME264 Combustion Particulates and Aerosols (3) S. Behavior of airborne solid and liquid particles in air resources engineering. Description of air drag, gravity, Brownian motion, light scattering, charging phenomena, coagulation, size distributions. Applications include generation and classification of aerosols, lung deposition, formation and characteristics of atmospheric aerosols. Prerequisites: ME130A-B.

ME270A Linear Systems (3) F. Methods of linear systems analysis. Linear spaces and linear operators. Spectral analysis of linear operators. State-space representations of continuous-time and discrete-time linear systems. Response of linear systems—impulse response and state transition operators. Controllability and observability. Realization of rational transfer functions. Stability. Prerequisite: ME170A or EE140A.

ME270B Linear Systems II (3) W. Advanced topics in linear systems: bases, linear operator representations, and Jordan forms. Review of dynamical systems, and stability. Time-varying systems, discrete-time representations, and multi-input/multi-output systems. Introduction to continuous and discrete time linear regulator (LQR) problems. Prerequisite: ME270A.

ME271 System Identification (3) S. Course covers the latest techniques in system identification. Materials covered encompass techniques in both frequency and time domain. Linear and nonlinear dynamic processes, correlation, regression, stochastic approximation, etc., are among the topics covered. Prerequisite: ME270A.

ME272 Robust Control Theory (3) W. Methods for control design of systems with uncertainty. Guaranteed stability and tracking problems. Linear controls via scalar search technique and Riccati equation method. Nonlinear control design via Lyapunov theory. Khari-tonov's theorem extensions for determining robustness. Simultaneous stabilization problems. Prerequisite: ME270A.

ME273 Control of Robot Systems (3) S. Dynamic analysis and control system design of open- and closed-chained mechanisms. Methods for real time control of nonlinear systems. Lyapunov Stability. Advanced motion planning algorithms. Prerequisite: ME247, ME270A.

ME280 Digital Data Acquisition and Analysis (3) S. Principles of digital acquisition of the various types of signals encountered in engineering practice and research and their statistical and spectral analysis. Topics covered include: analog-to-digital conversion, aliasing, recording, and statistical and spectral analysis to be done on a

computer as a part of the course. Prerequisites: ME180, ME200A-B-C.

ME294 M.S. Project (3) F, W, S. Tutorial in which masters-level students taking the comprehensive examination option undertake a masters-level research project.

ME295 Seminars in Engineering (varies) F, W, S. Seminars by individual faculty in major fields of interest. Prerequisite: consent of instructor.

ME296 Master of Science Thesis Research (varies) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering. Prerequisite: consent of instructor.

ME297 Doctor of Philosophy Dissertation Research (varies) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering. Prerequisite: consent of instructor.

ME298 Seminars in Mechanical Engineering (1) F, W, S. Presentation of advanced topics and reports of current research efforts in mechanical engineering. Required of all graduate students in mechanical engineering. Satisfactory/Unsatisfactory only.

ME299 Individual Research (varies) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor.

Graduate School of Management

Dennis J. Aigner *Dean*

Dennis J. Aigner, Ph.D. University of California, Berkeley, *Dean of the Graduate School of Management and Professor of Management* (applied econometrics, statistics, operations research)

Yannis Bakos, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Management* (management information systems, strategic uses of information technology, economics of computing)

Richard A. Brahm, M.P.A. University of Hartford, *Acting Assistant Professor of Management* (diversification and corporate strategy)

George W. Brown, Ph.D. Princeton University, *Professor Emeritus of Management* (decision sciences, business policy)

Robert A. Connolly, Ph.D. University of Maryland, *Assistant Professor of Management* (applied Bayesian methods in financial economics, distribution-free linear modeling methods, financial market behavior, corporate capital structure, intangible and tangible capital investment decisions, business economics)

Imran S. Currim, Ph.D. Stanford University, *Associate Professor of Management* (consumer decision-making)

Joseph F. DiMento, Ph.D., J.D. University of Michigan, *Professor of Social Ecology and Management* (planning, land use and environmental law, use of social science in policy making, legal control of corporate behavior)

Henry Fagin, M.S. Columbia University, *Professor Emeritus of Management* (societal context of organizations)

Paul J. Feldstein, Ph.D. University of Chicago, *Professor of Management and FHP Foundation Distinguished Chair in Health Care Management* (economics of health care)

Gordon J. Fielding, Ph.D. University of California, Los Angeles, *Professor of Social Science and Management and Director, Institute of Transportation Studies* (urban theory and transportation policy)

Peter Freeman, Ph.D. Carnegie-Mellon University, *Associate Professor of Information and Computer Science and Management* (software engineering methods, tools, and management, especially for analysis and design; reusability; study of design representation; development of design training methods)

Maxwell Fry, Ph.D. London School of Economics, *Professor of Economics and Management* (monetary economics and financial institutions)

Mary C. Gilly, Ph.D. University of Houston, *Assistant Professor of Management* (marketing strategy and research, retailing, consumer behavior)

Vijay Gurbaxani, Ph.D. University of Rochester, *Assistant Professor of Management* (economics of information systems management, hardware-software tradeoffs, data processing budgets)

Robert A. Haugen, Ph.D. University of Illinois, *Professor of Management* (corporate finance, agency problems, taxation, investments)

Joanna L. Ho, Ph.D. University of Texas at Austin, *Assistant Professor of Management* (human information processing systems, behavioral issues in auditing and accounting)

L. Robin Keller, Ph.D. University of California, Los Angeles, *Assistant Professor of Management and Social Sciences* (decision sciences)

John Leslie King, Ph.D. University of California, Irvine, *Professor of Management and of Information and Computer Sciences* (computer technology, public policy management, management information systems)

Rob Kling, Ph.D. Stanford University, *Professor of Information and Computer Science and Management* (social analysis of computing, computer technology and public policy, sociology of computing)

Kenneth L. Kraemer, Ph.D. University of Southern California, *Professor of Management and Director of the Public Policy Research Organization* (urban and regional information systems, public administration, public policy development)

Bruce W. Lamar, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Management* (operations research, network design, transportation)

Newton Margulies, Ph.D. University of California, Los Angeles, *Professor of Management* (organizational behavior and organizational development)

Joseph W. McGuire, Ph.D. Columbia University, *Professor of Management* (organizational theory, business policy, business environment, managerial economics)

Peter Navarro, Ph.D. Harvard University, *Assistant Professor of Management* (applied microeconomics, comparative regulation and public policy, industrial organization, public finance)

Jone Pearce, Ph.D. Yale University, *Associate Professor of Management* (organizational behavior, organizational authority, nonprofit organizations)

Cornelia Pechmann, Ph.D. Vanderbilt University, *Assistant Professor of Management* (consumer behavior, advertising strategy, health care marketing, evaluation research)

Lyman W. Porter, Ph.D. Yale University, *Professor of Management and Psychology* (organizational behavior, personnel administration, higher education administration)

Waymond Rodgers, Ph.D. University of Southern California, *Assistant Professor of Management* (financial accounting, commercial lending, human information processing systems, covariance structural modeling)

Judy B. Rosener, Ph.D. Claremont Graduate School, *Assistant Dean of the Graduate School of Management and Lecturer in Management* (gender and management, public policy management, community decision making)

Roland Schinzinger, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Management* (electric power systems, operations research, optimal design), Registered Professional Engineer

Carlton H. Scott, Ph.D. The University of New South Wales, *Associate Dean of the Graduate School of Management and Professor of Management* (operations research, production management)

Neal M. Stoughton, Ph.D. Stanford University, *Assistant Professor of Management* (corporate financial structure, security valuation methods, applications of game theory, optimal contracting)

Eli Talmor, Ph.D. University of North Carolina at Chapel Hill, *Associate Professor of Management* (corporate finance, taxation)

Anne S. Tsui, Ph.D. University of California, Los Angeles, *Assistant Professor of Management* (organization and behavioral sciences)

Alladi Venkatesh, Ph.D. Syracuse University, *Associate Professor of Management* (marketing, marketing research)

Nicholas P. Vitalari, Ph.D. University of Minnesota, *Associate Professor of Management and Information and Computer Science* (management information systems)

Mary T. Washington, Ph.D. University of Southern California, *Assistant Professor of Management* (behavioral decision making, audit judgment processes)

Margarethe F. Wiersema, Ph.D. University of Michigan, *Assistant Professor of Management* (corporate strategy, corporate entrepreneurship, executive succession)

William F. Wright, Ph.D. University of California, Berkeley, *Associate Professor of Management* (financial accounting, expert decision making, expert systems, and decision-support systems)

Adjunct Faculty and Lecturers

Albert J. Ashurst, M.S. University of California, Irvine, *Lecturer in Management* (organizational behavior, organizational theory)

Peter E. Bretschger, B.S. Syracuse University, *Lecturer in Administration* (advertising)

Daniel J. Cooper, J.D. Western State University College of Law, *Lecturer in Management* (federal taxation, corporate taxation)

Frank Ewing-Chow, Ph.D., D.B.A. University of Southern California, *Lecturer in Management* (accounting, financial auditing), Certified Public Accountant

Mary Casey Finan, Ph.D. University of Chicago, *Lecturer in Management* (educational psychology)

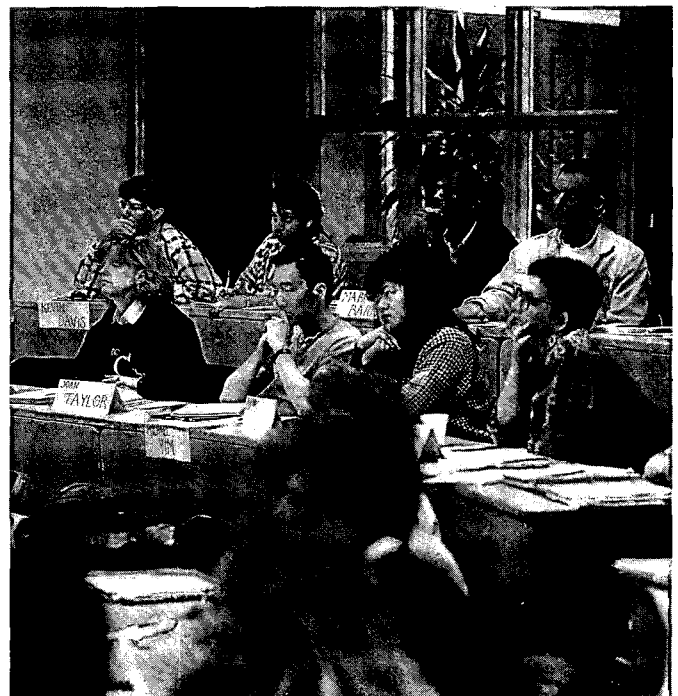
Dennis J. Galligani, Ph.D. University of California, Los Angeles, *Assistant Vice Chancellor Academic Affairs and Lecturer in Management* (administrative internship)

Dvajad Kashefnejad, Ph.D. Claremont Graduate School, *Lecturer in Management* (finance, monetary policy, econometrics)

Charles A. Morrissey, M.B.A. Harvard Business School, *Lecturer in Management* (business policy, corporate strategy)



The recently completed Graduate School of Management Building features a distinctive design and a variety of state-of-the-art facilities. Case rooms, with contiguous seminar rooms, offer both students and faculty a stimulating environment for lectures and discussions.



Robert Rooney, Ph.D. Stanford University, *Lecturer in Management* (econometrics, forecasting)

Leon M. Schwartz, A.B. The Johns Hopkins University, *Vice Chancellor Administrative and Business Services, Director of Hospital Clinics, and Senior Lecturer in Management* (accounting), Certified Public Accountant

Bernard Sisco, B.C.S. Benjamin Franklin University, *Senior Lecturer in Management* (public policy, management in federal sector, planning and analysis)

The Graduate School of Management (GSM) offers an undergraduate minor in Management and graduate study leading to the M.B.A. (Master of Business Administration), and to the Ph.D. degree in Administration. The undergraduate minor is designed for those who wish to gain some insight into issues of modern management, as well as those who anticipate future graduate work in Management. The Master's degree is professional in nature; the Ph.D. in Administration is for those who wish to pursue a career in scholarly research.

The Master's program is intended to provide future managers with a firm foundation in the basic disciplines and in management tools and techniques. Each student in the Master's program focuses upon an institutional area and may develop expertise in one or more functional specializations. The Ph.D. program for the field of administration has academic and research objectives.

Educational Objectives

Three basic premises underlie the School's philosophy of graduate education. First, there are significant phenomena and problems common to business, educational, and governmental organizations; second, a common set of disciplines, concepts, techniques, and technologies exist which are appropriate to a wide range of organizational or scholarly roles; third, many administrators in the future will work in more than one of the three arenas during their careers.

Regardless of the content of particular courses, it is expected that all degree candidates will be exposed to and have the ability to use the following:

General Knowledge. The broad context of organizations and management; the late twentieth century (significant trends, conditions, and problems); history of science, scientific inquiry, and the philosophy of science; economic, political, and social analysis.

Conceptual and Empirical Knowledge of Organizations. Basic concepts of management; the structure and functions of organizations, including comparative analysis and inter-organizational relations; levels and units of decision making; individual behavior and group norms; operating environments of organizations.

Specific Knowledge of Particular Arenas of Administration. In-depth study of specific institutional environments for administrative practice, such as governmental and business organizations, and other types of organizations.

Mathematics and Statistics. As tools of precise reasoning, as languages which will tend more and more to dominate professional and scholarly literature, and above all, as foundations for relevant quantitative methods.

Technical Bases of Management. Decision processes; operations research; systems and policy analysis; budgeting and accounting techniques; personnel policies; techniques for measuring and affecting attitudes and behavior; research design and strategies.

Management Information Systems. Computer technology, information sciences, and basic computer applications.

General Skills. Political skills, effective management of interpersonal relations, leadership strategies and tactics, and competence in oral, graphic, and written expression.

Professional Orientations. Identification of factors, values, and policies which might bear on successful, responsible, and intellectually honest performance of organizational roles. Recognition of the administrator's potential contributions to society and of ethical and moral problems which arise from social research and the management of human enterprises.

General Admission Requirements

Evaluation of the applicant's file for admission to the Master's and Ph.D. degree programs will consist of an integrated assessment of all materials (test scores, transcripts of previous academic work, statements of purpose, and letters of recommendation). The University admission standard of a 3.0 or better undergraduate grade point average (on a 4.0 scale) is required. The minimum TOEFL (Test of English as a Foreign Language) score acceptable for study at GSM is 570.

Requests for application material should be addressed to the Graduate School of Management, University of California, Irvine; Irvine, California 92717.

Doctor of Philosophy in Administration

GSM admits students for the Ph.D. in the fall quarter only. Deadline for application is April 1. The Ph.D. program requires a commitment to full-time study. In addition to the other requirements, Ph.D. applicants are encouraged to submit a previously prepared paper (research report, Master's thesis, essay, case study) which may be indicative generally of the applicant's interests and capabilities.

GSM offers the Ph.D. in Administration to students with backgrounds in a variety of disciplines. While a master's degree is preferred, students may be admitted to the doctoral program directly from the baccalaureate degree. There are many appropriate undergraduate majors, including (but not limited to) psychology, political science, business or public administration, mathematics, computer sciences, economics, sociology, and so forth. Students with academic strengths in disciplines not usually considered as precursors for management (e.g., natural sciences, humanities, and the arts) are encouraged to apply. The Ph.D. program is designed to prepare students for academic careers in a number of the fields of management, e.g., organizational behavior, operations research, marketing, public policy, finance, business policy, or management information systems. Requirements of the Ph.D. program include a broad knowledge of core disciplines as represented by the 14 common core courses of the Master's degree program. In addition, the Ph.D. student must qualify as a skilled researcher and must complete a dissertation demonstrating these skills. There are no foreign language requirements in the GSM Ph.D. program.

Although there is considerable variation in the length of time beyond a Master's degree needed to complete the Ph.D., a realistic range is four to six years. The Ph.D. program is divided into three phases: preliminary, qualification, and dissertation.

In the qualification phase the student prepares for dissertation research in an area of specialization. This phase is completed when an oral qualifying examination is passed and the candidacy committee recommends advancement to candidacy for the Ph.D.

The dissertation phase involves a significant original research project which demonstrates the Ph.D. student's creativity and ability to launch and sustain a career of research.

Master's Degree Programs

GSM admits students for study leading to the Master's degrees in the fall quarter. The deadline for completion of all phases of the application procedure is May 1. In addition to the general University rules governing admission to graduate study, GSM normally requires the following:

1. Those applicants seeking to be admitted to the M.B.A. program are required to take the Graduate Management Admission Test (GMAT).
2. College-level mathematics including a course in introductory calculus, statistics with probability, and introductory computer programming. Applicants without adequate mathematical or computer preparation may be admitted with the condition that they complete preliminary courses with a grade of B or better. These courses should be completed by fall quarter, but no later than the end of the second quarter in residence. Undergraduate courses in both the social sciences (e.g., economics, political science, psychology, sociology) and information and computer sciences are *strongly recommended*.

The Graduate School of Management offers the M.B.A. (Master of Business Administration) degree which requires a minimum of 23 quarter courses (92 units) with a minimum grade point average of 3.0 in the Core and overall.

The Master's degree program normally takes two full academic years or their equivalent in part-time registration. Students with substantial personal or professional commitments take two courses per quarter and are required to complete the Master's degree in no more than four years. To accommodate the needs of these students, GSM offers a number of courses each quarter during the late afternoon and evening hours (beginning at 4:00 p.m.). There is no thesis required. The courses in the Master's degree program are divided into two groups, each group designed to achieve specific educational objectives. The courses are divided as follows: 14 required Common Core Courses and nine elective courses which students select to emphasize career goals and educational interests.

The 3-2 Program for Undergraduates

In addition to the two-year Master's program for students who have already received a bachelor's degree from the University of California or another institution, outstanding UCI undergraduate students may enter a cooperative 3-2 Program with GSM and most other campus units. Acceptance into the 3-2 Program constitutes advance admission to the graduate program. Such students complete their undergraduate major requirements by the end of the junior year. During their senior year, they take graduate courses in GSM. These courses are used to satisfy their undergraduate unit requirements, and at the same time apply toward their graduate degrees. Successful completion of the requirements in the program normally leads to the bachelor's degree in the cooperating discipline after the fourth year, and an M.B.A. degree after the fifth year. The ability to complete both degrees in five years may vary by academic program. Students should consult with their academic counselor in their major School for further information about completing undergraduate requirements in three years. Students contemplating entering such a program should contact the Graduate School of Management prior to, or early in, the start of the junior year, for the purpose of program consultation.

NOTE: With the exception of 3-2 students, no undergraduates will be enrolled in GSM graduate-level courses.

Required Course Work

Common Core Courses, each of which is four units, are: Management of Complex Organizations, Statistics for Management, Operations Research for Management, Organizational Analysis for Management, Financial and Managerial Accounting for Management, Microeconomics for Management, Macroeconomics for Management, Government and Public Policy, Computer and Information Systems for Management, Marketing for Management, Corporate Finance, Operations Management, Business Strategy.

The remaining coursework for the Master's degrees will consist of nine electives for the M.B.A. The major emphasis in the elective courses will be to develop additional depth in a discipline or interdisciplinary area or specialized competence in the use of a particular set of technical tools and methods. The student will select the electives in light of the student's educational and career goals and interests.

Special Opportunities

To complement the academic curriculum of GSM, a Management Internship Program provides practical application and work experience to selected GSM Master's students. Student interns are employed in administrative positions by local organizations. Course credit is available for participants in the Internship Program through the course "Management Internship Seminar." GSM faculty and organizational representatives as well as student interns participate in this seminar which deals with specific topics and projects encountered by the interns in their positions.

Opportunities for students to take part in ongoing research exist through two University-wide research units based on the Irvine campus. Through the Public Policy Research Organization (PPRO) a student may participate in research on significant public policy issues. Current projects include a nationwide study of local government information systems. The Institute of Transportation Studies (ITS) conducts research in the areas of urban transportation policy and planning, transit management and labor relations, and transportation system evaluation. Students interested in these areas may have an opportunity to work on an ITS project.

Placement Services

The GSM Placement Office, located within the School, was established by UCI's Career Planning and Placement Center in order to serve the unique placement needs of M.B.A. students and alumni. It has two main functions: (1) attracting a variety of organizations to interview and hire graduates and (2) counseling students in career opportunities and the techniques necessary to conduct effective job searches, not only for their first jobs but throughout their careers. The relatively small size of the M.B.A. program allows considerable interaction between the Placement Office and students.

Executive M.B.A. Program

The Executive M.B.A. Program is designed for managers who are highly motivated toward a career in management of organizations and for those currently in executive positions. It enables participants to enhance their management skills while obtaining a high-quality advanced education. Students may continue in their full-time professional roles while enrolled in the program. Limited class sizes are maintained, and all participants gain extensive work and managerial experience.

The program consists of a 92-unit course of study completed on alternating Fridays and Saturdays, with three five-day residential sessions held during the 21-month sequence.

Emphasis is placed on organizational and interpersonal skills; increased competence in specific management techniques; overall management training; and developing an understanding of the integration of business and the environment.

Further information may be obtained by contacting the Director, Executive M.B.A. Program, Graduate School of Management, University of California, Irvine; Irvine, California 92717.

Undergraduate Minor in Management

The GSM faculty and the Dean of Undergraduate Studies offer an undergraduate minor in Management. The minor consists of seven courses: one lower-division introductory course and six upper-division courses.

Students are eligible to apply for the minor in Management if they have completed all prerequisite courses (including Management 5) with a grade no lower than C (2.0) and have upper-division standing. Completion of the prerequisite courses does not guarantee admission to the minor in Management. Admission is on a competitive basis and students must submit an application, transcripts, and a statement of purpose. The deadline for completion of the application is May 1. Interested students may obtain further information from the GSM Student Affairs Office, Room 220.

In establishing the GSM undergraduate minor in Management, the faculty anticipated three types of students to be drawn to courses in administration: (1) students who wish to learn about the administration of organizations as a way of gaining appreciation for a significant aspect of the culture, (2) students preparing for careers in other fields that require some knowledge of administration but not a high concentration in the field, and (3) students who expect to go on to graduate work in administration and who wish early guidance and undergraduate work appropriate to this career objective.

Prerequisite Courses

The following are prerequisite for enrolling in the upper-division undergraduate minor courses: Management 5; Social Sciences 12A and 12C; Mathematics 2A; one from either Mathematics 7, Mathematics 131A-B-C, Social Sciences 11A-B-C, Social Sciences 100A-B-C, Social Ecology 13, Social Ecology 166A-B-C, or Civil Engineering 105.

Note: While not required for the undergraduate minor, Social Sciences 12B is a prerequisite for Social Sciences 12C.

Transfer students should check with their college counselor for established equivalencies for these prerequisite courses.

Courses Satisfying the Undergraduate Minor
Management 5, 160, 181, 183, 185, 186, and 187.

Undergraduate Courses

5 Managing in Contemporary Organizations (4) F, W, S, Summer. Overview of the field of management including an historical perspective as well as current theory and concepts, to help the student understand the manager's role. Views of basic managerial processes, e.g., planning, organizing, managing human behavior.

160 Introduction to Public Management (4). This course is designed to introduce undergraduate students to the study of public administration. For those expecting to take further courses in the field or considering a public service career. Prerequisites: Management 5 and upper-division standing.

181 Managing Organizational Behavior (4). Basic theory and concepts which provide the manager with tools for understanding behavior of people in organizations. Areas such as individual, group, and organizational determinants. Prerequisites: Management 5 and upper-division standing.

183 Managerial Decision Making (4). Basic processes and tools of managerial decision making. Identification of objectives, controllable and noncontrollable variables, phases of decision making, role of computers, quantitative tools for managerial decision making. Prerequisites: Management 5 and upper-division standing, and a basic course in statistics with probability.

185 Introduction to Financial Accounting (4). Lecture, three hours. Acquisition, reporting, and use of financial information in a business organization. Emphasis on use of information generated by the accounting system for decision making, planning, and control. Public sector analogies considered wherever possible. Prerequisites: Management 5 and upper-division standing.

186 Introduction to Managerial Finance (4). Lecture, three hours. Basics of financial administration. Capital budgeting, cost of capital, cash budgeting, working capital management, and long-term sources of funds. Provides a basic understanding of issues and techniques involved in financial decision making. Prerequisites: Management 5 and 185; upper-division standing.

187 Introduction to Marketing (4). Basic marketing concepts; discussion of the role marketing plays in modern society. Topics: industrial and consumer marketing, promotion, distribution, and pricing theory. Prerequisites: Management 5 and upper-division standing.

Graduate Courses

200 Management of Complex Organizations (4). Focuses on the nature and functions of the managerial job in the context of the internal and external environments of complex organizations. Introduces students to the uses of managerial tools in organizational problem solving.

201A Statistics for Management (4). Lecture, four hours. Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics: classical estimation and hypothesis testing, regression, correlation, analysis of variance, nonparametric methods, and statistical decision theory. Prerequisite: basic statistics with probability.

201B Operations Research for Management (4). Lecture, four hours. Tools of mathematical decision-making with emphasis on model applicability, formulation, and interpretation. Topics: linear programming, simulation, and stochastic processes. Prerequisite: basic course in calculus. Management 201A recommended.

202 Organizational Analysis for Management (4). Focuses on human behavior in organizations. Topics include motivation and leadership, power and influence, group dynamics, and intergroup relations. Applications of job and organizational design, organizational development, and human resources management techniques are examined.

203A Financial Accounting for Management (4). Nature and purpose of accounting, principal accounting instruments, and valuation problems.

203B Managerial Accounting for Management (4). Focuses on the needs of the manager rather than the needs of stockholders and others. Introduces the concepts and tools of internal reporting. Emphasis on use of internal accounting reports and analyses for decision making. Prerequisite: Management 203A.

204A Microeconomics for Management (4). Economic analysis of individual decision units. Topics: introduction to demand and supply curves, production functions, cost curves, equilibrium of the firm, perfect competition, monopoly, imperfect competition, demand and supply of inputs. A knowledge of algebra and elementary calculus is assumed. Prerequisites: calculus and linear algebra.

204B Macroeconomics for Management (4). Principal determinants of national income and employment, with emphasis on concepts, tools, and data. Application of classical, Keynesian, and other models to fiscal and monetary policy. Prerequisites: calculus and linear algebra; Management 204A.

205 Principles of Marketing for Management (4). Introduction to the field of marketing. Objectives include: developing familiarity with terms, techniques, and institutions in marketing environment; acquainting students with the type of decisions made by marketing managers, and the factors influencing these decisions.

206 Government and Public Policy (4). Political analysis related to management of organizations. Topics: political environment of management, concepts and processes central to political analysis, bureaucratic politics, politics and the manager.

207 Information and Computer Systems for Management (4). Introduction to computer systems and technology; introduction to management-oriented applications of computing; opportunity for hands-on experience for management-related tasks. No prior computer experience required.

208 Operations Management (4). Introduction to philosophy and techniques of operations and production management. Topics: project planning, risk evaluation, and decisions with regard to resource allocation, materials and inventory, service, scheduling, distribution and facilities. A blend of quantitative and qualitative considerations. Prerequisites: Management 201A and B. Same as EE281D.

209 Corporate Finance (4). Introduction to the techniques of financial analysis and the management of a firm's sources and uses of funds. Selected problem areas in financial management, including short-term asset management; capital budgeting and capital structure policy; dividend policy; mergers and leasing. Capital markets also are discussed. Prerequisites: Management 201A, 203A, 204A.

210 Business Strategy (4). Primarily a lecture-case (implemented through discussion) course. Focuses upon the decision-making processes of company managers. Draws upon a wide variety of fields: marketing, finance, production, personnel, organization, etc. Prerequisites: Management 205, 208, 209.

Electives

211 Forecasting and Futures Research (4). Basic theory and techniques used to forecast future activities in technological, economic, social, and political arenas. Impact of forecasting on managerial decision making. Prerequisites: Management 201A and 201B.

212 Advanced Seminar in Business Administration (4). Seminar, three hours. Further exploration of selected topics from Management 210. Prerequisite: Management 210.

213 Industry Competitive Analysis (4). Provides an understanding of the concepts useful for analyzing industries and determining the sources of competitive advantage. Designed to broaden students knowledge of real-life competitive environments by applying state-of-the-art concepts to a rich array of industry structural settings. Prerequisites: Management 203A, 205, 209, 210.

214 Entrepreneurship (4). Examines the talents, experience, knowledge, and other resources needed to start a successful growing enterprise. Looks into the way in which businesses are started and the way that they grow.

220 Organizational Change (4). Seminar, three hours. Processes and technologies for bringing about change in organizations. Emphasis on rapidly growing body of theory, concepts, and techniques dealing with ways in which organizations can become more adaptive and meet challenges of modern society. Prerequisites: Management 200 and 202, or consent of instructor.

221 Methods of Organizational Research (4). Seminar, three hours. Development of critical-analytical skills criticizing published research and theory. Necessary skills to design research effectively. Prerequisites: Management 200 and 202, or consent of instructor.

222A-B-C The Consultative Process (4-4-4). Process and dimensions of the consultant's role. Topics include identification and definition of the client system, establishing contracts, ethics in consulting, tools and techniques in consultation, terminating the relationship. Prerequisite: Management 200.

223 Interpersonal Dynamics (4). Theory and practice devoted to nature and significance of interpersonal dynamics in organizational and administrative contexts. Opportunity to enhance awareness of interpersonal style and impact, to develop increased competence interpersonally. Prerequisite: Management 200.

224 Seminar in Human Resources Management (4). Basic topics in personnel and human resources management, including personnel systems, underlying assumptions and values expressed by human resources policies, staffing organizations, training and development, and performance appraisal systems. Prerequisites: Management 200, 202.

225 Advanced Micro-Organizational Behavior (4). Seminar, three hours. Recent developments in the areas of motivation, leadership, power and influence, communication, and group and intergroup relations are explored. Current research and theory are applied to the practical problems of behavior in organizations. Prerequisites: Management 200, 202.

226 Advanced Macro-Organizational Behavior (4). Seminar, three hours. Recent developments in organizational theory. Topics include the rational model of organizations and challenges to the rational model such as the institutional model, the natural evaluation model, and organizations as cultural systems. Prerequisites: Management 200, 202.

227 Doctoral Seminar in Organizational Behavior (4). Seminar, three hours. Examines recent research and literature in the field of organizational behavior. Open only to advanced Ph.D. students in organizational behavior and related areas.

231A-B-C Financial Reporting Standards (4-4-4). Standards required of public and business organizations when preparing financial reports in accordance with APB, FASB, and SEC rules, and the effects such rules may have on individual organizations or societal sectors. Prerequisites: **231A:** Management 203A; **231B:** Management 203A and 231A; **231C:** Management 203A and 231B.

232 Federal Taxation (4) S. Methods of researching federal laws governing income taxation of individuals and corporations, and provisions for a tax-exempt status. Prerequisite: Management 203A.

233 Financial Auditing (4). Concepts and techniques of organizational auditing as an extension of financial audit methodology. How organizational auditing improves goal attainment by providing reliable information on the effectiveness and efficiency of organizational activities. Public and private organization cases evaluated via organizational auditing. Prerequisite: Management 203A.

234 Financial Statement Analysis (4). How accounting information may be used for analysis and decision making. Measurements from external accounting statements may be used in the form of ratio comparisons to directly measure several economic concepts. Prerequisite: Management 203A.

235 Advanced Managerial Accounting (4). Design of cost information and systems used to plan and control organizational activities; procedures used to account for unit, process, and program costs; cybernetic evaluation of costing procedures; cost estimation, analysis, and accounting via computers. Prerequisites: Management 203A, 203B.

241 Financial Markets (4). Seminar, three hours. Roles, characteristics, policies of financial institutions, and behavior of capital markets. Analysis of interest rate determination and flow of funds. Attention to effect of federal monetary policy on financial sector. Prerequisites: Management 201A, 201B, 204A, 204B, and 209. Same as Social Sciences 214M.

242 Portfolio Analysis (4). Seminar, three hours. Acquaints students with the conceptual and technical foundation of modern investment analysis. Major emphasis is placed on the application of analytic tools to asset selection, management, and evaluation of investment activities in the portfolio setting; risk-reward characteristics of the portfolio; and performance measures. Prerequisites: Management 201A, 201B, 204A, 204B, and 209.

243 Investments (4). A comprehensive survey of investment alternatives from which the individual or institution selects, including the analytical techniques and principals involved in the analysis of individual financial instruments; the functioning of financial markets; and a review of research on the securities markets and the valuation of securities. Prerequisites: Management 201A, 201B, 204A, 204B, and 209.

244 Multinational Finance (4). Determination of foreign exchange rate and relationships of international financial markets. Financial problems in management of multinational business. Prerequisites: Management 201A, 201B, 204A, 204B, and 209.

245 Advanced Financial Theory (4). Decision making under uncertainty, theories of asset prices, efficiency of capital markets, and determinants of capital structure. Develops theoretical approaches to financial problems and applies them to fundamental management issues, such as dividend policy, option pricing, and capital budgeting. Prerequisites: Management 201A, 201B, 204A, 204B, and 209.

246 Mortgage Banking (4). Analysis of issues in the mortgage and investment banking areas including mortgage innovations such as adjustable rate mortgages, mortgage-backed securities, hedging risk of holding mortgage-related instruments, and identification and analysis of developments in the industry. Prerequisites: Management 201A, 201B, 203A, 204A.

247 Options Markets (4). Topics include fundamental aspects of puts and calls, market-making under the "open outcry" system, margin, arbitrage restrictions on option values, binomial-option pricing formula, Black-Scholes derivation and formula, Martingale measures, futures, interest-rate, and index options. Prerequisites: Management 201A, 201B, 204A.

251 Consumer Behavior (4). Examines consumer decision making process with emphasis on application of concepts and research findings from behavioral sciences to solution of marketing problems. Includes models of consumer decision making, consumer information processing, theories of attitude and attitude change, attribution theory, mass communication effects, and sociological influences on consumer decision making. Prerequisite: Management 205.

252 Marketing Research (4). Methods of measuring, examining, and predicting factors that affect the marketing process. Various aspects of the research process examined, including problem formulation, research design, data collection methods, sampling, statistical analysis, and methodological considerations. Use and evaluation of research as an input to the marketing management process are emphasized. Prerequisites: Management 201A, 205.

253 Seminar in Advertising (4). Addresses the business of advertising. Topics include: media decisions, the creative process, advertising research, industrial advertising, the role of the agency, and advertising campaigns and presentations. Prerequisite: Management 205.

254 Services Marketing (4). Examines how service organizations differ in many important respects from manufacturing businesses, requiring a distinctive approach to marketing strategy, development, and execution. Considers private, public, and not-for-profit service organizations. Prerequisite: Management 205.

255 International Marketing (4). Provides an understanding of the problems and perspectives of marketing across national boundaries, and develops the analytical ability for structuring and controlling marketing programs related to overseas business. Prerequisite: Management 205.

260 Public Financial Management (4). Intergovernmental fiscal relations. Concepts and practices of public finance and governmental budgeting in the U.S. Public finance theory including theory of taxation; tools and techniques of public financial management.

261 Collective Bargaining in Public and Private Sectors (4). Focus on contemporary collective bargaining in business and government. Topics: public policy framework, union formation, contract negotiation and administration, and grievance arbitration.

262 Information Systems in Government (4). Seminar, three hours. Design, development, management, and evaluation of urban information systems, with special emphasis on trade-offs among efficiency, effectiveness, privacy, and other key values affected by alternative financing, operating, and control policies. Prerequisite: Management 207. Management 263 recommended.

263 Governmental Systems (4). Seminar, three hours. Structures, processes, interactions, and functions of evolving systems of federal, state, and local government in the U.S. viewed through multidisciplinary perspectives. Current controversies over theories and their underlying social and ideological bases.

264 Issues in Public/Private Sector Interactions (4). Types of markets and politics represented in government and business facilitation joint ventures; private production of public services; government protection of business; knowledge transfer from business and vice versa; personnel transfer between business and government.

265 Issues in Financing Health Services (4). The equity and efficiency of government policies to redistribute medical services. Economic justifications for government intervention are discussed together with appropriate taxation and expenditure policies. Specific policies analyzed include Medicare, long-term care, and mandated employer coverage.

266 Economics of Health Care Services (4). The organization and delivery of medical care services in the United States. The performance of this sector is analyzed using microeconomic analysis; the

criterion of economic efficiency is used to evaluate both current and proposed public policies.

267 Management of Health Care Organizations (4). Provides knowledge from organizational psychology and organizational behavior to understand and effectively manage individuals and groups in health service organizations. Topics include power and conflict resolution, interpersonal dynamics, organizational development, decision-making, group dynamics, and performance appraisal.

268 Health Care Financial Management (4). Concepts and techniques of managerial accounting and finance for health care administrators. Topics covered include hospital revenue sources, cost accounting, budgeting, working capital management, capital financing, financial feasibility, and financial planning.

269 Strategic Planning and Marketing of Health Care Services (4). The competitive health care environment requires increased emphasis on strategy, positioning, marketing, and planning. Provides students with the concepts and methodologies employed by health care managers in the planning and implementation of innovative services and programs.

271 System Analysis and Design (4). Understanding of development process for computer-based information processing systems. Beginning stages of development process, including analysis of current system, definition of new system, documentation of the information requirement, and basic and advanced systems analysis methods and techniques. Prerequisite: Management 207.

272 Decision Support Systems (4). Seminar, three hours. Introduction to the concept of Decision Support Systems (DSS). Explores prevailing concepts through the development of topical projects related to the technology and use of DSS in organizations. Prerequisite: Management 207.

273 End-User Computing (4). Explores the technical and managerial implications of end-user computing by combining hands-on experience with an examination of pertinent computational and managerial issues for end-user computing success. Prerequisite: Management 207.

274 Database Management Systems (4). Presentation of generalized systems designed to manage the data resources of organizations. Topics include data structures, file processing and access methods, network, hierarchical and relational data models. Hands-on experience with a relational database management system. Prerequisite: Management 207.

275 Strategic Management Information Systems (4). Focuses on the economic and competitive implications of strategic information systems. Topics include the increasing importance of end-user and departmental computing, the rapid pace of change in the telecommunications environment, and the involvement of line managers in the information systems design. Prerequisite: Management 207.

276 Business Telecommunications (4). A brief overview of telecommunications technology. Topics include communication-based applications such as electronic mail systems, Videotex, micro-mainframe links, the management organizational networks and departmental computing, and the strategic potential of information systems relying on telecommunications. Prerequisite: Management 207.

277 Economics of Information Systems Management (4). Examines problems in achieving effective use of computers in organizations including control and coordination problems, pricing issues, data processing budgets, performance measurement and evaluation, and cost trends. Prerequisite: Management 207.

280 Legal Environment of Business (4). Nature, historical background, and practical operation of American legal system and its impact upon policy making and administration in large organizations. Constitutional and political relationships which define and limit operation of systems.

281 Business Law (4). Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages.

282 Selected Legal Topics (4). Selected legal issues in formation, operation, and dissolution of corporations, partnerships, and sole proprietorships; emphasis on advantages and disadvantages of each

in terms of taxation, finance, obligations to third parties, and operating problems.

285 Gender and Management (4). Focuses on issues related to sex roles and management including sex roles and organizational structure, tokenism, networking, managerial style, affirmative action, sexual harassment, mentoring, and dual-career marriage.

290 Special Topic Seminars (4-4-4) F, W, S. Seminar, three hours. Each quarter a number of special topic seminars are offered in the 290 series. These seminars are not sequential and may be repeated for credit providing the topic varies. Examples of possible topics include Communication in Organizations, Power and Authority in Organizations, Selected Topics in Personnel, International Management, Health Care Administration.

297A Doctoral Proseminar (4). Analysis of the central theories and theoretical controversies in the field of management. Examination of the formal education for managerial careers and exploration of issues relating to professional careers in research and scholarship in the field of management. Satisfactory/Unsatisfactory only.

297B Doctoral Seminar in Research Methods (4). Provides a first exposure to some fundamental issues in the conduct of research and development of the domain of knowledge relevant to their fields. Satisfactory/Unsatisfactory only.

297C Doctoral Seminar in Statistical Analysis (4). Emphasizes techniques for the testing of hypotheses derived from organizational theory (or social science theories in general); touches lightly on traditional business statistics used in organizations. Satisfactory/Unsatisfactory only.

297D Doctoral Dissertation Seminar (4). Focuses on the development of dissertation proposals, including selection of research questions, literature review, research design, and data analysis. Students defend proposals developed during the course. Satisfactory/Unsatisfactory only.

297E-F-G Management Research Seminar (4-4-4). Colloquium series consisting of current research presented by GSM faculty and other distinguished scholars. Satisfactory/Unsatisfactory only.

298A-B-C Management Intern Seminar (4-4-4). Seminar, three hours. The Management Intern Program provides students with an opportunity to put into practice concepts, skills, and tools acquired in other parts of the GSM program. Weekly seminar sessions augment internship experiences with analyses of relevant administrative issues. Intended primarily for second-year Master's students.

299 Individual Directed Study (4). Individual study under the direction of a selected faculty member. Prerequisite: determined by instructor.

Executive M.B.A. Program

Admission to the Executive M.B.A. Program is a prerequisite for enrollment in Management EP278 through EP296.

EP278 Organizational Analysis for Management (5). Introduces the analysis of behavior in organizations and organization theory. Includes individual dimensions of organizational behavior, interpersonal processes, group processes, group characteristics, intergroup relations, and organizational design. Topics emphasized are communication, motivation, leadership, influence and authority, person perception, individual differences, and conflict.

EP279 Statistics for Management (5). Introduces statistical concepts through study of their applications to the following problems: making sense of numerical information, dealing with uncertainty, sampling, analyzing relationships, forecasting, and decision making in an uncertain environment.

EP280A Managerial and Financial Accounting (5). Accounting for the executive. Functions, concepts, techniques, and the basic tools of accounting are emphasized. Stress is on the use of accounting information from the user's viewpoint.

EP280B Managerial Finance (5). Examines the function in the short and long term. Emphasis on the ability to analyze financial problems, such as the cost of a loan, whether to undertake a project, and whether to lease or buy. Topics include the financial infrastructure of the U.S. and world economies.

EP281 Managerial Economics (5). Provides an understanding of the basics of supply and demand so that the student can apply economic

analysis to problems encountered in management positions. Students are expected to analyze real-world problems technically with the models developed in class and to evaluate the consequences of alternative actions.

EP282A Operations Research for Management (5). Focuses on the application of the quantitative model-building approach to problem solving by integrating modern computer technology with quantitative techniques. Emphasis on problems that are amenable to quantitative analysis; mathematical model business decision making situations; computer output arising from the numerical analysis of models and the managerial significance of the results.

EP282B Operations Management (5). Focuses both on the elements associated with the design and operation of productive systems and the integration of these elements within the overall corporate strategy. Contemporary issues such as international management practice, the universal use of computers, and advances in automation and robotics are introduced as appropriate.

EP283 Management Information Systems (5). Acquaints executives with the successful implementation and use of computers in organizations. Emphasis on basic operations of computer systems and capabilities; organizational computer applications; roles played by management and users in the coordination, planning, development, and implementation of computer technology in organizations.

EP284 Marketing Strategy (5). Provides a basic understanding of the marketing function in a variety of organizations: profit and nonprofit, product- and service-oriented, consumer- and industry-oriented. Emphasis on the role of strategy as it relates to the marketing function and the total organizational plan.

EP285 Aggregate Financial Activity and the Firm (5). Defines the concepts of unemployment, inflation, and aggregate output, to introduce modern economic theories that propose to explain the determination of these variables and their relationship to government policy.

EP286 Business Policy and Strategy (5). Focuses on the responsibilities of a general manager of the company and tasks that are performed to determine the shape, character, and future of the total enterprise.

EP287 Business and Government (5). Focuses on political theories, concepts, and tools of analysis and how they explain business/government interaction; views how political constraints affect policy-making in the firm and business/government joint ventures; focuses on knowledge and personnel transfer between business and government and the private production of public services.

EP288 International Finance (5). International monetary and financial economics; international investment portfolio decisions and international trade and financial institutions. Economics of overseas subsidiaries, technology transfer, and plant location issues. Elements of competitive strategies in international product markets.

EP289 Issues in Contemporary Management (5). Demonstrates the relevance of and provides an overview of what has been done in anticipating and shaping the future. Tolls and sources of information are introduced. An awareness of the merging issues which may shape the future of organizations, industries, and nations is stressed.

EP294 Introduction to Professional Management Education (7) S. Introduces the process of managing. Assists students in acquiring a more global understanding of the managerial task and becoming acquainted with the values and attitudes typically thought to be characteristics of the profession. In addition, introduction to the Executive M.B.A. Program curriculum.

EP295 Organizational Change and Development (8). Focuses on the process of organizational change and development. Emphasis on the rapidly growing body of knowledge and techniques concerned with ways in which organizations can better adapt to the challenges of a modern society with its changing values, new technologies, and increasing need for planned change.

EP296 Executive Leadership (7). Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis.

Teacher Education

Myron Simon Acting Director

- Curtis D. Abdouch, M.S. University of Omaha, *Lecturer* (science education)
- T. Jean Adenika, Ph.D. Florida State University, *Supervisor of Teacher Education* (health and science education)
- Kenneth P. Bailey, Ph.D. University of California, Los Angeles, *Senior Lecturer Emeritus in History and Education*
- Joan S. Bissell, Ed.D. Harvard University, *Assistant Director and Academic Coordinator* (learning theory, research and evaluation, educational policy)
- Carolyn L. Bouldin, M.A. Pepperdine University, *Coordinator of the Teacher Intern Program and Supervisor of Teacher Education* (elementary social science)
- Kimberly Burge, M.A. University of California, Los Angeles, *Lecturer* (applied technology)
- Linda Clinard, Ph.D. University of Michigan, *Lecturer* (reading)
- John A. Dunn, M.A. California State College, Los Angeles, *Supervisor of Teacher Education* (art, drama, dance)
- Dennis Evans, Ed.D. University of Southern California, *Lecturer* (administrative services credential)
- Ann P. Kaganoff, Ph.D. University of California, Santa Barbara, *Coordinator of Reading and Neurolinguistic Clinic and Academic Coordinator*
- Virginia Kelly, M.S. California State University, Fullerton, *Supervisor of Teacher Education* (special education)
- Katherine A. Kent, M.A. Arizona State University, *Lecturer* (special education)
- Robert E. Letro, M.A. California State College, Long Beach, *Supervisor of Teacher Education* (history and social science)
- Ann Lipscomb, M.S. California State University, Northridge, *Associate* (health education)
- Barbara C. Marshall, Ed.D. State University of New York at Buffalo, *Supervisor of Teacher Education* (English)
- Billie N. Masters, M.A. San Jose State University, *Supervisor of Teacher Education* (secondary reading; learning disabilities)
- Nick V. Messina, Ed.D. United States International University, *Supervisor of Teacher Education* (reading, mathematics)
- Susan M. Meyers, M.S. University of Wisconsin, *Supervisor of Teacher Education* (intern program)
- Rachael C. Mitchell, M.S. Pepperdine University, *Supervisor of Teacher Education* (reading specialist)
- Huberto Molina, Ph.D. University of California, Los Angeles, *Supervisor of Teacher Education* (bilingual education)
- Carol Booth Olson, Ph.D. University of California, Los Angeles, *Coordinator of Project Radius and Academic Coordinator* (composition)
- Rita W. Peterson, Ph.D. University of California, Berkeley, *Senior Lecturer in Education* (science education)
- Dennis E. Roberson, M.A. California State University, Long Beach, *Lecturer* (special education)
- Mary W. Roosevelt, National Froebel Foundation Teaching Degree, University of London, *Supervisor of Teacher Education* (elementary education)
- Myron Simon, Ed.D. University of Michigan, *Acting Director of Teacher Education and Professor of Education and English* (methods and philosophy of education)
- Russell M. Steinberg, Ph.D. University of California, Los Angeles; M.D. Medical College of Toledo, *Lecturer* (special education)
- Owen Thomas, Ph.D. University of California, Los Angeles, *Professor of Education, English, and Linguistics* (language arts)
- Yvonne L. Turner, Ed.D. University of Southern California, *Assistant Director of Admissions and Placement and Academic Coordinator* (curriculum and instruction)
- Donald R. Wheeler, Ed.D. University of Southern California, *Supervisor of Teacher Education* (administrative services credential)
- Eleanor P. Wynne, M.A. University of Washington, *Supervisor of Teacher Education* (early childhood and special education)
- Steven M. Zivolich, M.A. California State University, Los Angeles, *Lecturer* (special education)

The Office of Teacher Education is dedicated to a high level of academic scholarship in its professional programs and to excellence in the preparation of teachers and school administrators. The Office offers programs which lead to credentials required by those who teach or administer in the public and private schools of California.

Faculty associated with the Office of Teacher Education include distinguished scholars, researchers, and authors of national or international reputation. Most faculty have themselves taught or served as administrators in public or private schools, and all have shown commitment to the continued improvement of education through the processes of professional study, the development of new approaches to teaching, and the design or publication of innovative and scholarly courses of study.

The Office of Teacher Education is organized around the credential programs it offers. Faculty members generally are associated with the credential programs representing their areas of expertise and interest. The programs provide opportunities for interaction among students and faculty who share common interests.

The Office of Teacher Education also coordinates curricular outreach for the campus through Project Radius and operates a Reading-Neurolinguistic Clinic in collaboration with faculty from the College of Medicine. Project Radius and the Clinic are described below.

Project Radius

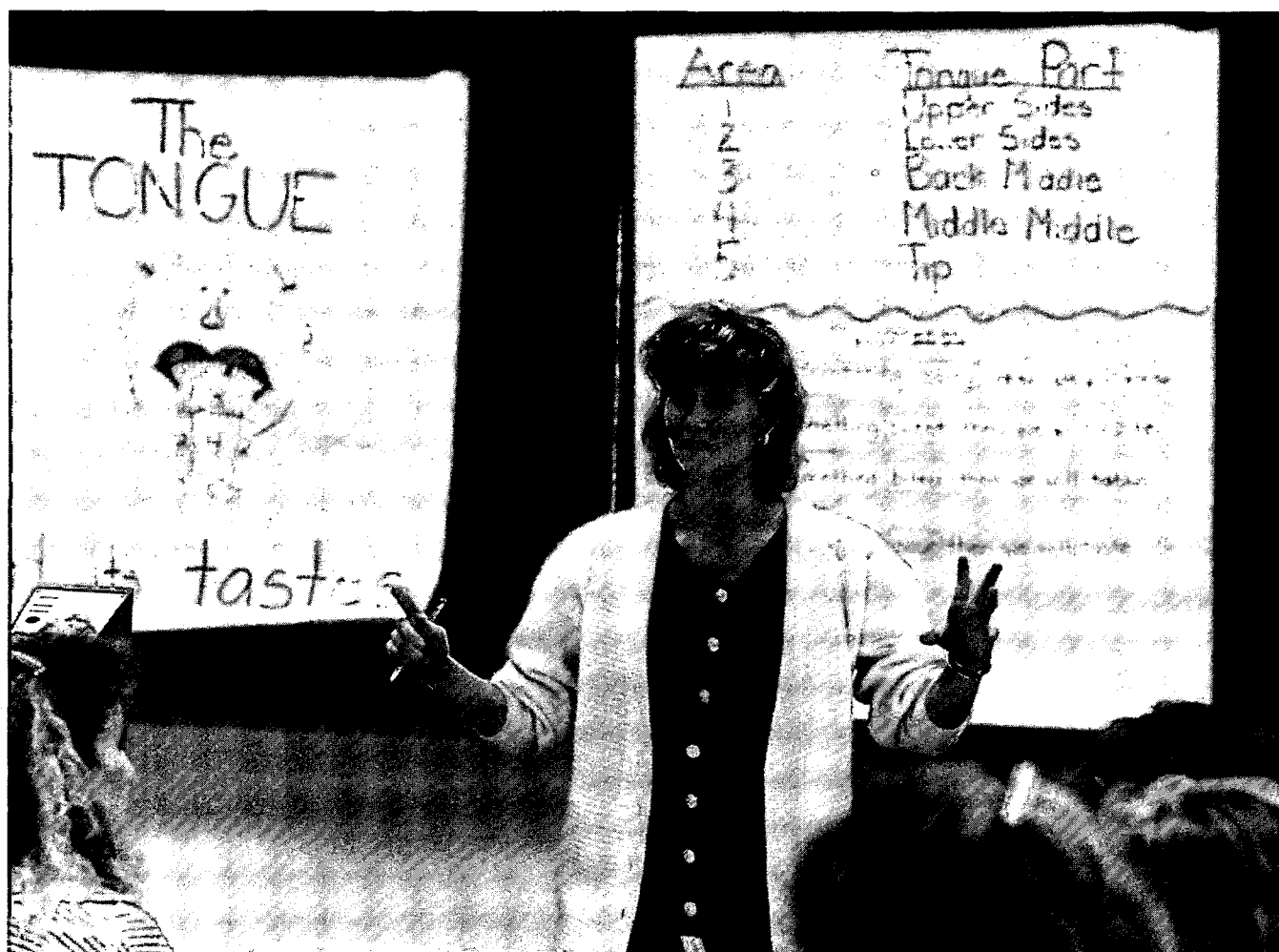
The purpose of Project Radius is to foster a climate of exchange and collegiality among administrators and faculty from UC Irvine and Orange County schools; to address issues, problems, and mutual concerns about curriculum, student preparation, and the professional development of teachers; and to work cooperatively to promote academic excellence at all levels of education. Coordinated by the Office of Teacher Education, Project Radius offers information and referral regarding various campus/school outreach activities and resources; conferences, workshops, courses, and summer institutes in specific curricular areas; assistance with curriculum review, design, and implementation; and cooperation with university/school-based fund-raising efforts.

Reading-Neurolinguistic Clinic

The Reading-Neurolinguistic Clinic has a mission which includes research, teaching, and community service. Clinic staff diagnose and treat students of all ages with moderate to severe learning disabilities. Credential candidates may attend seminars and discussions and observe advanced procedures for working with students who are in need of remedial instruction. The Clinic sponsors interdisciplinary research concerned with reading and neurolinguistic development.

Credential Programs

The Office of Teacher Education offers programs which lead to California teaching credentials as established by the Teacher Preparation and Licensing Law of 1970, known generally as the Ryan Act. In addition, a program leading to the Administrative Services Credential is offered. It is possible for a student concurrently to complete the requirements for a credential and to earn a graduate academic degree. This requires admission to the Teacher Education program and the graduate program in which the degree will be sought.



A Teacher Education student demonstrates the "hands-on" science teaching technique to classmates. The Office of Teacher Education offers programs that lead to credentials required by those who teach or administer in California public and private schools.



There are two basic teaching credentials in California: the Single Subject Credential and the Multiple Subject Credential. They are called basic because all other teaching and most nonteaching credentials have one of these two credentials as prerequisites.

Teaching credentials authorized by the 1970 credential law are not determined by grade level (i.e., elementary and secondary) but by the type of instructional situation (multiple or single subject). Each credential carries K-12 authorization. These credentials are awarded by the Commission on Teacher Credentialing upon recommendation of the UCI Office of Teacher Education and are required in order to teach or serve in a professional capacity in any public school in California.

Single Subject Instruction Credential

"Single subject instruction" means the practice of assigning teachers to specified subject matter courses, as is commonly practiced in California high schools and junior high schools. Teachers who are authorized for single subject instruction may be assigned, with their consent, to teach any subject in the authorized fields, at any grade level, but normally in a departmentalized secondary school. UCI is approved for this credential. Single Subject Instruction Credentials are authorized by the State of California in art, English, foreign languages, history, life science, mathematics, music, physical science, social science, as well as agriculture, business, government, health science, home economics, industrial arts, and physical education.

Candidates who enroll in the Single Subject Credential program at UCI generally are required to take the following courses: Education 101; Education 102A-H (students enroll in the section of their major); Education 105B; Education 105LB; Education 162 (usually taken after student teaching); Education 173; Education 174; Education 101L; Education 301; Education 320A-B-C-D-E; Education 360; Education 380.

Sample Fifth-Year Program—Single Subject Credential

Fall	Ed 101	Winter	Ed 173*	Spring	Ed 320C,D,E
	Ed 102		Ed 320A,B		Ed 301 or
	Ed 105B,LB		Ed 380		Ed 360
	Ed 174				
	Ed 101L				

*Ed 175 is recommended for students who have met the requirements for Ed 173 in other courses.

Multiple Subject Instruction Credential

"Multiple subject instruction" means the practice of assigning teachers to multiple subject matter instruction, as commonly practiced in California elementary schools. Teachers who are authorized for multiple subject instruction may be assigned, with their consent, to teach in any self-contained classroom: preschool, kindergarten, and grades 1-12 inclusive, but normally the assignment is in the elementary school. UCI is approved for this credential.

Candidates who enroll in the Multiple Subject Credential program at UCI generally are required to take the following courses: Education 105A; Education 105LA; Education 110A, 110B, 110C; Education 162 (usually taken after student teaching); Education 173; Education 174; Education 101L; Education 300A-B-C-D-E; Education 301; Education 360; and Education 380.

Sample Fifth-Year Program—Multiple Subject Credential

Fall	Ed 105A	Winter	Ed 105LA	Spring	Ed 110C
	Ed 110B		Ed 110A		Ed 300C,D,E
	Ed 173		Ed 101L		
	Ed 174		Ed 300A,B		

Candidates desiring both Single and Multiple Subject Credentials may apply the basic professional courses of Education 101L, 105A, 105LA, 162, 173, 174, 301, 360, and 380 toward both credentials, but must complete Education 101, 102, 110A, 110B, 110C; do student teaching in both areas; demonstrate competence by passing appropriate State-mandated subject examinations where needed; and pass the California Basic Educational Skills Test (CBEST).

Intern Teaching Credential Program

Through the intern program, a student may earn a stipend for one year of teaching while completing either the Multiple or Single Subject Credential. The stipend is paid by the school district. To serve as an intern in a school district, the student must be enrolled as a postbaccalaureate student in the Office of Teacher Education. Students should plan to interview for the intern program during the winter quarter, and seek admission to the Teacher Education program for the spring quarter to enroll in required courses before beginning their one-year internship. Intern candidates are selected by participating schools and the University based on the background and experience of the teacher candidate, the needs of the particular school, and the candidate's eligibility for the University's Teacher Education program. The number of internships varies from year to year. For further information see the intern secretary in the Office of Teacher Education.

Specialist Credentials

The Specialist Credential authorizes teaching in the specialization area at any grade level from preschool through grade 12. In order to qualify for specialist credentials, the applicant must have a valid basic teaching credential (either the Single Subject or Multiple Subject Credential) and complete a specialized program of professional preparation in an approved program. The State of California authorizes seven specialist credential categories: early childhood, bilingual/cross-cultural, mathematics, reading, agriculture, health science, and special education. UCI offers preparation for Specialist Credentials in the special education areas of the learning handicapped and the severely handicapped. Students interested in the details about Specialist Credentials should make an appointment for program counseling with the academic advisor in the Office of Teacher Education.

Special Education Specialist Credentials. UCI is approved for two areas of the Special Education Specialist Credential: Learning Handicapped and Severely Handicapped.

The Resource Specialist Certificate of Competence. The Resource Specialist Certificate of Competence requires possession of a valid Special Education Credential, and three or more years of teaching experience, including both regular and special education teaching experience. A clear Resource Specialist Certificate of Competence authorizes service only if a valid Special Education Credential, other than an emergency credential, is held concurrently. The UCI program leading to the clear Resource Specialist Certificate of Competence is a 16 quarter-unit program divided into four courses, and followed by an exit assessment.

Bilingual/Cross-Cultural Emphasis

The Bilingual/Cross-Cultural Emphasis is a specialization in addition to a regular teaching credential. This means that a candidate must fulfill all the necessary requirements for a basic teaching credential. The UCI program is limited to the development of a bilingual capacity in Spanish only as the second language in the Multiple Subject Credential Program.

At UCI the Department of Spanish and Portuguese offers a B.A. with a Bilingualism and English as a Second Language Emphasis. By acquiring this undergraduate major, the student will complete a significant part of the specific requirements for a Bilingual/Cross-Cultural Emphasis. This is the best kind of preparation for the program leading to a Bilingual/Cross-Cultural Emphasis. Entry and exit examinations are required for this program.

Services Credential

The Ryan Act provides for five categories of nonteaching credentials which authorize their holders to provide specific nonclassroom services to public schools. Services Credentials are issued by the State in pupil personnel services, administrative services, health services, library services, and clinical-rehabilitative services. UCI offers a program which leads to an Administrative Services Credential, generally required by school administrators. This credential is effective for grades K-12.

The Administrative Services Credential is a two-stage credential which requires completion of 36 quarter units for a Preliminary Administrative Services Credential and completion of an additional 36 quarter units for the Professional Administrative Services Credential. Prerequisites for the Preliminary Administrative Services Credential include a basic teaching credential, three years of acceptable full-time teaching experience, completion of Education 162 (or its equivalent), and a passing score on the California Basic Educational Skills Test. Applicants for the Professional Administrative Services Credential are required to have completed two years of administrative services under the preliminary credential. The Preliminary Credential is valid for five years while the candidate studies for the Professional Credential.

Planning a Program of Study

Any credential program can be completed with one year of full-time postbaccalaureate study, but it is possible for students to pursue a credential in their undergraduate program. All students interested in pursuing a credential should contact an academic counselor in Teacher Education.

The Office of Teacher Education program recommends two field experiences prior to entering the program. One such experience might be a tutoring assignment during the freshman or sophomore year and another might be serving as a teacher's aide in the junior year. Several options are available for course credit (Ed 100A, 100B, 100C) for this field experience. Such field experience programs may be cooperative arrangements between the University and the public school districts to help provide UCI students with experience that will prepare them for their future work as teachers. However, field experience can come from any of several public or private agencies which provide instruction so long as students work under the supervision of an experienced teacher. As a tutor, the college student usually works with the public school student on a one-to-one basis. As a teacher's aide, the student typically works for a block of time per week for one quarter with a teacher in the classroom. During this time, students are given a variety of opportunities to help the

experienced teacher enrich the course of study and to participate within the classroom. Ultimately it is in the classroom where the problems of teaching are either solved or ignored; hence here is where teacher preparation begins. This experience will assist the UCI student in making a more realistic career choice. It also involves the public school in the selection of future student teachers.

Preparation for Admission

California law requires that students (1) take the California Basic Educational Skills Test (CBEST) prior to applying for admission to Teacher Education and (2) successfully complete the National Teacher Examination (NTE) or four-fifths of an approved waiver program prior to beginning their student teaching (normally by the second quarter of enrollment).

Reservations to take both examinations must be made well in advance. Students are urged to contact the Office of Teacher Education for information about the tests and test dates six months before they plan to enter the program.

Admission to the Teacher Education Program

All students are welcome to apply for admission to the Teacher Education program. Students are usually admitted twice a year, in the fall and spring quarters. Information and an application for admission are available from the Office of Teacher Education, 422 Social Science Tower. Admission is based on a broad index:

Academic Achievement. Completion of a baccalaureate degree from an accredited institution and a grade point average of 3.0 will support consideration of admission to the Teacher Education program at UCI. (Undergraduates who enroll in courses leading to credentials still must be admitted to a fifth year of study—to be described later.) Two official transcripts from each college attended are required.

Absence of Criminal Conviction that Would Preclude the Issuance of a Credential. All students are required by law to obtain a Certificate of Clearance from the Commission on Teacher Credentialing prior to beginning student teaching. This process is primarily a fingerprint check to determine that the student is clear of criminal conviction. See a counselor in the Office of Teacher Education for advice on how to handle this process.

Interview. An Admissions Committee is available to meet with prospective students. All admitted to the program will have a personal interview with a member or members of the Committee.

Written Recommendations. Three letters of recommendation for admission are required. Such recommendations should indicate the student's ability to perform graduate-level work.

CBEST. Evidence of having taken the California Basic Educational Skills Test should accompany the application for admission.

Admission. Both the UCI academic department corresponding to the student's academic major and the Office of Teacher Education must recommend the admission of applicants for the Single Subject Instruction Credential. The applicant's record is reviewed first by the academic department and then by the Admissions Committee of the Office of Teacher Education. Admission is not automatic.

Minimum Requirements for the Basic Teaching Credential

The minimum requirements for the teaching credential in California are established by California state law. Requirements include:

1. A baccalaureate or higher degree, in an area other than professional education, from an approved institution.
2. A fifth-year approved program of professional preparation. This means a sequence of education courses, including an all-day, full-time assignment of a semester's duration (or the equivalent) in student teaching.
3. Passage of the National Teacher Exam or its waiver via an approved academic program. UCI academic programs are approved for most examination waivers; but students should seek counsel from Teacher Education to ensure that they are enrolled in an approved waiver program.
4. Under certain conditions the passage of the College Level Examination Program is required. See a counselor in the Office of Teacher Education for advice.
5. Demonstration of a knowledge of the various methods of teaching reading as validated by successful completion of a program of study. (Industrial arts, physical education, music, art, and home economics are exempt from this requirement.)
6. A course or an examination covering the U.S. Constitution.
7. A fifth year of study is still required, even though a student may elect to start or complete the approved program of professional preparation as an undergraduate.
8. Successful completion of the California Basic Educational Skills Test. Applicants are required to take this test prior to application for admission.
9. A grade point average of B or better in all required education courses.
10. A grade of B or better in all student teaching or required field experience.

The Approved Program of Professional Preparation

The "Approved Program" refers to the minimum number of education courses required for the teaching credential. UCI defines the approved program as consisting of core courses plus student teaching. Six quarter units of this instruction are required in the teaching of reading.

The Office of Teacher Education at UCI also offers a program for students who want more than the minimum requirements for teacher preparation. In addition to the minimum requirements for a Multiple Subject (elementary) credential, students are offered a UCI-recommended group of courses that provide candidates with special preparation in

writing and critical thinking, mathematics, science, computer applications, ESL methods, and fine arts. (See below.)

The UCI-recommended program, which includes the minimum requirements and 20 quarter units of special preparation, can be completed in five quarters, or a sequence of summer, fall, winter, spring, and summer.

Passage of a Subject Matter Examination

Single Subject Examinations. California requires all students to pass the National Teacher Examination (NTE) in the area of their teaching major prior to student teaching except where particular institutions have developed an approved major which waives the NTE. Students pursuing a waiver option must complete four-fifths of the waiver prior to student teaching. All UCI academic majors which are commonly taught in the public schools have been waived in lieu of the National Teacher Examination. However, there are certain requirements that a student must complete while fulfilling the major in order to receive this waiver. Students should consult a counselor in the Office of Teacher Education for detailed information.

Supplementary Authorization. Teaching minors by that name no longer exist, but it is possible to add further teaching authorizations beyond the single subject major. Students deciding to be credentialed in more than one subject area may qualify to do so in either of two ways:

1. Students may complete 30 quarter units (15 units if they are upper-division) in collegiate-level course work to develop a supplementary authorization to teach in areas differing from the single subject major. Consult a counselor in the Office of Teacher Education for details.
2. Students may pass the National Teacher Examination in any area of their choice and thus qualify for the additional authorization in that subject.

Multiple Subject Examinations. The National Teacher Examination General Knowledge section of the Core Battery is a requirement for the multiple subject credential. It includes the following areas: English, fine arts, mathematics, science, and social science. All students must pass the NTE prior to beginning student teaching or must complete at least four-fifths of a waiver program. The UCI program for the Multiple Subject Teaching Credential is approved for waiver of the examination if the student completes the required diversified program. The examination can be taken as often as necessary but should not be taken prior to the junior year.

Requirements for Waiver of the Multiple Subject National Teacher Examination. Of the student's total undergraduate program, 128 quarter hours are required to be divided as follows:

Nine courses (36 quarter units) in two of the following areas and seven courses (28 quarter units) in the other two:

- a. English (including grammar, literature, advanced composition, and speech)

UCI-Recommended Multiple Subject Program

Summer		Fall		Winter		Spring		Summer	
Ed 104E	(4)	Ed 105A	(4)	Ed 105LA	(2)	Ed 110C	(3)	Ed 104H	(4)
Ed 103A	(4)	Ed 110B	(3)	Ed 110A	(4)	Ed 300C-D-E	(12)	Ed 162	(4)
Ed 118	(4)	Ed 173	(4)	Ed 101L	(1.5)			Ed 301	(4)
Ed 309	(4)	Ed 174	(1)	Ed 300A-B	(8)			Ed 360	(3)
								Ed 380	(4)
Quarter Units 16		12		15.5		15		19	

- b. Social science and history (must have courses in each)
- c. Mathematics and science (must have courses in each with a minimum of three approved courses in mathematics)
- d. Fine arts, foreign language, and philosophy

Since the academic major on the UCI campus will normally fulfill one of the four areas above and the UCI breadth requirement applies to the others, meeting the four requirements is possible if planned early in the student's career.

Fifth-Year Requirement

The UCI Teacher Education program defines the fifth year as 45 quarter units of upper-division work taken after the bachelor's degree is granted, or postbaccalaureate-level work. In each instance the fifth year will consist of a program, individually determined and based upon the assessed needs of the student, and where applicable (for example, in the Intern Program), by the hiring school district.

Regardless of courses completed prior to the bachelor's degree, students must complete a fifth year to obtain a professional clear teaching credential. In addition to the approved program listed above for the Multiple or Single Subject Instruction Credentials, the fifth year must include the following:

1. Completion of 45 quarter units
2. Completion of the following courses:
 - a. Education 162, Psychology and Education of the Exceptional Child
 - b. Education 301, Classroom Applications of Computer Technologies
 - c. Education 360, Synthesis of the Professional Commitment
 - d. Education 380, Health Education for Teachers

Provision for a Student Teaching Experience

Student teaching is defined as a full-day, five-day-per-week assignment, for 18 weeks (or its equivalent) in the appropriate classroom training environment. Regular seminars are held as part of the total student teaching program. Evaluation is based on performance, excellence in instruction, and professional maturity, factors which are assessed by the resident teacher, the University supervisor, and the candidate. A grade of B or better is required in student teaching in order for a student to be recommended for a teaching credential.

If competence has been demonstrated by the conclusion of the student teaching program and all other requirements are met, the student qualifies for recommendation for credential certification by UCI.

Multiple Subject Instruction candidates are assigned to teach in grades K-8. The assignment is split to include two levels within this range. Student teaching for Multiple Subject candidates consists of assignments with increasing levels of responsibility in each assignment.

Single Subject Instruction candidates are assigned in grades 7-12. This assignment is split to include two levels within this range.

The student teaching situation requires the student to be in the school the full day for a full semester (or its equivalent), the same as is required of the regular teacher; student teaching experience includes faculty meetings, parent conferences, and sponsorship of events.

The intern teaching program, described earlier, provides another option for fulfilling student teaching requirements.

It is a joint responsibility of UCI and the school districts to guarantee that each student will have student teaching experience in a multi- or cross-cultural situation.

Clearances for student teaching are processed by the Office of Teacher Education and are contingent upon the Certificate of Clearance, a current health clearance, academic preparation clearances, and successful completion of either the National Teacher Examination (NTE) or four-fifths of an approved waiver program. A student must apply for a student teaching assignment the quarter before student teaching. Students are to consult the Office of Teacher Education for appropriate information.

Preliminary, Professional Clear, and Life Credentials

Multiple and Single Subject Credentials are of three types:

The Preliminary Credential. The Preliminary Credential is awarded by the State upon completion of the baccalaureate, the professional education sequence, a course in the teaching of reading, student teaching, completion of the Introduction to Educational Technology requirement, a course or examination covering the U.S. Constitution, a passing score on the California Basic Educational Skills Test, and by passing the National Teacher Examination or completing an approved waiver as required by the Ryan Act.

Under the present program, a student can be authorized to teach in California prior to the completion of the fifth year. However, the fifth year must be completed within five years after the preliminary credential is issued.

A certificate of completion is awarded to students satisfactorily completing requirements for a credential.

The Professional Clear Credential. The Professional Clear Credential cannot be awarded by the State until the completion of (a) a baccalaureate degree, (b) an approved program, and (c) a fifth year.

The Life Credential. The Life Credential is no longer awarded in California. Professional Clear Credential holders will be required to meet professional growth requirements as a condition for renewing this credential.

Courses

100A Educational Strategies for Tutoring (4) F. On-the-job training as a tutor in public school. Emphasis on cognitive learning. Opportunities exist to work with the bilingual and bicultural child. Pass/Not Pass only.

100B Educational Strategies for Teacher Aiding (4) W. Emphasizes strategies for assisting public school teachers with general classroom procedures. Opportunities exist to work with the bilingual and bicultural child. Pass/Not Pass only.

100C Cross-Age Helping Techniques (4) S. Develops instructional strategies and resources which can be used in effective cross-age and cross-cultural tutoring. Opportunities exist to work with the bilingual and bicultural child. Pass/Not Pass only.

101 Secondary School Curriculum and Organization (4) F, S, Summer. Historical and current practices in curriculum concepts and procedures.

101L Introduction to Educational Technology (1.5) F, W, S, Summer. Overview of issues and techniques in classroom uses of computer-based and media technologies: implications of educational technologies and related professional responsibilities; instruction in operations, terminology, and capabilities of computer, audio, video, and instructional television hardware, software, and system components. Pass/Not Pass only.

102 Methods of Teaching in the Secondary School (4) F, Summer. All sections of 102 are normally completed in the fifth year. Scope and sequence in the instructional program in general and in the student's major. Observing and participating in the secondary classroom required. Course is to be taken immediately prior to supervised teaching.

102A Methods of Teaching Foreign Languages in the Secondary Schools (4) F, S. Prerequisites: senior standing as a foreign language major and some training in linguistics, or consent of instructor.

102B Methods of Teaching History and the Social Sciences in the Secondary Schools (4) F, S. Methods and teaching strategies used in developing instructional programs in social science.

102C Methods of Teaching English in the Secondary Schools (4) F, S. Scope, sequence, and methods in teaching English and related areas in secondary schools of California. Includes articulation problems in English programs; methods and strategies for teaching writing, literature, and speech.

102D Methods of Teaching Music in the Secondary Schools (4) F. Basic concepts of music education. Teaching strategies for performance-oriented curriculum and humanities approaches.

102E Methods of Teaching Art in the Secondary Schools (4) F, S. Teaching strategies in the high school arts and crafts programs: skills appropriate to the high school student.

102F Methods of Teaching Mathematics in the Secondary Schools (4) F, S. Teaching strategies in high school mathematics programs. Emphasis on new mathematics.

102G Methods of Teaching Science (4) F, S. Teaching strategies in high school physical and biological science programs. Emphasis on the inquiry approaches to science.

102H Methods of Teaching the Bilingual Child (4) Summer. Individual development of potentialities of the bilingual child. Appropriate teaching strategies; examination of resources and materials, particularly from content areas, applicable to the teaching of the bilingual child.

103A-B-C Mathematics for Elementary Education (4-4-4) Summer. (Meets certification requirements for the multiple subject teaching credential in the State of California.) Fundamental ideas of logic and set theory. Basic arithmetic properties of the real number system. Geometry in two and three dimensions. Topics in elementary number theory, probability, and statistics.

104E Methods of Teaching Art in the Elementary Schools (4) F, W, S, Summer. Theory and understanding of teaching strategies in elementary school arts and crafts programs. Work on developing skills appropriate for use in the elementary classroom.

104H Methods of Teaching English as a Second Language (4) Summer. Understanding of the building blocks of English and Spanish, including psychological phenomena brought into play when the second language is encountered.

105A Curriculum and Methods for Elementary School Reading (4) F, W, S, Summer. The teaching of reading in elementary schools. Theories and principles related to teaching reading and reading activities; teaching word recognition, phonics, comprehension, study skills, content area reading, literary appreciation; and other major approaches to reading instruction.

105LA Diagnostic-Prescriptive Reading Instruction (2) F, W, S, Summer. Presents formal and informal diagnostic procedures for assessing the reading strengths and weaknesses of students. Focuses on assisting the classroom teacher in organizing, analyzing, interpreting, and using diagnostic information for prescriptive teaching.

105B Reading in the Secondary Schools (4) F, W, S, Summer. Reading in the content areas. Attention to remediation in areas of word attack skills, comprehension, content clues, and decoding.

105LB Curriculum and Methods in Reading Laboratory, Secondary (2) F, W, S, Summer. Laboratory program in the public schools taken concurrently with Education 105B. Working in reading laboratories and classroom situations, putting into immediate practice the processes learned in Education 105B. Laboratory work includes a bicultural experience.

106A Education of the Preschool Child (4) F. Theoretical and practical analyses of schooling the preschool child. Curriculum development, teaching strategies, review of principal concepts and research concerning processes of learning; critical, productive, and creative thinking.

106B Administration and Supervision of ECE Programs (4) W. Designing and directing Early Childhood Education programs. Methods and techniques of management within differing ECE programs. Proposals, curriculum development, policies and procedures, budget planning, and legal responsibilities.

106C Curriculum and Methods in Elementary Education: Early Childhood Education (4) S. Diagnostic and prescriptive teaching, competency-based learning, continuous flow curriculum, continuous progress, inquiry teaching, parent and aide implementation, individualization, assessment and evaluation, and multicultural planning.

106E Child Development I: Infancy and Early Childhood (4) F, Summer. Research, theory, current controversies, trends, and techniques for study of the child and the family unit within the community setting.

106F Child Development II: Middle and Late Childhood; Preadolescent Development (4) W, Summer. Emphasis on the family and community setting. Theory, current research, and techniques for working with this age group.

106G Child Development III: Adolescence and Early Adulthood (4) S, Summer. Selected topics in individual and social behavior of the adolescent and early adult. Research, current studies, and theories applicable.

106H-I-J Practicum in Early Childhood Education (4-4-4) F, W, S, Summer. Supervised school laboratory experience in schools serving young children. Directed teaching in child development laboratories, nursery schools, day care schools, and similar approved facilities.

107 Children's Literature (4) W, Summer. History of all types of children's literature, major authors, and illustrators. Includes methods for promoting children's interest in literature and the effect of different sociocultural backgrounds on children's motivation.

110A Strategies for the Development of Communication and Thinking Skills for the Elementary Child (4) F, W, S, Summer. Models of teaching of inquiry (social science), spelling, creative writing, language arts, music, art, and drama.

110B Teaching Mathematics in Elementary School (3) F, W, S, Summer. Scope, sequence, and methods of teaching mathematics at all levels of elementary school. Presented through lectures, discussions, demonstrations, and exploration of a variety of materials. Covers how to plan lessons, motivate students, diagnose difficulties, and evaluate learning in mathematics.

110C Teaching Science in Elementary School (3) F, W, S, Summer. Prospective elementary teachers learn how to teach science in grades K-8. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations.

111 Art and Crafts for Teachers (4) W, Summer. Objectives and procedures for teaching visual arts in elementary and secondary schools; includes experiences with art projects appropriate for child development, with emphasis on two- and three-dimensional products.

114 Science Education Teacher Apprentice Field Experience (4-4) F, W, S. On-the-job experience as a science teacher apprentice. Students assist public school classroom teachers in laboratory demonstrations and experiments, tutoring individuals or small groups. Pass/Not Pass only.

115A-B Reading in the Curriculum: Advanced (4-4) Summer. Tutorial and laboratory-oriented program aimed to prepare teachers for the Miller-Unruh Reading Specialist examinations and for advanced work for other students.

117 Children's Center Experimental Program (4) Summer. Elementary School Experimental Program. For students seeking to develop a career in education. Work with elementary grade pupils in individual and group situations.

118 Writing and Critical Thinking (4) W, Summer. Introduces teachers to the concept of writing as a process. Practice in prewriting, precomposing, writing, sharing, revising, editing, and evaluation in the four domains of writing: sensory/descriptive, imaginative/narrative, practical/informative, and analytical/expository. Special emphasis on fostering critical thinking skills through writing. Lecture, demonstration, small group interaction and individualized instruction. (Presented by teacher/consultants from the UCI Writing Project.) Recommended as a prerequisite to Education 110A.

140A Methods for Elementary Bilingual Teachers (4) F. Direct observation of bilingual classrooms in local elementary schools, classroom lectures, discussions, and presentations on the culture and language of the bilingual student. Same as Spanish 100B.

140B Methods for Secondary Teachers of Spanish (4) W. Communicative approaches to teaching Spanish at the secondary school level. Theory and practice of oral proficiency acquisition techniques. Required field observations. Emphasis placed on training differences for native vs. nonnative Spanish speakers. Prerequisite: consent of instructor. Same as Spanish 115.

140C Methods of Teaching English as a Second Language (4) S. Methods and materials for teaching English to speakers of Spanish. Includes methodology for teaching children, adolescents, and adults. Field experience required. Recommended: Linguistics 50 or Social Sciences 3 and Linguistics 140 or Social Sciences 142G. Same as Spanish 114 and Linguistics 160.

155 Developmental and Learning Disabilities: Genetic, Ethical, and Legal Issues (4) S, Summer. This course covers patterns of inheritance and genetic issues. It will include the ethics of working with persons with disabilities, the normalization of the disabled, developmental assessment, and ages 0-6 parent/child relationships.

157 Survey of Physical Disabilities (4) F, Summer. Physically pathological conditions in pupils and their educational implications. Physical, intellectual, social, and emotional characteristics of exceptional pupils; learning disabilities in relation to genetic, physiological, psychological, and social conditions.

158 Educational Implications and Methods for the Physically Handicapped (4) W, Summer. Educational methods and materials to meet the needs of pupils with limitations resulting from physical handicaps. Competency in assessment of physical, intellectual, social, and emotional characteristics of exceptional pupils; utilization of systematic observation, academic assessment, clinical teaching.

159 Communication Sciences with the Physically Handicapped (4) S, Summer. Language acquisition and development for the physically handicapped, fundamentals of braille, signing, and communication boards.

160 Learning Disabilities: Medical and Biological Dimensions (4) F, Summer. Analysis of research regarding the exceptional child, including commonalities and differences: physical and psychiatric aspects of mental retardation; instructional modifications based on the factors.

161 Learning Disabilities in the Schools (4) F, W, S, Summer. Definition and nature of learning disabilities, means of recognition, diagnosis, and remediation of learning disabilities.

162 Psychology and Education of the Exceptional Child (4) F, W, S, Summer. Nature, degree, and incidence of conditions which differentiate children deviating from normal physical, neurological, mental, and psychological patterns. Emphasis on State laws in relation to identification and education of exceptional children. Development and effective use of individualized processes and strategies.

163 Educational Planning for the Exceptional Child (4) W, Summer. Organization of classes for exceptional children including resources and mainstreaming. Emphasis on dynamics of pupil-teacher, teacher-parent, and pupil-pupil relationships. Ethical practices in communication to others about individual pupils.

164A Diagnosis and Prescription for the Learning Handicapped (4) W, Summer. Diagnosis of learning problems and remedial procedures; individualized prescriptive learning activities; analysis and evaluation of all program elements. Current issues and trends, and use of research findings in program implementation.

164B Advanced Assessment and Diagnostic Techniques (4) F. Assessment and diagnostic techniques used to implement California's Master Plan. Includes diagnostic/prescriptive practices, observation, record keeping, text evaluation, ability to assess teacher behavior on the learner, and interaction with a variety of classroom management systems. Includes 10 hours of field experience.

165 Educational and Vocational Implications of the Learning Handicapped (4) S, Summer. Educational, social, economic, and vocational implications of mental retardation and physical handicaps; current programs, services, and legal aspects; counseling exceptional pupils and their parents.

166 Educational Implications of Behavior Disorders (4) Summer. Remediation with behavior disorders of pupils. Emphasis on individual and classroom strategies including behavior modification. Motivational and attitudinal differences including but not limited to self-control, anxiety, and general attitudes toward learning.

167 Education of the Trainable Mentally Retarded and the Severely Multiple Handicapped (4). Application of developmental and learning characteristics of the trainable mentally retarded and the multiple handicapped to educational curriculum, total communication skills, planning, and materials.

168 Severely Emotionally Disturbed and Autistic Pupils in the Schools (4). Programming for severely emotionally disturbed and autistic pupils including diagnosing individual needs, prescribing learning activities, preparing and organizing materials, and evaluating outcomes. Systematic observation, assessment, and clinical teaching.

169 Educational and Vocational Implications of Being Severely Handicapped (4) Summer. Educational, social, economic, and vocational problems of the severely handicapped; current programs, services, and legal aspects; counseling of severely handicapped students and their parents.

170 History of Education (4) Summer. Educational experiences in this country with special reference to educational issues and problems.

172 Sociological Foundations of Education (4) Summer. Influence of social structure in schools, school systems; American cultural values and their influence on education; emphasis on problems of ethnically and culturally different students in schools.

173 Learning Theory and Classroom Practices (4) F, W, S, Summer. Includes learning theories, motivation, alternate management systems for learning environments, teaching behaviors, diagnosis, prescriptions, instruction treatment, evaluation, interpersonal relations, motivational skills. Letter grade only.

174 Learning Theory and Classroom Practices Laboratory (1) F, W, S, Summer. Laboratory course concurrent with Education 173. Takes place in a community setting of a bicultural nature.

175 Foundations of Education (4) W, Summer. Historical, sociological, philosophical, and psychological aspects of education, including learning theories. Letter grade only.

176A-B-C Theoretical Models of Exceptionality (4-4-4) F, W, S. Reviews the theoretical models pertaining to exceptionality and the issues surrounding the categories of exceptionality. Theories presented in both the historical and present perspectives, with respect to psychological, medical, and sociological theories.

179 Advanced Composition for Teachers (4) Summer. Principles of formal composition and problems of teaching. Selecting handbooks and ancillary reading, marking papers, making assignments, and conducting workshops and tutorials. Same as English and Comparative Literature WR179.

180 Special Topics: Curriculum and Methods (4) F, W, S, Summer. Advanced course tutorial in nature. Assumes the student has already completed some phase of curriculum work, either elementary or secondary.

182 Health and Wellness (3) F, W, S. Personal health and wellness, highlighting nutrition, diet, eating disorders, fitness, cardiovascular health, cancer, common illness, sexually transmitted disease, birth control, and stress. Cardiopulmonary resuscitation or first aid is required.

182J Health Education Counseling: Advanced (3) F. Provides training by health care professionals. Topics include birth control, sexually transmitted disease, stress, common illness, cancer, heart disease, nutrition, conditioning, first aid, cardiopulmonary resuscitation (CPR), and workshop presentations. CPR and first aid are required. Prerequisites: must have been selected a Peer Health Advisor the previous spring; consent of instructor.

182K Practicum in Health Education Counseling: Advanced (3) W. Advanced laboratory and seminar class sessions meeting weekly on health education and preventive health care. Health education

workshops presented to campus living groups, clubs, and organizations on relevant health concerns of students. Prerequisites: Education 187J. Open only to Peer Health Advisors.

182L Practicum in Health Education Counseling: Advanced (3) S. Advanced laboratory field experience in presenting health education workshops to student groups. Participation in weekly seminars on current issues in health education and preventive health care. Prerequisites: Education 182J, 182K. Open only to Peer Health Advisors.

183 Elementary Curriculum K-8 (4) F, W, S, Summer. Content, articulation, and expected competencies in the elementary school. The State frameworks, public school curriculum, theories, principles, and background for operational techniques for public school curriculum planning and development are studied.

184A Directed Field Experiences (4) S, Summer. Required for admission to the Teacher Intern Program. Assignment in public schools, working with children of varied ethnic and racial backgrounds, noting education as a bridge between cultures.

184B Directed Field Experience with Exceptional Children (4) F, W, S, Summer. Observation and participation plus laboratory activities in on-site school situations, encompassing a variety of experiences with varied types of exceptional students and students with differing racial and ethnic backgrounds.

185 The Sociology of Urban Education (4) F, W, S, Summer. Emerging issues including diversification, racial balance, equity education, White flight, community control, the city-suburban connection, involvement of the disadvantaged in decision making, biological differences, and race-related behavior.

186A Staff Development and Inservice Practices (4) Summer. Addresses process as well as content for planning staff development programs. Training in specific communication and instructional skills. Opportunities to design, implement, and evaluate inservice programs. Includes 10 hours of field experience.

186B Administrative, Legal, and Systems Change Analysis and the Resource Specialist (4) Summer. Develops dynamics of relationship between the Resource Specialist and changes in educational systems. Macro view of the Resource Specialist in group process, administrative decision making, community relations, leadership skills, organizational theory, interpersonal communication skills, all in the framework of legal mandates. Includes 10 hours of field experience.

187 The Psychology of Individualized Instruction (2-4) F, W, S. Effectiveness of tutors/teachers in their interaction with undergraduate students in the one-to-one and group/class setting. Emphasis on techniques for the facilitation of independent learning by students. Various techniques of diagnosis and delivery. Pass/Not Pass only.

188 Health Science Experience (1-4) F, W, S. Students serve in a health care facility on campus or off after being screened and accepted by instructor; trained to provide assistance to medical staff; medical skills and knowledge acquired; completion of cardiopulmonary resuscitation or first aid is required. Prerequisite: consent of instructor after interview and screening. Pass/Not Pass only.

189 Counseling Theory and Procedure: Organization and Services (4) Summer. Function of counseling; role of the counselor; operation of pupil personnel services; testing, measurement, and use of test data; parent conferences and career counseling.

191 Experimentation in Media of Communication and Instruction (4) F, W, S, Summer. Media resources, techniques, and new teaching strategies in students' respective fields. Includes printed materials, audio and visual materials, programmed materials, educational technology, and organized systems of learning.

197 Individually Arranged Field Study (4) F, W, S, Summer. Planned program for students with sufficient background to undertake the field study under direction of a faculty member who has competence in the area.

198 Directed Course Study on Special Topics (4) F, W, S, Summer. Program of laboratory experiences in the public schools set up and conducted for persons in advanced levels of teacher preparation.

199 Individual Study (1-4 per quarter) F, W, S, Summer. Intensified advanced study in areas in which a student has considerable background, under the direction of a faculty member who has competence in the area.

300A-B-C-D-E-F Supervised Teaching in the Elementary School: Multiple Subject Instruction Credential (4-4-4-4-4-4) F, W, S, Summer. Full-time student teaching assignment for a semester's duration. Graded "IP." Prerequisite: Professional Program in Education.

301 Classroom Applications of Computer Technology (4) F, W, S, Summer. Classroom applications of computer-based technologies as tools to enhance student's thinking skills, for instruction in subject areas and at the grade levels in which they will teach, and as utility/management programs. Prerequisite: Education 101L or equivalent.

301C Instruction in Computer-Based Technology and Classroom Usage (5) F, W, S, Summer. Classroom uses of computer-based technologies. Includes study of hardware and software systems and components. Emphasizes computer-based technologies as tools to enhance student thinking skills, for instruction in subject areas at proper grade levels, and in management programs.

302 Multicultural Education and Today's Educational Goals (4) S, Summer. Introduction of issues in public education concerning equity. Examines the negative effects of historical and current bias on students as a result of race, color, national origin, religion, sex. Students learn to translate knowledge gained into attitudes, skills, and techniques to result in positive learning experiences for all students. Prerequisite: junior or senior standing.

303 Science in Elementary and Junior High Schools (4) Summer. Provides content, methods, and materials to revitalize elementary and junior high school science programs. Includes demonstrations and practice using variety of methods; analysis of barriers to teaching science; techniques to overcome fear of science; application of research on learning, instruction, and achievement.

304 Mathematics for Junior High School Teachers (4) Summer. Provides content and methods to revitalize junior high school mathematics programs. Includes demonstrations and practice using a variety of methods and materials; analysis of learning difficulties in mathematics; strategies to overcome fear of math; application of research on learning, instruction, and achievement.

305A Educating the Gifted Learner I (4) F, Summer. Introduction to education for gifted learners: rationale for gifted programs, misconceptions surrounding gifted learners, methods of identification, theories of intelligence, legislative guidelines, program options, and effective ways to work with parents and administrators. Visitations and speakers.

305B Educating the Gifted Learner II (4) W, Summer. Case studies of a variety of gifted learners including elementary and secondary students. Development of individual plans for gifted learners including assessment, curriculum, teaching strategies, communication with parents, supplemental resources, and evaluation of learning. Visitations and guest speakers.

305C Educating the Gifted Learner III (4) S, Summer. Development of programs that serve gifted populations. Focuses on both pro-

grams and curricula for gifted students who are integrated into regular classrooms, and programs for gifted students in special classrooms or schools; planning at school rather than classroom level.

308 Natural Science Activities for Teachers of Spanish-Speaking Students (3) S. Designed for elementary teachers. Introduces teachers to a series of natural science activities which can be readily used in the classroom and on school grounds. Activities are highly integrated with other classroom disciplines including social studies, art, reading, writing, and physics. Emphasis on Spanish-language materials; English translations available.

309 Science and Society (4) W, Summer. Introduces elementary teachers to the world of science. Through lectures, nontechnical reading and discussions, provides understanding of basic concepts in environmental/human biology and earth/planetary/physical sciences.

310A-B-C-D-E-F-G-H-I Intern Teaching in the Elementary School: Multiple Subject Instruction (4-4-4-4-4-4-4-4-4) F, W, S. Must be a contract teacher with a school district and must be enrolled as a postbaccalaureate student at the University. Prerequisite: Professional Program in Education

320A-B-C-D-E-F Supervised Teaching in the Secondary School: Single Subject Instruction Credential (4-4-4-4-4-4) F, W, S, Summer. Full-time student teaching assignment for a semester's duration. Graded "IP." Prerequisite: Professional Program in Education.

330A-B-C-D-E-F-G-H-I Intern Teaching in the Secondary School: Single Subject Instruction (4-4-4-4-4-4-4-4-4) F, W, S. Must be a contract teacher with a school district and enrolled as a postbaccalaureate student at the University. Prerequisite: Professional Program in Education.

341A-B-C Supervised Counseling Experience (4-4-4) F, W, S, Summer. Application of counseling techniques, both individual and group, through supervised field experience under observation. Supervision and weekly seminar. 180 clock hours required. Prerequisite: core counseling courses.

342A-B-C Supervised Field Experience: Learning Handicapped (4-4-4) F, W, S, Summer. Full-time student teaching assignment for a quarter's duration in appropriate special education setting. Includes weekly seminar.

343A-B-C Supervised Field Experience: Physically Handicapped (4-4-4) F, W, S, Summer. Full-time student teaching assignment for a quarter's duration in appropriate program with physically handicapped students. Includes weekly seminar.

344A-B-C Supervised Field Experience: Severely Handicapped (4-4-4) F, W, S, Summer. Full-time student teaching assignment for a quarter's duration in appropriate program with severely handicapped students. Includes weekly seminar.

350 Supervision of Classroom Teaching (4) Summer. Lecture-laboratory. Role of the supervisor in advancing teacher skills in guidance of the classroom learning process; skills in supervision. Prerequisite: admission to Administrative Services Credential Program.

351 Consultation, Coordination, and Collaboration Skills for the Resource Specialist (4) S, Summer. Development of consultative strategies and services, assessment techniques, problem-solving skills; correlation of curriculum, materials, and schedules; activities of special education and the regular classroom, develop ability to work with school assessment team processes. Includes 10 hours of field experience. Must have basic teaching credential and Special Education credential and have taught for a minimum of two years.

353 Techniques of Personnel Administration (4) S, Summer. Theories, principles, policies, and practices relative to personnel management, including current research, affirmative action, professional negotiations, conflict resolution, working conditions, employment contracts, recruitment, selection, assignment, reduction in force, dismissal, supervision, and evaluation. Prerequisite: admission to Administrative Services Credential program and completion of 36 postbaccalaureate units and teaching credential.

354 Governance, Organization, and Administration of Public Schools (4) F, Summer. Political, social, and economic forces affecting public school systems. Concepts of authority, power, and influence. Federal, State, and County mandates and policies, funding requirements, court decisions and other influences, including school boards, administrators, unions, professional organizations and pressure groups. Prerequisite: admission to Administrative Services Credential program and completion of 36 postbaccalaureate units and teaching credentials.

355 School Management in a Community Setting (4) W, Summer. School management, problem solving, decision making. Role of staff, community (including minorities) in assessing needs, establishing and implementing goals. Management of support systems, internal and external communications. Application of information technology. Conflict resolution, stress management, school site councils, community relations. Prerequisite: admission to Administrative Services Credential program and completion of 36 postbaccalaureate units and teaching credential.

360 Synthesis of the Professional Commitment (3) S, Summer. Responsibilities, rights, processes, professional ethics, and commitments of the teaching profession. Includes professional associations, legal rights and responsibilities of teachers, and laws and court cases relative to teaching.

370A-B-C Supervised Teaching in Bilingual Education, Elementary (4-4-4) F, W, S. Full-time student teaching assignment for a quarter's duration (or equivalent). Prerequisites: Education 300A-B-C; postbaccalaureate students only.

370D-E-F Supervised Teaching in Bilingual Education, Secondary (4-4-4) F, W, S. Full-time student teaching assignment for a quarter's duration (or equivalent). Prerequisites: Education 320A-B-C; postbaccalaureate students only.

371 Organizational Theory, Planning, and Application (4) F, W, S, Summer. Basic theory and function of human organizations as dependent and independent social entities. Concepts for understanding and managing the dynamics of group behavior and human relations. Structuring and leading groups in a variety of organizational settings including school boards, staff, parent and community groups, regional and State organizations. Prerequisite: Preliminary Administrative Services Credential.

372 Instructional Leadership (4) F, W, S, Summer. Management strategies designed to achieve established goals and objectives; learning theory, instructional research, human relations and group dynamics. Identification of strategies to meet diverse pupil needs in conjunction with educational trends and issues and the emerging needs of society. Curriculum improvement and practices. Application of computer technology to instructional practices. Prerequisite: Preliminary Administrative Services Credential.

373 Evaluation (2) F, W, S, Summer. Evaluation techniques and strategies designed to provide accurate data pertaining to teacher effectiveness, pupil achievement, staff performance and the measurement of program and curriculum effectiveness. Identification of conditions that result in high or low level pupil learning outcomes. Effective means to compare classroom, school district goals to outcomes. Prerequisite: Preliminary Administrative Services Credential.

374 Professional and Staff Development (2) F, W, S, Summer. Strategies for developing staff development programs. Application of knowledge, management skills and instructional strategies associated with adult learners. Means of integrating organizational goals and programs for adult learning performance. Alternative approaches to enhance professional and staff development, time constraints and financing staff development programs. Prerequisite: Preliminary Administrative Services Credential.

375 School Law and Political Relations (2) F, W, S, Summer. Legal framework of schools and public education. Political jurisdictions affecting educational policy. Influence of legal aspects to educational control. Political and sociological forces directly and indirectly affecting school practices. Theory of individual and group dynamics in achieving compromise, consensus and coalitions to achieve educational goals. Prerequisite: Preliminary Administrative Services Credential.

376 Fiscal Management (2) F, W, S, Summer. Organizations and management of financial and business operations. Funding sources and problems affecting financing at State and local levels. Business office operations, utilizations of personnel, budget preparation, financial management strategies and control, analysis of financial effects of contractual obligations. Identification of appropriate computer technology. Prerequisite: Preliminary Administrative Services Credential.

377 Management of Human and Material Resources (2) F, W, S, Summer. Concepts, theories and application for the development and management of human resources. Effective staff utilization patterns in consideration of personnel competencies, organizational constraints and available resources. Emerging considerations in developing and implementing effective personnel policies. Short- and long-term planning for filling personnel needs and needs for buildings, equipment, and supplies. Prerequisite: Preliminary Administrative Services Credential.

378 Cultural and Socioeconomic Diversity (2) F, W, S, Summer. Contemporary issues of cultural and socioeconomic diversity in public education. Ethnic, racial and religious composition of the State and local community. Concepts of cultural values and language diversity. Programs and procedures for meeting instructional needs of limited English proficient pupils. Principles and procedures for involving the family in school activities and in reaching educational objectives. Prerequisite: Preliminary Administrative Services Credential.

379 U.S. Government for Teachers (4) W, Summer. Covers teaching about the background of American democracy, the Declaration of Independence, and the U.S. Constitution—its amendments and its operation. Structure of local, State, and U.S. government. Fulfills State requirement for teaching credentials.

380 Health Education for Teachers (4) W, Summer. State requirements for teachers in the area of health education. Includes drug use and misuse, alcohol, tobacco, nutrition, health care systems, life cycle study, "wellness," and consumer education in health.

390 Curriculum Design and Management in Public Schools (4) F, W, S, Summer. Historical and contemporary principles for curriculum development. Basis for making curriculum decision; theories, principles, and operational techniques for curriculum planning. Human growth and development. Strategies and development of educational programs, including mandated programs, multicultural and socioeconomic considerations, evaluation, and staff development.

391 Educational Leadership (4) S, Summer. Theories of leadership, organizational behavior, communications, and shared decision making. Requirements for success in planning, managing, developing, and evaluating educational programs. Role of the leader in group contexts. Development of a positive school climate. Prerequisite: admission to Administrative Services Credential program and completion of 36 postbaccalaureate units and teaching credential.

392 Accountability and Finance in Public Education (4) S, Summer. Economics, politics, and principles of school finance. Historical development, legal requirements, current issues. Sources and basis of revenue. Financial planning, budgeting, expenditure programs, purchasing, maintenance and operations, contracts, district and site level funding. Other functions associated with business management. Prerequisite: admission to Administrative Services Credential program and completion of 36 postbaccalaureate units and teaching credential.

394 Guidance Services for Facilitating Human Development (4) Summer. Applying knowledge of human behavior; theories of learning and development; current available remedial and developmental techniques; special programs; counseling techniques; ethical principles of the profession.

395 Counseling Skills for Facilitating Human Development (4), Summer. Develop understanding of individual differences; development of individual potential and competencies through knowledge of and ability to apply acceptable individual and group counseling techniques to promote positive attitudes toward self and others.

396 Assessment Techniques (4) Summer. Develops ability to give and interpret standardized group and individual assessment techniques. Theories and techniques to understand affective, cognitive, and behavioral characteristics of both typical and atypical children.

397A-B-C Supervised and Administrative Field Work (4-4-4) F, W, S. A field experience in administration or supervision in the public school. The school district, student, and UCI jointly plan the work experience, its supervision, and accompanying academic work. Prerequisite: two years of teaching experience.

397D-E-F Professional Field Experience (4-4-4) F, W, S, Summer. Theory and practice in a school setting under the supervision of a practicing school administrator. Opportunity to apply and refine knowledge and skills in areas of primary interest or need in the educational domains specified for this credential. Prerequisite: Preliminary Administrative Services Credential.

398 Career Development (4) Summer. Occupational and career education trends, information, and theories. Approaches of theories to definition of the client's problem, techniques, and desired outcomes. Measurement instruments and computer-based approaches.

399 Individual Study (1-4) F, W, S, Summer. Intensified advanced study in required areas of Administrative Services Credential program. Educational research seminars will be included. Restricted to students in advanced credential programs, e.g., Administrative Services.

College of Medicine

Walter L. Henry, M.D. **Dean**

Bruce M. Achauer, M.D. Baylor College of Medicine, *Associate Adjunct Professor of Surgery (Plastic)*

Theresa A. Adams, M.D. Pennsylvania State University, *Clinical Instructor of Anesthesiology*

Phyllis F. Agran, M.D. University of California, Irvine, and M.P.H. Harvard University, *Associate Professor of Pediatrics*

Chang-Beom Ahn, Ph.D. Korea Advanced Institute of Science, *Assistant Adjunct Professor of Radiological Sciences*

Abdelmadjid Aissi, Ph.D. Georgia Institute of Technology, *Assistant Adjunct Professor of Radiological Sciences*

Byron J. Allen, M.D. University of California, Los Angeles, *Assistant Adjunct Professor of Medicine (Cardiology)*

Navinchandra M. Amin, M.B., B.S. Grant Medical Center, Bombay (India), *Associate Adjunct Professor of Family Medicine*

Anne-Line J. Anderson, M.S. University of Southern California, *Associate Clinical Professor of Radiological Sciences*

Cynthia T. Anderson, M.D. University of Tennessee, *Associate Clinical Professor of Anesthesiology*

Janet A. Anderson, Ph.D. Case Western Reserve University School of Medicine, *Associate Adjunct Professor of Ophthalmology*

Brian S. Andrews, M.B., B.S. University of New South Wales (Australia), *Professor of Medicine (Rheumatology)*

Orm Aniline, M.D. Wayne State University, and Ph.D. Yale University, *Assistant Adjunct Professor of Psychiatry and Human Behavior*

Hoda Anton-Culver, Ph.D. St. Andrews University (Scotland), *Associate Professor of Community and Environmental Medicine*

Sanford Anzel, M.D. New York Medical College, *Clinical Professor of Surgery (Orthopedics)*

Stuart M. Arfin, Ph.D. Albert Einstein College of Medicine, *Professor of Biological Chemistry and Biological Sciences*

Steven A. Armentrout, M.D. University of Chicago, *Professor of Medicine (Hematology)*

Edward R. Arquilla, M.D., Ph.D. Case Western Reserve University School of Medicine, *Professor of Pathology*

Ricardo H. Asch, M.D. University of Buenos Aires (Argentina), *Professor of Obstetrics and Gynecology in Residence (Reproductive Endocrinology and Infertility)*

Rajkumari V. Asrani, M.B., B.S. Madras Medical College (India), *Associate Clinical Professor of Anesthesiology, and Obstetrics and Gynecology*

Tamerou Asrat, M.D. University of California, Irvine, *Clinical Instructor of Obstetrics and Gynecology*

Michael Babiak, M.D. University of Calgary (Canada) *Assistant Clinical Professor of Anesthesiology*

Robert A. Baird, M.D. State University of New York, *Associate Adjunct Professor of Surgery (Orthopedics)*

Kenneth M. Baldwin, Ph.D. University of Iowa, *Acting Department Chair and Professor of Physiology and Biophysics and Professor of Biological Sciences and Community and Environmental Medicine*

Jose P. Balmaceda, M.D. Catholic University Medical School (Chile), *Associate Professor of Obstetrics and Gynecology in Residence (Reproductive Endocrinology and Infertility)*

Philippe Baneux, D.V.M. State University (Ghent) *Academic Administrator*

James L. Banks, M.D. Eastern Virginia Medical College, *Assistant Adjunct Professor of Pediatrics*

Yvon Baribeau, M.D. University of Montreal, *Clinical Instructor of Surgery*

Michael E. Barish, Ph.D. Stanford University, *Assistant Professor of Physiology in Residence*

Steven J. Barker, M.D. University of Miami, and Ph.D. California Institute of Technology, *Associate Professor of Anesthesiology*

Ronald J. Barr, M.D. Johns Hopkins Medical School, *Professor of Dermatology*

Cyril H. Barton, M.D. University of Colorado Medical School, *Associate Professor of Medicine (Nephrology)*

James D. Belluzzi, Ph.D. University of Chicago, *Associate Adjunct Professor of Pharmacology*

Theodore V. Benderev, M.D. University of Maryland School of Medicine, *Assistant Clinical Professor of Surgery (Urology)*

Alfred E. Bent, M.D. Dalhousie University (Nova Scotia, Canada), *Assistant Professor of Obstetrics and Gynecology in Residence (Gynecologic Urology)*

Anthony V. Beran, B.A. Dubrovnik College, *Adjunct Professor of Pediatrics*

Richard Berg, M.D. University of Health Sciences, Chicago Medical School, *Clinical Instructor of Radiological Sciences*

J. Edward Berk, M.D. Jefferson Medical College, D.Sc. University of Pennsylvania, *Assistant Dean, UCI College of Medicine, and Professor Emeritus of Medicine (Gastroenterology)*

Michael L. Berman, M.D. George Washington School of Medicine, *Associate Professor of Obstetrics and Gynecology (Oncology)*

Monique A. Berman, Ph.D. Upstate Medical Center, State University of New York, *Associate Adjunct Professor of Medicine (Rheumatology)*

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Matthew Bessen, M.D. University of Health Sciences, Chicago Medical School, *Assistant Clinical Professor of Medicine (Cardiology)*

Deepak K. Bhalla, Ph.D. Howard University, *Associate Adjunct Professor of Community and Environmental Medicine*

Arnold Binder, Ph.D. Stanford University, *Professor of Social Ecology and Psychiatry and Human Behavior*

Isabel M. Birnbaum, Ph.D. University of California, Berkeley, *Professor of Social Sciences and Psychiatry and Human Behavior*

Paul R. Blair, M.D. University of Guadalajara (Mexico), *Assistant Clinical Professor of Psychiatry and Human Behavior*

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Floyd E. Bloom, M.D. Washington University School of Medicine, *Adjunct Professor of Psychiatry and Human Behavior and Pharmacology*

Stephen Bloomfield, M.D. Rutgers Medical School, *Clinical Instructor of Surgery*

Ausma S. Blumentals, M.D. University of Minnesota, *Clinical Professor of Medicine (Endocrinology)*

Maureen E. Bocian, M.D. University of Illinois, *Associate Professor of Clinical Pediatrics*

Stephen C. Bondy, Ph.D. University of Birmingham (England), *Professor of Community and Environmental Medicine*

Michael H. Bonnet, Ph.D. University of Florida, *Associate Adjunct Professor of Medicine (Pulmonary)*

W. Benton Boone, M.D. Meharry Medical College School of Medicine, *Associate Adjunct Professor of Ophthalmology*

Warren L. Bostick, M.D. University of California, San Francisco, *Professor Emeritus of Pathology*

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Ralph Bradshaw, Ph.D. Duke University, *Department Chair and Professor of Biological Chemistry and Professor of Biological Sciences*

Yolanda C. Brady, M.D. Texas Tech University, *Assistant Clinical Professor of Medicine (Primary Care)*

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Jeffrey Brandon, M.D. Jefferson Medical College, *Assistant Adjunct Professor of Radiological Sciences*

Philip Braunstein, M.B., B.S. King's College (England), *Chief of Nuclear Medicine and Professor of Radiological Sciences*

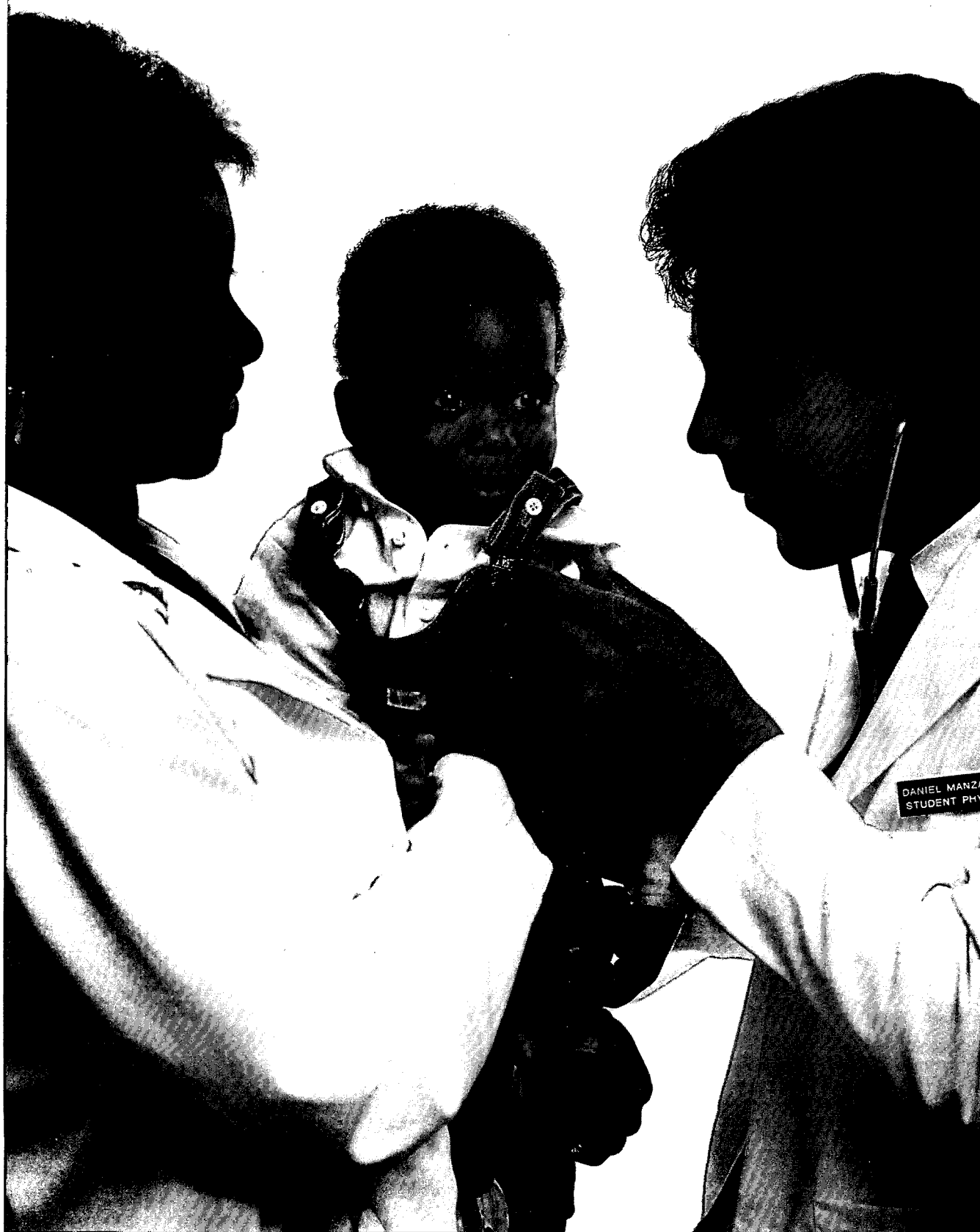
Gary L. Bravo, M.D. University of California, Irvine, *Clinical Instructor of Psychiatry and Human Behavior*

Matthew Brenner, M.D. University of California, San Diego, *Assistant Professor of Medicine in Residence (Pulmonary)*

Richard J. Bridges, Ph.D. Cornell University, *Assistant Professor of Neurology in Residence*

Michael A. Brodsky, M.D. University of Illinois, *Assistant Professor of Medicine in Residence (Cardiology)*

Marianne E. Bronner-Fraser, Ph.D. The Johns Hopkins University, *Assistant Professor of Physiology and Biophysics and Biological Sciences*



The College of Medicine has one of the largest training programs for primary care physicians in the United States, and its clinical programs in burns, cancer, diabetes, heart disease, psychiatry, obstetrics, infectious disease, perinatology, and trauma are recognized across the country.

- Scott D. Brunner, M.D. University of California, Irvine, *Clinical Instructor of Family Medicine*
- Monte S. Buchsbaum, M.D. University of California, San Francisco, *Professor of Psychiatry and Human Behavior and of Social Sciences*
- Richard E. Buller, M.D., Ph.D. Baylor University, *Clinical Instructor of Obstetrics and Gynecology (Oncology)*
- William E. Bunney, Jr., M.D. University of Pennsylvania, *Department Chair and UCI Distinguished Professor of Psychiatry and Human Behavior, and Professor of Pharmacology and Psychobiology*
- Michael J. Burns, M.D. University of California, Irvine, *Associate Clinical Professor of Medicine (Emergency Medicine)*
- Neal L. Burstein, Ph.D. Stanford University, *Associate Adjunct Professor of Ophthalmology*
- Richard Buxton, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Radiological Sciences in Residence*
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- Sharon P. Wilczynski, M.D. Pennsylvania Medical College; Ph.D., University of California, Los Angeles, *Assistant Adjunct Professor of Pathology*
- Alan G. Wile, M.D. University of Michigan, *Associate Professor of Surgery (General)*
- James Hutchison Williams, M.D. Ohio State University, *Associate Dean of the College of Medicine and Clinical Professor of Obstetrics and Gynecology*
- James H. Williams, Jr., M.D. Harvard University, *Assistant Professor of Medicine (Pulmonary)*
- Archie F. Wilson, M.D. University of California, San Francisco, Ph.D. University of California, Los Angeles, *Chief of Pulmonary Disease and Professor of Medicine (Pulmonary), Physiology and Biophysics, and Biological Sciences*
- Richard H. Wilson, Ph.D. Northwestern University, *Associate Professor of Surgery in Residence (Otolaryngology)*
- William J. Wilson, M.D. University of Missouri, *Adjunct Professor of Radiological Sciences*
- Robert L. Winer, M.D. Case Western Reserve University, *Associate Adjunct Professor of Medicine (Nephrology/Renal)*
- Rodney M. Wishnow, M.D. Washington University School of Medicine, *Associate Professor of Medicine (Infectious Diseases) and Microbiology and Molecular Genetics in Residence*
- Anne B. Wong, M.D. University of Pennsylvania Medical School, *Assistant Clinical Professor of Anesthesiology*
- David H. Wong, M.D. University of California, Irvine; Pharm.D. University of Southern California, *Assistant Clinical Professor of Anesthesiology*
- Edward K. Wong, Jr., M.D. University of Southern California, *Associate Professor of Ophthalmology*
- Nathan D. Wong, Ph.D. Yale University, *Assistant Adjunct Professor of Medicine (Cardiology)*
- Joseph Chong-Sang Wu, M.D. University of California, Irvine, *Assistant Adjunct Professor of Psychiatry and Human Behavior*
- Sing-Yung Wu, M.D. The Johns Hopkins University, Ph.D. University of Washington, *Associate Professor of Radiological Sciences in Residence*
- Raymond B. Wuerker, M.D. The Johns Hopkins University, *Associate Professor of Pathology and Anatomy in Residence*
- Frederic A. Wyle, M.D. University of Pennsylvania Medical School, *Vice Chair, Department of Medicine and Adjunct Professor of Medicine (Infectious Diseases)*
- Billy Yee, M.D. University of California, Davis, *Assistant Professor of Obstetrics and Gynecology*
- Ronald F. Young, M.D. State University of New York, *Chief of Neurosurgery and Professor of Surgery (Neurological)*
- Shookooh Yousefi, Ph.D. Medical College of Virginia, *Assistant Adjunct Professor of Medicine (Nephrology)*
- Albert Cheng-Te Yu, M.D. National Taiwan University (Taiwan), Ph.D. University of Pittsburgh, *Assistant Adjunct Professor of Radiological Sciences*
- Jen Yu, M.D. National Taiwan University (Taiwan), Ph.D. University of Pennsylvania, *Department Chair and Professor of Physical Medicine and Rehabilitation*
- Karin E. Zenk, Pharm.D. University of Southern California, *Associate Adjunct Professor of Pediatrics*
- Mark I. Zetin, M.D. University of California, Irvine, *Associate Adjunct Professor of Psychiatry and Human Behavior*

The UCI College of Medicine became part of the University of California in 1965. Prior to this time it was known as the California College of Medicine, a private institution founded in 1896. The College is dedicated to advancing the knowledge and practice of medicine for the benefit of society. This mission is being achieved through the accomplishment of the following complementary and synergistic objectives:

Scholarly research of the highest quality to further the understanding of human biology and the diagnosis, treatment, and prevention of disease.

Education of physicians who meet the highest standards of professional competence and achievement.

Development of scholars in the clinical and basic sciences who will assume leadership roles in medical practice, education, and research.

Provision of high-quality medical care to patients through the UCI Clinical Services System that will serve as a model of excellence.

Dissemination of the results of advances in medical research and practice.

Health Sciences Complex

The medical school facilities comprise a 121-acre site which has been designated the Health Sciences Complex. Twenty-nine acres have been developed to provide space for teaching, research, and patient care as well as offices for departmental administration.

The College's basic science instructional programs are located in modern, well-equipped, medical sciences buildings. These units provide space for first- and second-year classes, lecture halls, offices and laboratories for various basic and clinical departments, and a student center. Other buildings house the College's administration, laboratories, and the Biomedical Sciences Library.

In addition, faculty from the Departments of Pharmacology, Biological Chemistry, and Psychiatry and Human Behavior, and the University of California Southern Occupational Health Center share laboratory space with corporate researchers in a building adjacent to the College. This facility also houses the headquarters of the Nelson Research and Development Company, a private pharmaceutical development research firm, which is a subsidiary of the Ethyl Corporation.

Comprehensive outpatient services are available on campus through the UCI Medical Plaza and the Beckman Laser Institute and Medical Clinic. Housing one of the world's leading programs in medical laser technology, the Beckman Laser Clinic offers state-of-the-art treatment for cancer of the head, neck, and female reproductive system and for cardiovascular disease.

The UCI Medical Plaza capitalizes upon the broad range of diagnostic and therapeutic programs of the College as well as the extensive clinical expertise of the faculty. The facility offers services in a variety of specialties, including internal medicine, obstetrics and gynecology, pediatrics, dermatology, ophthalmology, cardiology, orthopedics, gastroenterology, and neurology. Special programs in diabetes, multiple sclerosis, and inflammatory bowel diseases also are available. Also located in the Plaza is the Lon V. Smith Eye Clinic, which offers the latest in diagnostic health care for eye diseases, including computerized refraction analysis, glaucoma diagnosis, and ultrasound analysis of eye disorders.

Clinical Services System

Medical services offered by the College are provided through the UCI Clinical Services System. This System is comprised of the UCI Medical Center (UCIMC) in Orange, one community clinic in Santa Ana, another clinic in Anaheim, and numerous affiliated hospitals and clinics located in Orange, Los Angeles, San Bernardino, and Kern Counties. It incorporates the talents and broad range of medical expertise of more than 400 full-time clinical faculty of the College as well as approximately 1,700 community physicians who serve as voluntary faculty.

The purposes of the UCI Clinical Services System are to serve the community and to maintain an environment of excellence in medical education and research. At the UCI Medical Center, the College offers students and residents a full range of clinical education and research activities, from primary care to the most technical subspecialties. The community clinics offer primary, continuity-of-care medicine, and the College's affiliated hospitals and clinics round out the educational program. Together, these facilities offer opportunities for clinical training in specific specialties and exposure to a wide range of patient populations for more than 600 resident physicians, 184 third- and fourth-year medical students, and numerous allied health and nursing students.

As major providers of medical care, the institutions of the UCI Clinical Services System play a critical role in meeting the health care needs of four Southern California counties. The College has one of the largest training programs for primary care physicians in the United States, and its clinical programs in burns, cancer, diabetes, heart disease, psychiatry, obstetrics, infectious disease, perinatology, and trauma are recognized across the country.

UCI Medical Center

The University of California Irvine Medical Center (UCIMC), located in the City of Orange, is a 493-bed, comprehensive medical care center. It is the principal clinical facility of the College of Medicine operated by the University. The medical faculty of the College of Medicine, together with the medical resident-physician staff, provide the professional care at the Medical Center. Services are provided in medicine, surgery, obstetrics and gynecology, pediatrics, psychiatry, family medicine, dermatology, pathology, radiology, physical medicine and rehabilitation, ophthalmology, neurology, and anesthesiology. The Medical Center also has cardiac, pediatric, neonatal, respiratory, burn, and medical-surgical intensive care units, and more than 90 specialty outpatient clinics. The Medical Center is the designated countywide Level I tertiary trauma referral center.

A major capital improvement program at the Medical Center includes the construction of new intensive care units for medical, surgical, and cardiac patients. In addition, the lobby, pathology laboratories, and general medical floors are being upgraded. The construction of a 92-bed psychiatric hospital to replace the existing psychiatric facility also is planned. The UCI Medical Pavilion, a companion facility to the UCI Medical Plaza on campus, expands the availability of faculty patient care. The pavilion will house the interim cancer center while construction begins on a 54,000-square foot facility for comprehensive outpatient cancer care. Upon completion in 1990, the center will encompass all of the basic and clinical subspecialties involved in adult and pediatric oncology, including specialized medical, nursing, and ancillary care necessary to diagnose and manage patients with cancer.

UCI-Community Clinic of Orange County

The Community Clinic of Orange County (CCOC) is located in the City of Santa Ana and is the home of the Refugee Preventive Health Service Program and the Urban Health Initiative Program which are overseen by the Department of Family Medicine. CCOC provides training for medical students in their primary care rotations as well as for first-, second-, and third-year Family Medicine residents. CCOC provides care for approximately 35,000 outpatient visits annually.

UCI-North Orange County Community Clinic

The North Orange County Community Clinic (NOCCC) is located in the City of Anaheim and provides training programs for resident physicians in primary care, general internal medicine, and general and adolescent pediatrics. There are additional programs in gynecology, dermatology, general surgery, podiatry, neurology, optometry, orthopedics, and a multispecialty faculty practice. NOCCC provides training for medical students in their primary care, general pediatric, adolescent medicine, and geriatric medicine rotations and electives. The Clinic provides care for more than 20,000 outpatient visits annually.

Affiliated Hospitals and Clinics

Additional major teaching and research programs of the College of Medicine are conducted at the Veterans Administration Medical Center, Long Beach, and at Memorial Medical Center (Long Beach). Other academic programs are conducted in affiliation with San Bernardino County Medical Center, Fairview Developmental Center (Costa Mesa), Kaiser Foundation Hospital (Bellflower and Canyon General), Children's Hospital of Los Angeles, Children's Hospital of Orange County, Metropolitan State Hospital (Norwalk), St. Joseph Hospital (Orange), St. Jude Hospital and Rehabilitation Center (Yorba Linda), The City of Hope Medical Center (Duarte), Rancho Los Amigos Hospital (Downey), Capistrano by the Sea Hospital (San Juan Capistrano), Western Medical Center (Tustin), the Kern Medical Center (Bakersfield), and the Clínica Sierra Vista (Lamont), Hoag Memorial Hospital Presbyterian (Newport Beach), Lanterman Developmental Center (Pomona), and the Orange County Department of Education (Costa Mesa).

Admission to the M.D. Program

The College of Medicine is a member of the American Medical College Application Service (AMCAS). All students who seek entrance to medical school must first apply to AMCAS. Requests for applications should be submitted directly to:

The American Medical College Application Service
1776 Massachusetts Avenue, N.W., Suite 301
Washington, D.C. 20036

Applications may be submitted between June 15 and November 1 of the year preceding anticipated admission. Students who wish to apply to the College of Medicine should designate it on their AMCAS application form, and AMCAS will forward the application to the College.

Last year, the College received approximately 3,000 applications from AMCAS. From these, some 500 candidates were granted interviews, and 92 students were enrolled in the first-year class beginning in September.

Applications received by the College are reviewed by an Admissions Committee composed of faculty, medical students, and members of the local community.

After initial screening, selected applicants are requested to submit additional materials which include letters of recommendation, supplemental information forms, two photographs, and a nonrefundable application fee of \$35. Additional information should not be submitted unless requested.

In addition to scholastic achievement, attributes deemed desirable in prospective students include indications of leadership ability and participation in extracurricular activities (e.g., research and medically related experiences as well as community involvement). Utilizing the AMCAS application and the letters of recommendation, the Admissions Committee looks for qualities considered valuable in a physician. These qualities include the intellectual and emotional capacity to provide comprehensive and continuing medical care, the ability to cope with disease and guide patients through the complex array of medical services, the commitment to remain sensitive to individual needs, and the dedication to strive for the advancement of the art, science, and practice of medicine long after obtaining a medical degree.

Applicants may expect to receive notification about their admission status from the College any time from October until the beginning of the following fall term. The Admissions Committee maintains a list of alternative candidates for possible acceptance should a vacancy occur before the end of the first week of classes. Accepted applicants must return a written statement of their acceptance of the College's offer within two weeks after receipt of the notice of acceptance. No advance deposit to hold a position in the class is required of applicants. Students who are accepted sign a Statement of Intent to Register, but (in keeping with the recommendations of the Association of American Medical Colleges) are free to withdraw prior to enrollment if their medical school or career choice changes.

Because the University of California is a State-assisted institution, preference is given to California residents who are U.S. citizens or permanent residents of the United States. The College does, however, participate in the student exchange program of the Western Interstate Commission for Higher Education (WICHE). Under this program, qualified legal residents of certain Western states without medical schools (Alaska, Idaho, Montana, and Wyoming) are considered along with California residents. The states of origin reimburse the State of California for the educational costs of students who are accepted.

To be eligible for this program, students must apply to WICHE certifying officers in their own states. For addresses of certifying officers, write to:

Western Interstate Commission for Higher Education
P.O. Drawer P
Boulder, CO 80302

Requirements for Admission

First-year students may enter only in September of each year. Candidates for admission to the College of Medicine must meet the following requirements:

1. Completion of a minimum of three full years of undergraduate work with a superior scholarship record. This work must total not less than 90 semester units or an equivalent number of quarter units that are acceptable for a bachelor's degree credit in an accredited institution of higher education. Candidates for admission may submit community college credit only to the extent granted on transfer to a four-year college or university. For purposes of scholarship evaluation, letter or numerical grades are preferred for course work, particularly for the required

subjects listed below. Final enrollment into the first-year class at the College of Medicine is contingent upon evidence of satisfactory completion of all requirements and all courses listed as "in progress" on the AMCAS application. Failure to meet requirements or falsification of information are grounds for rejection or dismissal.

2. Completion of the following college course requirements prior to matriculation:

	Semester Units	Quarter Units
One year of general chemistry	8	12
One year of organic chemistry	8	12
One year of physics	8	12
One and one-half years of	12	18
biology and/or zoology (Note: these courses must include one year of lower-division biology and/or zoology plus a half-year of upper-division courses excluding botany and biochemistry)		
One quarter of college-level calculus	2.7	4

Premedical students are advised to take advantage of the intellectual maturation afforded by a well-rounded liberal arts education. The study of English, the humanities, and the social and behavioral sciences are considered particularly important. The following courses are also recommended but not required: genetics, vertebrate embryology, physical chemistry, and Spanish.

3. Candidates must attain satisfactory scores on the New Medical College Admission Test (MCAT). An officially certified test score taken within three years of applying must be received by the College's Admissions Office before the candidate's application can be considered. The oldest test scores that will be considered for students applying to the 1990-91 entering class are those resulting from either the spring or fall 1986 MCAT. The most recent test scores that will be considered are those from the fall 1989 testing. Inquiries regarding the MCAT should be addressed to:

The New Medical College Admissions Test
The American College Testing Program
 P.O. Box 414
 Iowa City, IA 52240

Medical Student Advising Personnel

Basic Science Faculty Advisors

Kenneth M. Baldwin, Professor of Physiology and Biophysics and Biological Sciences	D-352 MS I	856-7192
Robert Blanks, Associate Professor of Anatomy and Neurobiology, Surgery, and Biological Sciences	B106 MS I	856-5984
Hoda Anton-Culver, Associate Professor of Community and Environmental Medicine	367 MSR II	856-7416
Kenneth H. Ibsen, Associate Professor of Biological Chemistry and Biological Sciences	D-250 MS I	856-6756
Frances M. Leslie, Assistant Professor of Pharmacology	306 MSR II	856-5437
Ralph E. Purdy, Associate Professor of Pharmacology	350C MSR II	856-7433

Clinical Faculty Advisors

To be assigned during the second year in order to assist with issues of the third and fourth years of medical school.

Student and Curricular Affairs Advisors

J. Hutchison Williams, M.D., Associate Dean	125 MSR I	856-6196
Laurel Bartenstein, Director Curricular Affairs	E-120 MS I	856-5282
Burt Winer, Counselor and Director of Student Development	377 MS II	856-5076
Eileen Muñoz, Coordinator, Summer Programs	125 MSR I	856-4603
Elizabeth Parker, Director Office of Admissions	E-112 MS I	856-4618
James Miles, Assistant Director, Financial Aid Coordinator	125 MSR I	856-4605
Penny Utley, Student Affairs Officer, UCIMC	Bldg. 22A UCIMC	634-5176
Bermia Bush, Recruitment and Admissions Counselor	E-112 MS I	856-5387

Medical Scientist Program

Exceptionally well-qualified students interested in careers in academic medicine and with demonstrated research accomplishments may be admitted to the Medical Scientist Program. Students in this program pursue a combined curriculum leading to an M.D. degree from the College of Medicine and a Ph.D. degree from the School of Biological Sciences. A minimum of seven years is required to complete the Program. Students holding either degree are not eligible for the Program. Additional information is available from the Medical Scientist Program Office of Student and Curricular Affairs, (714) 856-4610.

Applicants for this program must submit separate applications to both the College of Medicine and the Medical Scientist Program. The separate application forms can be requested from the Office of Admissions, College of Medicine. If accepted into the program, students will be expected to choose a specific graduate department before the start of the academic year in which they enter the program. Applicants may also write to the department they wish to join for graduate admission requirements. Financial support in the form of a fellowship is available to a limited number of students in the program. Applicants not accepted into the Medical Scientist Program may be considered separately for admission to the College of Medicine.

Application forms are available from:

Office of Admissions
E112 Medical Sciences I Building
College of Medicine
University of California
Irvine, CA 92717
(714) 856-5388

Admission to Advanced Standing

Currently there are no positions available in the advanced standing/transfer program. However, there are occasional opportunities for students to be considered for transfer into the College. For further information, students should contact the College's Admissions Office.

Admissions Information

All inquiries regarding admissions programs and procedures of the College of Medicine should be directed to:

Office of Admissions
E112 Medical Sciences I Building
College of Medicine
University of California
Irvine, CA 92717
(714) 856-5388

Fifth Pathway Program

The Fifth Pathway Program is a year of supervised clinical training that is open to U.S. citizens who have attended foreign medical schools and have successfully completed all of the formal requirements for graduation except the internship or social service requirement. In addition, prospective students must have performed premedical work in a U.S.-accredited college or university. The program at the College of Medicine, conducted in cooperation with Memorial Hospital Medical Center (MHMC), Long Beach, is considered a special postgraduate course of the MHMC-UCI Center for Health Education. It is funded separately from regular education programs and is operated on a fee basis. Admission is on a competitive basis. The continuation of this program is subject to annual reevaluation.

The program includes a 10-month core curriculum of medicine, surgery, psychiatry, obstetrics and gynecology, pediatrics, and a surgical subspecialty, with an additional two months for electives. A published research paper/case report or an acceptable short thesis is required for completion of the program. Upon successful completion of this closely supervised clinical year and with approval of the California State Board of Medical Quality Assurance, the trainee is eligible to enter residency programs.

Interested students should contact:

Office of the Associate Dean for Hospital Affairs
University of California, Irvine
200 South Manchester Avenue, Suite 820
Orange, CA 92668
(714) 634-6490

The M.D. Curriculum

The M.D. curriculum requires four years to complete. If special needs are identified, the time may be extended to five years.

The first and second years are scheduled on a modified quarter system. There is a 10-week vacation period between the first and second years; students may use that time for elective or research work in place of vacation. Between the second and third years is a four-week vacation, the last week of which the National Board Examination Part I will be administered. During the fourth year up to 12 weeks of vacation is allowed.

The first year includes gross anatomy and embryology, histology, biochemistry, physiology, neuroanatomy, behavioral sciences I, and microbiology. The second year includes pathology, clinical pathology, pharmacology, behavioral sciences II, examination of the patient, preventive medicine, studies of the mechanisms of disease, and an introduction to the clerkships.

The third and fourth years are spent in clerkships in medicine, pediatrics, obstetrics and gynecology, surgery, anesthesiology, ophthalmology, psychiatry and human behavior, physical medicine and rehabilitation, neurosciences, primary

care, and radiology. Students are also provided ample opportunity to participate in clinical and research elective courses of their choosing.

To satisfy the requirements for the M.D. degree, each medical student must successfully complete the full curriculum (basic science, preclinical, clinical, and elective course work) with at least a 2.0 grade point average, and fulfill the National Board Examination requirement. After the second year, all students are required to pass Part I of the National Board Examination before continuing their clinical clerkships. Students must also pass Part II of the Boards prior to graduation. In accordance with National Board Examination rules, the examination may be taken a maximum of three times.

Curricular Policies

The curricular policies of the College of Medicine are the responsibility of faculty committees. A listing of these policies is contained in the *Medical Student Handbook*, which is available from the Office of Student and Curricular Affairs and is distributed along with other policy statements to all students upon matriculation.

The grading system at the College utilizes letter grades A through F.

Further Information

Further information regarding registration, rules and regulations, grading procedures, requirements for academic advancement, and other facts is provided in the *Medical Student Handbook*, which is given by the Office of Curricular Affairs to all students upon matriculation to the College.

The *UCI College of Medicine Announcement* contains general administrative and academic information as well as descriptions of the medical curriculum. The *Announcement* can be purchased for \$4. Checks should be made payable to "UC Regents," and requests should be sent to:

Office of Admissions
E112 Medical Sciences I Building
UCI College of Medicine
University of California
Irvine, CA 92717
(714) 856-5388

Curricular Description

First Year: Basic Sciences

No more than six hours of instruction are scheduled per day; of these six hours, no more than four are formal lectures.

Gross Anatomy and Embryology; Histology; Neuroanatomy

The language of medicine is taught in human gross anatomy, embryology, histology, and human neuroanatomy. Gross anatomy is taught through a regional approach with heavy emphasis on laboratory dissection augmented by lectures, demonstrations (radiographic films), and teaching aids. It includes a detailed consideration of the embryology of human development from the union of sperm and ovum to parturition. Histology is designed to provide students with knowledge of subcellular and cellular morphology and function in preparation for studies in pathology. Organizational principles regarding how cells are combined to form tissue and how tissues combine to form organs provide a basis for studies of normal function and pathological disturbances. Neuroanatomy is experimentally oriented and consists of laboratory and lecture material, along with clinical discussions. Courses are open only to medical students and graduate students required to take any or all of these courses.

Biochemistry

Students may choose between two courses in biochemistry. One course provides a general overview of classical biochemistry and molecular biology, including the structure and function of proteins, enzymology, metabolic pathways and their regulation, protein biosynthesis, and the molecular mechanisms responsible for regulation at the transcriptional and translational levels. The other course is taught in a problem-solving mode and is designed for more advanced students. It covers molecular genetics, including gene structure and function, as well as molecular and cellular biology. In addition, students from both courses attend lectures concerning the principles of human genetics and aspects of physiological chemistry, such as mechanisms of blood clotting. A clinical correlate is held each week and all students give a seminar presentation.

Behavioral Sciences I

The curriculum is designed to help the student learn the behavioral aspects of medicine as they apply to general medical and surgical practice. Behavioral Sciences I covers normal human development, the basics of the doctor-patient relationship, basic interviewing techniques, and behavioral neurochemistry. It includes readings, lectures, and small group discussions.

Nutrition

Nutrition is studied as it relates to clinical practice. The curriculum covers a broad overview of the nutritional aspects of disease prevention and health promotion as well as nutritional support in a variety of disease states.

First and Second Years:

Basic Science and Preclinical Course Work

First Year	Hours	Second Year	Hours
Gross Anatomy and Embryology	200	Pathology	172
Biochemistry	168	Clinical Pathology	56
Histology	70	Pharmacology	140
Neuroanatomy	90	Behavioral Science II	60
Physiology	200	Preventive Medicine	80
Microbiology	200	Examination of the Patient	78
Behavioral Science I	30	Mechanisms of Disease	130
Nutrition	20	Introduction to the Clerkships	122

Third and Fourth Years: Clinical Clerkships and Electives*

Clerkship Rotations (Third Year)	Weeks	Electives and Core Clerkships (Fourth Year)	Weeks
Pediatrics	10	Radiology	3
Obstetrics and Gynecology	10	Neurosciences	4
Psychiatry	8	Ophthalmology	1
Physical Medicine and Rehabilitation	2	Anesthesiology	1
Junior Medicine	10	Senior Medicine	5
Surgery	10	Surgical Subspecialties	2
Primary Care	5**	Surgically Related Electives	3
		Medically Related Electives	5
		Nondesignated Electives	16

*The sequence of the third and fourth years varies; student rotation is assigned by lottery.

**One-half day per week for 50 weeks.

Physiology

The course consists of lecture, special topic and review sessions, and audiovisual presentations of the classical concepts of vertebrate physiology, with emphasis on the function of normal tissues in man. Specific topics related to neurological, cardiovascular, respiratory, renal, gastrointestinal, endocrine, exercise, and temperature regulation are presented.

Microbiology

This course deals with the biochemical and genetic properties of infectious agents, activities of toxins, chemotherapy, and the biochemistry and genetics of antibiotic resistance. A considerable portion of the course deals with the humoral and cellular basis of immunity and the genetic control of the immune response. The course also includes an in-depth study of the biology of parasites and the structure and activity of viruses.

Second Year: Preclinical Sciences

No more than seven hours of instruction will be scheduled each day, and of these no more than four are formal lectures. Exceptions to this policy are made during the third quarter of the second year.

Pharmacology

This course deals with drugs of various classifications which are used for specific or symptomatic therapies of disease states. Emphasis is on the mechanisms of action of drugs at the organ or system level and on their use in medical therapy. The course includes lectures that illustrate pharmacologic principles, supplemented by small group problem-solving sessions.

Pathology

Theoretical and practical aspects of pathological processes are presented to provide an orientation to disease mechanisms. Disease is presented as a dynamic process that affects the organism at molecular, cellular, tissue, and organ levels.

Clinical Pathology

This course consists of lectures and laboratories covering the areas of hematology, blood bank, clinical chemistry, and microbiology.

Examination of the Patient

Basic instruction and experience are offered in the elements of physical diagnosis, patient interviews, history, and physical examination.

Behavioral Sciences II

Behavioral Sciences II covers psychopathology and substance abuse. The course consists of readings, lectures, and small group discussion. Students also are exposed to patients and learn the dynamics of the patient interview. In Behavioral Sciences I, the emphasis is on interviewing "normal" people; in Behavioral Sciences II the student learns how to assess pathology.

Preventive Medicine

This course consists of five main sections: biostatistics, epidemiology, preventive medicine, health administration, and environmental and occupational medicine. The main segment, epidemiology, is presented in formal lectures and laboratory sessions. Methods are given for evaluating the distribution and possible causation of acute and chronic diseases, including infectious and noninfectious diseases, in human populations.

Mechanisms of Disease

An organ system approach is utilized in presenting the basic mechanisms or pathophysiology of disease.

Introduction to the Clerkships

This course combines information from several departments to familiarize the student with the clinical experience. It is a major link in the student's transition from basic science courses to the clinical clerkships.

Following this course students will be prepared to commence practical work and begin their clinical clerkships.

Third and Fourth Years: Clinical Sciences

The clinical experience is composed of (a) core clerkship rotations, with a specific allotment of time in each department and (b) electives. Sequencing of clerkships is determined by a student lottery conducted by the Office of Student and Curricular Affairs.

Clerkships

Anesthesiology

During the anesthesiology clerkship, students receive instruction in the basic principles of general and regional anesthesia, including the pharmacology of anesthetic drugs, airway management, preoperative evaluation of patients, surgical anesthesia, fluid balance, hazards of anesthesia, resuscitation, and the management of respiratory emergencies. A four-week elective is offered in which students gain familiarity with the technical aspects of anesthesia by spending each day in the operating room, participating in supervised "hands-on" patient care. Students attend departmental clinical conferences which are devoted to presentation and discussions of interesting cases and complications. A four-week rotation through the Veteran's Administration Medical Center, Long Beach Surgical Intensive Care Unit and an eight-week research elective also are offered.

Junior Medicine

Students are taught the appropriate diagnostic and therapeutic approach to commonly encountered medical illnesses. The intent is that, in addition to scientific aspects of medical diagnosis and therapy, students will develop an appreciation for the importance of psychosocial-economic factors in the care of the patient. Experience is provided with common medical procedures such as lumbar puncture, insertion of catheters, and thoracentesis. The student is expected to assume increasing responsibility for hospitalized patients and to develop an approach to patients' problems which includes references to the appropriate medical literature.

Senior Medicine

Students spend five weeks as subinterns during which time they carry the full ward responsibility of an intern on one-half the number of patients usually carried by an intern. A second five weeks is spent on medically related electives.

Neurosciences

The clinical neurosciences clerkship emphasizes the development of student skills in neurological examination as well as the medical and surgical management of patients with brain, nerve, and muscle disease.

Obstetrics and Gynecology

During this clerkship, students are taught the scientific basis of gynecology and obstetrics, including reproductive physiology, anatomy, fetal physiology, and pathology. Practical experience is offered in the management of normal and abnormal pregnancy and delivery. Instruction is given in office and surgical gynecology. Students who have completed an introductory clerkship may then apply for an advanced elective that

allows a progression of clinical responsibility both in operative obstetrics and office gynecology. This advanced period also may be devoted to an in-depth study of a subspecialty area such as gynecologic oncology, maternal-fetal medicine, reproductive endocrinology and infertility.

Ophthalmology

The core clerkship provides instruction in the basis of ophthalmoscopy, slit lamp examination, visual function testing, and management of emergency eye problems. Electives from one to four weeks may be taken in clinical suites, with exposure to ophthalmic surgery and emergency eye care.

Pediatrics

The pediatrics clerkship serves as an introduction to general pediatrics. Students rotate through the pediatric ward, the pediatric outpatient clinic, and the newborn nursery. During the clerkship, students are expected to refine their knowledge and skills in obtaining accurate historical data, performing physical examinations with pediatric patients, and developing appropriate diagnoses and management plans. Subspecialty clinics and community pediatric experiences also are included in the clerkship. The session also offers insight into the natural history of diseases associated with pediatric patients and stresses the relationship of the health of infants, children, and adolescents with regard to the integrity of the family unit.

Physical Medicine and Rehabilitation

During the physical medicine and rehabilitation rotation, students are assigned patients who are in an active rehabilitation program. Emphasis is placed on the rehabilitation of the total patient. The medical aspects of the patient's care are discussed in detail. Instruction is provided in the various physical techniques of rehabilitation and in the psychosocial factors which permanently affect this process.

Primary Care

Students attend an assigned primary care clinic one-half day per week for five consecutive quintiles during the junior year in either family medicine, internal medicine, or pediatrics. Each student becomes the primary care provider for a number of patients in an ambulatory setting and continues as their primary care provider throughout the clerkship. Under the supervision of primary care faculty, students gain specific primary care skills. This experience in continuous care should provide a basis for a student's selection of a career in a primary care specialty.

Psychiatry

The eight-week clinical clerkship is the culmination of the process of learning human behavior as it relates to general medicine. The student elects two four-week clinical rotations participating fully in patient care, clinical teaching, and conferences. Choices include adult inpatient psychiatry, substance abuse, child psychiatry, consultation psychiatry, and emergency room psychiatry. A wide variety of clinical settings and patient populations is available. A required lecture series is presented on Tuesday afternoons at UCIMC.

Radiology

Radiological sciences involves the diagnostic use of imaging and the therapeutic effect of radiation upon abnormal lesions in the body. Radiological sciences is taught throughout the four years of medical school: during the anatomy course in the first year, in the "Mechanisms of Disease" course the second year, as a required clerkship in the third year, and as

an elective in the fourth year. The Department has specialists in all subspecialty areas of radiology (nuclear medicine, ultrasound, computerized tomography, magnetic resonance imaging, spectroscopy) and the general diagnostic areas of radiology (chest, bone, gastrointestinal, and genitourinary). There are daily clinical film conferences with staff and residents. The American College of Radiology film learning laboratory is available for student use. There are daily seminars interrelating general medicine, surgery, and radiology. Emphasis is given to the use of all forms of imaging for diagnosis and treatment including an understanding of the risk/benefit ratios involved and the clinical indications for various radiologic procedures.

Surgery

The surgical clerkship provides students an opportunity to study surgical patients in outpatient and hospital settings as members of the surgical team. Students acquire surgical knowledge, as well as develop skills in taking medical histories and conducting physical examinations. Emphasis is placed on the clinical evaluation, pathogenesis, diagnosis, and treatment of surgical diseases.

Surgical Specialties

The objective of the surgical specialties clerkship is to provide an opportunity for students to expand their skills and knowledge in the surgical field. Students are required to complete six weeks of surgical specialties including urology, plastic surgery, orthopedic surgery, and otolaryngology.

Electives

A total of 24 weeks in the medical curriculum are allotted for elective time. Sixteen of those weeks are nondesignated electives, and students, depending upon their particular interests, needs, and goals, may take a variety of elective courses consisting of at least 30 contact-hours per week beginning in the fourth year. In addition, five weeks are devoted to medically related electives which may include pediatrics or family medicine, and three weeks are devoted to surgically related electives which may include anesthesiology or obstetrics and gynecology.

Electives must be approved by the clinical faculty advisor and the department chair. Students may take up to 12 weeks of electives at institutions other than UCI.

A listing of elective courses and descriptions can be found in the *Elective Book*, which is available from the Office of Curricular Affairs (on campus), and the Office of Student and Curricular Affairs at the UCI Medical Center.

All questions regarding the curriculum, electives, or matters of records should be directed to:

Curricular Affairs Office
Medical Sciences I, Room E120
College of Medicine
University of California
Irvine, CA 92717
(714) 856-5282

Office of Student and Curricular Affairs

The Office of Student and Curricular Affairs provides the day-to-day link between medical students and the academic and administrative functions of the College. Student and Curricular Affairs has personnel located on the UCI campus and at the UCI Medical Center, and the Office is divided into seven units: Office of the Associate Dean, Student and Curricular Affairs (Clinical), Student Development, Medical Education, Admissions, Curricular Affairs, and Financial Aid.

Student and Curricular Affairs has two broad goals: the first of these is to support the academic mission of the College of Medicine by facilitating the admissions, record keeping, and financial aid processes and by providing academic support services to help students gain the most from their medical education. The second goal is to assist students in their personal and professional development by identifying and responding to issues and problems they encounter while pursuing their medical education. This is accomplished through student support services, student development workshops, and seminars.

Among the many student support services offered by the Office of Student and Curricular Affairs are:

- Academic Counseling
- Academic Monitoring
- Assignment of Faculty Advisors
- Big Brother-Big Sister Programs
- Cross-Cultural Medical Alliance Series
- Liaison with the UCI Affirmative Action Office
- Liaison with General Campus Support Services
- National Board Review Course
- Peer Counseling
- Personal Counseling
- Student Development Workshops
- Study Skills Workshops
- Support to Medical Student Organizations
- Tutoring

The student development and medical education workshops are designed to enhance personal and academic growth, addressing topics and curricular issues in medical education as well as workshops in stress management, interpersonal relations, conflict resolution, test anxiety, note-taking, and a variety of other medical school related subjects.

In addition to providing general services to all students, the Office of Student and Curricular Affairs is responsive to the unique concerns of women, minority, disadvantaged, and nontraditional students. Such services include the following programs:

The Summer Pre-Entry Program introduces newly accepted minority and/or disadvantaged students to the type and volume of study materials they will encounter in medical school.

The program is intended to help students adjust to the professional school setting, meet new classmates, become acquainted with the surrounding communities, and get situated with living accommodations. The rigorous, highly scheduled, six-week summer program is designed to prepare entering students to succeed in the regular medical school curriculum, which begins in September. On-campus housing is provided to students who qualify according to Federal Health Careers Opportunity Program guidelines.

The Summer Premedical Program seeks to increase the number of minority and/or disadvantaged students who are accepted into medical school and who successfully complete their medical education. The program achieves this goal by providing participants with the special skills and prerequisites needed to become more competitive for entrance into a health professional school. The program is conducted on the UCI campus from early July to mid-August. Participants are housed in student resident halls, with room and board paid

by a grant from the Federal Health Careers Opportunity Program. Undergraduate students entering their second year in colleges and universities are encouraged to apply. Individuals who show a commitment to ultimately practicing in medically underserved areas are given highest priority.

Postgraduate Educational Programs

Residency Programs

The College of Medicine and its affiliated hospitals offer more than 600 residency positions in almost all areas of medicine. Training levels range from first-year residencies through sixth- and seventh-year levels and subspecialty fellowships. Inquiries about specific programs should be directed to the Program Director as listed in the *Directory of Residency Training Programs*, published each year by the American Medical Association, or to the chair of the appropriate College of Medicine department.

All residency programs meet the formal standards of the American Medical Association and the appropriate specialty boards. UCI adheres to the Health Professions Educational Assistance Act of 1976, P.L. 94-484, Section 709, regarding shared-schedule residency training positions.

Residents in all programs rotate to the UCI Medical Center at some time. Residents in anesthesiology, dermatology, diagnostic radiology, therapeutic radiology, medicine, neurology, ophthalmology, pathology, surgery, physical medicine and rehabilitation, and psychiatry also rotate to the Veterans Administration Medical Center, Long Beach (VAMCLB). Residents in medicine, family medicine, obstetrics and gynecology, neurology, ophthalmology, pathology, pediatrics, physical medicine and rehabilitation, diagnostic radiology, surgery, and therapeutic radiology also rotate to the Memorial Hospital Medical Center (MHMC), Long Beach. Residents may also spend periods of time at other affiliated hospitals and clinics.

Anesthesiology

The Anesthesiology Residency Program offers training for residents at the postgraduate PG-2 to PG-4 levels. The residents spend three years in intensive clinical anesthesia training at VAMCLB, San Bernardino County Medical Center, and UCI Medical Center, with a one-month rotation at Children's Hospital of Los Angeles and a month of cardiac anesthesia at Cedars-Sinai Medical Center (Los Angeles). Training is offered in general anesthesia, regional anesthesia, cardiac anesthesia, pediatric anesthesia, trauma anesthesia, neurosurgical anesthesia, anesthesia for all other surgical subspecialties, dental anesthesia, obstetric anesthesia, intensive care, respiratory therapy, and treatment of pain syndromes and outpatient anesthesia. Residents in their fourth postgraduate year may elect to take three to six months of subspecialty training in obstetrical anesthesia, critical care medicine, pediatric anesthesia, pain management, or research.

Community and Environmental Medicine (Occupational Medicine)

This residency program is offered by the Division of Occupational Medicine, Department of Community and Environmental Medicine. It is intended for physicians who are seeking certification by the Board of Preventive Medicine. A prerequisite to participation is a minimum of one year of postgraduate clinical training in a primary care discipline. The objective of the Program is the training of physicians in the fields of occupational medicine and industrial medical care. The resident is provided an academic foundation in occupational medicine, industrial hygiene, environmental toxicology,

and epidemiology, in addition to practical experience in preventive medicine as it is applied to employed persons. This two-year program includes didactic training and clinical and field experience in occupational health and safety. Upon completion of training, the resident is qualified to enter the specialty practice of occupational medicine in an industrial setting, in private practice, in a government agency, or in an academic institution.

Dermatology

The Dermatology Residency Program provides a strong foundation in clinical dermatology, as well as experience in investigative dermatology. All areas of dermatologic care and its subspecialties are included in the three-year Program. The Program integrates the activities of outpatient and inpatient facilities of the VAMCLB, the UCI Medical Center, faculty offices, and other clinical settings.

Family Medicine

The Family Practice Residency Program aspires to train competent family physicians who are prepared for practice in a setting of economic, ethnic, and cultural diversity. The program combines strong clinical rotations with ongoing training in family medicine that emphasizes behavioral medicine, cross-cultural medicine, preventive medicine, and practice management. Interest in health care for the medically underserved is encouraged.

Internal Medicine

The Department of Medicine's Residency Program is fully approved for three to five years of training by the American Medical Association's Council on Medical Education and Hospitals.

Currently there are 63 resident positions divided into a traditional three-year track (40 positions), a primary care track (18 positions), a one-year-only program (one position), and a combined medicine/pediatrics program (four positions).

Residents spend the majority of their time at the UCI Medical Center. They also rotate to Memorial Medical Center, Long Beach; the VA Medical Center, Long Beach; and Kaiser Hospital, Bellflower.

Teaching is done primarily by full-time faculty within the Department of Medicine. Subspecialty fellowships are offered in clinical immunology, cardiology, endocrinology, gastroenterology, hematology/oncology, infectious disease, nephrology, primary care, pulmonary disease, and rheumatology.

Medicine/Pediatrics (Combined Residency Program)

The Departments of Pediatrics and Medicine offer a four-year combined residency in medicine and pediatrics. This program was developed to blend two of the major specialties of medicine to allow residents to gain an in-depth understanding of both disciplines. This combined residency is expected to produce physicians who are capable of full-time practice in either discipline. Graduates are eligible for Board certification in both internal medicine and pediatrics.

Neurology

The Neurology Residency Program emphasizes the education and training of neurologists to meet the clinical needs of their patients by using both traditional methods and new techniques, some of which have been developed at the UCI Medical Center. Training takes the form of graded responsibility for inpatient care, regular outpatient clinical responsibilities, and rotations in associated neurological specialties. The Department strongly believes that an understanding of basic research methods is essential for the training of clinicians who will deal with the diversity of clinical problems in modern neurology. Thus, during the three-year training program, residents have the opportunity to participate in a variety of ongoing basic and clinical research projects within the Department.

Obstetrics and Gynecology

This four-year program provides a solid foundation of reproductive pathophysiology in the obstetric, gynecologic, endocrinologic, and oncologic aspects of women's health care. Based on this foundation, training continues with progressive resident responsibility for operative and medical management and surgical techniques. While predominantly clinical in scope, the program is strongly flavored by academic and research exposure. Training is provided in general obstetrics and gynecology with rotations in the subspecialties of perinatology, oncology, and endocrinology. There are seven resident positions available each year.

Ophthalmology

The three-year Ophthalmology Residency Program includes clinical experience with opportunities for basic research. The Department focuses on the total care of the patient. Experience is provided in a broad spectrum of disease and/or injuries and the full range of subspecialties as a result of the quality and diversity of teaching hospital facilities and faculties available to the resident.

Pathology

The Department of Pathology offers a residency training program covering all areas of anatomic and clinical pathology. The program is affiliated with Memorial Medical Center, Long Beach and the Veterans Administration Medical Center, Long Beach. The training for the combined anatomic and clinical pathology program consists of six months training in both anatomic and clinical pathology each year. The first two years consist of a core program providing exposure to each of the subspecialty areas of clinical pathology as well as surgical pathology, autopsy pathology, and cytopathology. The program is flexible to permit concentrated study in one of the subspecialties of clinical pathology or in straight anatomic pathology during the last two years.

Ample opportunities for research and teaching exist for individuals wishing an academic career. The opportunity for excellent preparation is also provided for individuals planning on a private practice in a community hospital.

Pediatrics

The Pediatric Residency Program emphasizes the interrelationship of patient care, didactic teaching, and research in the training of the pediatric resident physician. The focus of the Department is on the total care of the child from birth through young adulthood. A strong clinical and educational foundation is provided through experiences in a broad spectrum of disease and/or injury as well as training in biosocial pediatrics, preventive health care, and community resources.

The program offers variety and depth due to the diversity of the Department's two major teaching hospitals—the UCI Medical Center and the Miller Children's Hospital (located at Memorial Hospital Medical Center, Long Beach). The faculty at these institutions provide a comprehensive teaching program in general pediatrics and cover the full range of pediatric subspecialties. The care of children seen through the two hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. Thus, pediatric residents are exposed to a wide range of problems presented in settings ranging from intensive care to supervised office-based practice.

The Pediatric Primary Care Training Program is for residents who are particularly interested in practicing or teaching primary care pediatrics. The program blends an emphasis on ambulatory, continuous, primary pediatric care with training in traditionally underemphasized subspecialty areas such as learning and language disabilities, adolescent medicine, genetics and genetic counseling, and community medicine. It is designed to produce top caliber pediatricians who have the special skills essential to primary care practice.

Physical Medicine and Rehabilitation

The Department of Physical Medicine and Rehabilitation offers both a four-year combined internship-residency and a three-year residency for applicants who have had training in another field. The focus of both programs is on the diagnosis and comprehensive treatment and care of patients with neuromusculoskeletal or cardiopulmonary disabilities, from newborns to the elderly. Residents are also involved in research and medical student teaching.

Psychiatry

The Psychiatry Residency Program is a four-year program that fosters individuality, academic excellence, and broad patient experience. The core curriculum includes basic seminars, adult inpatient and outpatient psychiatry, child psychiatry, medicine, neurology, emergency psychiatry, consultation and liaison psychiatry, forensic psychiatry, psychopharmacology, and substance abuse. Residents spend time at the UCI Medical Center, private facilities, VAMCLB, and a State hospital, all of which provide a broad base and mix of experience in psychopathology. A wide variety of elective courses and experiences are available in this flexible, eclectic program. All residents are expected to complete a research project of high quality prior to completion of the program.

Radiological Sciences (Diagnostic Radiology)

The Department of Radiological Sciences has 28 residents training for certification in diagnostic radiology. The program is based at the UCI Medical Center and integrated with VAMCLB, and MHMC. Residents rotate through all three institutions.

The objectives of the program are (1) to provide individuals with a solid background in all modalities of imaging, (2) to provide an atmosphere conducive to research and to encourage opportunities for residents to participate in research work with physicians and scientists, and (3) to provide elective periods in which residents can work in given areas of the Department to increase their expertise or work on research projects during their residency training.

The residency program includes specialized training in interventional radiology, ultrasonography, nuclear medicine, computerized tomography, magnetic resonance imaging, and spectroscopy, as well as opportunities to participate in major research programs conducted in the Department. All residents are expected to complete at least one major paper during the program.

Candidates are accepted only at the postgraduate-2 level for a four-year program. Fellowships are available for an additional year in specialized areas following the successful completion of the residency. The newest technologies in the field of radiological sciences are available at UCI Medical Center and the College's affiliated institutions.

Radiological Sciences (Therapeutic Radiology)

The Residency Training Program in Therapeutic Radiology is designed to prepare suitably qualified applicants for careers in radiation oncology. Candidates enter a four-year program which includes one year of research experience. Unique opportunities exist for training in the use of interstitial and intracavitary treatment using radioactive isotopes and specially designed applicators. Elective rotation periods may be spent in related branches of medicine (e.g., medical oncology, surgical pathology, gynecologic oncology, etc.) or at other radiation therapy departments. The Program includes obligatory rotations at five participating hospitals: UCI Medical Center, VAMCLB, MHMC, City of Hope National Medical Center, and St. Joseph Hospital.

Radiological Sciences (Nuclear Medicine)

Candidates who wish to obtain certification for the Board of Nuclear Medicine or who wish to have further training in nuclear medicine must have completed the required period of prior residency training in either diagnostic radiology, internal medicine, or pathology.

The Nuclear Medicine Training Program involves one or two years and includes clinical and basic science components. It is a joint program with rotations at UCI Medical Center and VAMCLB. Didactic lecture series include physics, instrumentation, radiopharmacy computer principles, and radiation protection. All trainees are expected to be involved in some degree of research during the program.

Surgery

The philosophy underlying all aspects of surgical training is that surgery is best learned, taught, and practiced as applied clinical physiology. Operative techniques and applied anatomy receive appropriate attention. Major portions of clinical experience, teaching, conferences, research, and patient care are oriented toward understanding and correcting disordered human biology. The surgical specialty involves more years of training than other medical disciplines due to the breadth of diseases and complexity of pathophysiology involved in surgery. The Department offers residencies in general surgery, neurological surgery, orthopedic surgery, otolaryngology (head and neck) surgery, plastic surgery, thoracic surgery, and urology. It also offers fellowships in burn surgery, hand surgery, and surgical research.

Graduate Academic Programs

The College's basic medical science departments of Anatomy and Neurobiology, Biological Chemistry, Microbiology and Molecular Genetics, and Physiology and Biophysics participate jointly with the School of Biological Sciences in offering graduate instruction leading to the M.S. and Ph.D. degrees in Biological Sciences. The Department of Community and

Environmental Medicine, the Department of Radiological Sciences, and the Department of Pharmacology offer M.S. and Ph.D. programs. In addition, the Department of Pediatrics offers an M.S. degree in Genetics Counseling.

Application materials may be obtained by writing to the individual graduate programs or the:

Office of Research and Graduate Studies
145 Administration Building
University of California
Irvine, CA 92717
(714) 856-7295

Anatomy and Neurobiology

Faculty

Edward G. Jones, *Department Chair*: Sensory-motor anatomy and physiology
 Robert H. Blanks: Vestibular physiology and anatomy
 James H. Fallon: Circadian rhythms; monoamine systems, neurotransmitter interactions
 Christine M. Gall: Central nervous system morphological plasticity
 Roland A. Giolli: Experimental neuroanatomy; visual system
 Stewart H.C. Hendry: Visual cortex, structure and plasticity
 Paul J. Isackson: Molecular biology of nerve growth factor
 Herbert P. Killackey: Developmental neuroanatomy; somatosensory system
 Leonard M. Kitzes: Auditory neurophysiology; anatomy; development
 Diane K. O'Dowd: Function and regulation of ion channels
 Charles E. Ribak: Neurocytology; immunocytochemistry; neurotransmitters; neuronal circuitry
 Richard T. Robertson, *Vice Chair*: Experimental neurobiology; development; forebrain organization
 Malcolm N. Semple: Auditory neurophysiology
 Martin Smith: Molecular genetics of extracellular matrix molecules
 John E. Swett: Peripheral nervous system, spinal cord, pain mechanisms
 Yasuhiro Torigoe: Accessory optic system

The Department of Anatomy and Neurobiology in the College of Medicine offers a doctoral program leading to the Ph.D. degree in Biological Sciences, with specialized research training in the neurosciences. Research programs in the neurosciences include neurotransmitter immunocytochemistry, intracellular physiology, molecular neurobiology, the central neural regulation of circadian rhythms, forebrain organization, and function and development of sensory and motor systems. The Department maintains research facilities that enable the student to become experienced with the following techniques: electron microscopy; immunocytochemistry; molecular neurobiology; fluorescence histochemistry; neuroanatomical tracing; single- and multi-unit neurophysiology; and computer analysis of neuroscientific data. Students are encouraged to become proficient in multiple areas of study using numerous interdisciplinary techniques.

Students in the Department of Anatomy and Neurobiology have two major goals. The first goal is to attain the technical skills, theoretical background, and experimental knowledge necessary to conduct innovative and fundamental research. The second goal is to become knowledgeable anatomists with the ability to teach graduate, undergraduate, and professional courses in anatomy and neuroscience. These two goals are achieved through a flexible academic program that is tailored to the individual needs of the student.

The core curriculum is designed to provide all students with a fundamental knowledge of modern neurobiology, with an emphasis on morphology, chemistry, and physiology. In the first year, students are required to take selected courses in anatomy and physiology, including a year-long course in neural science techniques. In the second year, students take a year-long course in neural systems as well as biochemistry and pharmacology courses. Over the usual four-year training period the student will be required to complete a practical course in statistics, selected departmental seminar courses, at least two laboratory rotations, and a total of 50 credit hours of research in anatomy. Elective courses in the Department of Anatomy and Neurobiology or other departments on campus may also be taken; research and training in areas other than neurobiology are possible. The student typically devotes the majority of the first year to taking core courses and about half of the second year to taking electives. Following the first year, the student is expected to act as an assistant in one major anatomy core course.

When a student is accepted into the graduate program, the student and the Graduate Committee decide to which laboratories the student will be assigned the first year. During the first year the student will spend approximately 25 percent of the time doing research. By the end of the second year the student and the Graduate Committee select a faculty sponsor who will supervise the dissertation research. A qualifying examination at the end of the summer of the second year is given to the student by a candidacy committee. The examination consists of written papers in three of the following: fundamental neuroscience, developmental neuroscience, neural systems I, or neural systems II, determined by the candidate's field of specialization.

The dissertation research is chosen by the student and faculty advisor under guidance of the Graduate Committee. The majority of the second, third, and fourth year is devoted to completing the research and preparing a written dissertation suitable for publication.

An oral defense of the dissertation research before the student's advisor and Doctoral Committee constitutes the final examination. The Ph.D. degree in Biological Sciences is awarded following completion of all the requirements, a process that normally will take four years to complete.

Information on specific course descriptions in anatomy can be found in the School of Biological Sciences section.

Biological Chemistry

Faculty

Ralph A. Bradshaw, *Department Chair*: Structure and function of enzymes and growth factors and their genes
 Stuart M. Arfin: Genetic and biochemical regulatory mechanisms in mammalian systems
 Chris L. Greer: Eukaryotic RNA processing pathways; RNA splicing and gene expression
 Michelle M. Hanna: Photocrosslinking determination of transcription and translocation mechanisms
 Kenneth H. Ibsen: Properties, distribution, and control of expression of isoenzymes
 Lee McAlister-Henn: Molecular genetics of compartmentalized isozymes
 Calvin S. McLaughlin: Genetic and biochemical approaches to the synthesis of proteins and ribonucleic acids and their regulation in eucaryotic cells
 Masayasu Nomura: Structure, function, and biosynthesis of ribosomes; regulation of gene expression
 Robert E. Steele: Function of the *src* proto-oncogene
 John J. Wasmuth: Regulation of amino acid metabolism; mammalian cell genetics

Graduate instruction and research in molecular and cellular biochemistry leading to the Ph.D. in Biological Sciences is offered by the Department of Biological Chemistry in the College of Medicine. The curriculum is designed to prepare students for creative and productive careers in academic science and biotechnology. Faculty research interests focus on the regulation of gene expression (RNA splicing, mammalian chromosomal organization, and nucleic acid-protein interactions) and the regulation of cellular processes (membrane-hormone interactions, regulation of protein synthesis, molecular genetics of metabolic processes, and intracellular protein localization). Students are exposed to technical expertise in all facets of current research in molecular biochemistry from protein chemistry to genetic engineering.

In the first year, emphasis is placed on immediate research participation, supported by formal course work in protein and nucleic acid chemistry and function, enzymology, biological regulatory mechanisms, cell biology, and somatic cell and molecular genetics. Initial laboratory experiences are achieved by rotation through several laboratories with selection of an advisor occurring at the end of the first year. Student competence and critical thinking in the molecular aspects of biological sciences are tested by comprehensive examination following the first year of study. At the beginning of the third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. Completion of the Ph.D. degree normally requires five years.

Applicants for admission are expected to be well-prepared in the biological and chemical sciences. Graduate Record Examination General Test and Biology or Chemistry Subject Test scores are required.

Information on course descriptions may be found in the School of Biological Sciences section.

Environmental Toxicology

Faculty

Daniel B. Menzel, *Department Chair*: Toxicokinetics and mechanisms of carcinogenesis; biochemical toxicology
 Kenneth M. Baldwin: Exercise physiology and muscular stress
 Deepak K. Bhalla: Cell response to toxicants including transport of large molecules across pulmonary membranes
 Stephen C. Bondy: Neurotoxicology; biochemical changes in membranes resulting from toxic exposures
 Michael T. Kleinman: Uptake and distribution of inhaled toxic materials in the respiratory tract; effects of air pollutants on cardiopulmonary function
 William J. Mautz: Respiration, comparative and exercise physiology and the effects of air pollution on health
 Calvin S. McLaughlin: Biochemical toxicology and regulation of protein synthesis; mechanisms of action of mycotoxins including trichothecenes
 Betty H. Olson: Environmental microbiology and water chemistry; public policy issues in environmental toxicology
 Robert F. Phalen: Biophysics, aerosol science, and inhalation toxicology; toxicity of mixtures of particles and gases, lung defenses, and particle deposition in airways
 Ronald E. Rasmussen: Cell biology and physiology; DNA repair, chemical carcinogenesis
 Eloy Rodriguez: Phytochemistry and dermatotoxicology; biological chemistry of natural constituents of desert and tropical plants
 Ronald C. Shank, *Graduate Program Director*: Biochemical mechanisms in toxic tissue injury with emphasis on chemical carcinogenesis; application of tools of molecular biology to study cytotoxicity

The Department of Community and Environmental Medicine provides training in environmental toxicology, culminating with the award of the degree of Master of Science or Doctor of Philosophy in Environmental Toxicology. The Program in Environmental Toxicology provides students with the knowledge and skills necessary and appropriate to teach and/or conduct basic and applied research programs in inhalation/pulmonary toxicology, environmental carcinogenesis, biochemical neurotoxicology, and toxicokinetics.

Toxicology involves scientific study of the entry, distribution, biotransformation, and mechanism of action of chemical agents harmful to the body. The Program interprets environmental toxicology as the study of the effects and mechanisms of action of hazardous chemicals in food, air, water, and soil, in the home, workplace, and community, and considers experimentally and theoretically such diverse research problems as: (1) new scientific approaches to toxicological evaluation of environmental chemicals such as air and water pollutants, food additives, industrial wastes, and agricultural adjuvants; (2) mechanisms of action in chemical carcinogenesis and mutagenesis; (3) the molecular pathology of tissue injury in acute toxicity; and (4) scientific principles involved in extrapolating from laboratory animal data to expected effects on human health in environmental exposures.

Students entering the program have varied backgrounds, including chemistry, biology, and physiology. The curriculum is based on a foundation of basic and health sciences with applications of scientific principles to environmental problems. Formal course work is enriched by a strong commitment to student-professor contact throughout the program. An important and integral part of the learning process is an early and intensive involvement of the student in ongoing original research projects in environmental toxicology, especially inhalation/pulmonary toxicology, chemical carcinogenesis, biochemical toxicology, and neurotoxicology.

The University of California, Riverside (UCR) also offers a graduate program in environmental toxicology which emphasizes natural resources and environmental sciences. The UCI program, in contrast, emphasizes health effects and medical sciences. Cooperative arrangements facilitate interaction between the two programs.

In addition to meeting the general admission requirements set by the Office of Research and Graduate Studies, applicants must be admitted by an Admissions Committee composed of faculty members from the Department of Community and Environmental Medicine. Candidates are selected on the basis of a balanced evaluation of the following criteria: (1) prior scholastic performance, including a consideration of grade point average, course load, nature of courses taken, and college attended; (2) recommendations by professors and others; (3) scores on the Graduate Record Examination; the Subject Test in either Biology or Chemistry is strongly recommended; and (4) an interview by the Admissions Committee, when feasible. The applicant must have received a bachelor's degree in a biological or physical science, in a premedical curriculum, or have an acceptable equivalent. Applicants with a bachelor's degree in engineering may qualify for admission into the program if they have had sufficient training in the biological and physical sciences.

Undergraduate preparation of applicants should include six quarter units in general biology, zoology, bacteriology, or anatomy; 12 quarter units in mathematics, including calculus through vector analysis and differential equations; 32 quarter units of chemistry, including four quarter units of physical chemistry in which calculus is used; 12 quarter units of physics, including optics; and four quarter units in molecular biology or biochemistry.

Outstanding applicants who lack one or two of these prerequisites may be given an opportunity to take the required course(s) either before admission or during the first year in the graduate program; in such circumstances, none of these undergraduate courses may be used to satisfy the Program elective or core course requirements. Upper-division or graduate science courses may be considered as substitutes for the above prerequisites by the Admissions Committee.

The graduate core curriculum for the Ph.D. degree includes Environmental Toxicology 201, 202, 298, and 299, Physiology and Biophysics 206A-B, Molecular Biology and Biochemistry 203 and 204, Pharmacology and Toxicology 252, and Anatomy and Neurobiology 203. The core requirements for the Master's degree include Environmental Toxicology 201, 202, 298, and 299, and Pharmacology and Toxicology 252. In addition, for either program competence in statistical experimental design and computer science must be demonstrated in the student's research project.

Opportunities for individual training and independent research experience exist in inhalation and pulmonary toxicology, atmospheric chemistry and aerosol science, chemical carcinogenesis, neurochemistry, biochemical toxicology, toxicology of naturally occurring compounds, ultrastructure and the toxicologic response, exercise physiology and stress, and environmental microbiology and chemistry.

Graduate study in environmental toxicology is supported by a training grant from the National Institute of Environmental Health Sciences which offers stipends, tuition, and fees to qualified predoctoral graduate students and postdoctoral fellows. Research grants and contracts are available to support additional students as research assistants.

Graduate Courses in Environmental Toxicology

201 Principles of Toxicology (3) W. Structure-activity relationship and the receptor; dose-response relationships; absorption, distribution, and metabolism; quantitative methods in measuring acute and chronic toxicity; principles of toxic injury to tissues, especially liver; chemical carcinogenesis, mutagenesis, and teratogenesis; molecular mechanisms of toxic action. Same as Pharmacology and Toxicology 260.

202 Environmental Toxicology (3) S. Survey of toxicants in the environment (food, air, and water supplies); description of exposure and effects, especially in human populations; mechanisms of toxic action where known. Same as Pharmacology and Toxicology 265.

203 Toxicology Workshop (2) F, W, S. Four to six times during the quarter, a scientist of international stature spends the day with graduate students and postdoctoral trainees to discuss mutual research interests and technological problems in the laboratory.

204 Introduction to Neurotoxicology (3) F. The effects of various harmful chemicals upon nervous system function. Emphasis given to the molecular events underlying neurological damage and to the relation of such processes to basic mechanisms of neurobiology.

205 Toxins and Cellular Injury (4) S. In-depth examination of potent toxins of animal, microbial, and plant origin that are responsible for cell damage in animals and plants. Mechanisms of cellular toxicity with focus on the nucleus (nucleic acids), microtubules, mitochondria, and chloroplasts. Teratogens. Same as Developmental and Cell Biology 236.

212 Inhalation Toxicology (3) F. The principles and practice of laboratory inhalation toxicology. Topics include aerosols, gases, respiratory tract structure and function, lung defenses, aerosol deposition exposure techniques, characterization of exposure atmospheres, experimental designs, animal models, and regulations and guidelines.

213 Respiratory Physiology and Toxicology (3) W. Critical review of pulmonary physiology and toxicology with emphasis on mechanisms of toxicology, pulmonary toxicokinetics of gases and particles, lung mechanics, structure-functional aspects of lung injury and exercise physiology. Students participate in seminars and discussion groups. Prerequisites: previous course work in general histology and physiology.

230 Chemical Mutagenesis and Carcinogenesis (3) S. History of cancer and mechanisms in carcinogenesis; structure-activity relationships in chemical carcinogenesis; kinetics of metabolic activation of carcinogens; DNA repair and immunosuppression; mutagenicity as a predictor of carcinogenicity; *in vivo* and *in vitro* methods in mutagenicity and carcinogenicity testing.

270 Occupational Toxicology (4) F. Methods to assess the distribution of disease and causal relationships between various environmental factors including those at the workplace, and the health of at-risk populations. Same as Social Ecology 215.

297 Advanced Topics in Occupational Toxicology (2) F, W, S. Discussions with clinical and research faculty in environmental toxicology and occupational medicine on current toxicology problems in the workplace and critical review of current publications in the field. Journal club/seminar format.

298 Environmental Toxicology Seminar (2) F, W, S. Presentation and discussion of current research problems and issues by students, postdoctoral fellows, faculty, and guests, covering the broad research and policy areas of environmental toxicology.

299 Research Problems (1-12) F, W, S. Research work for the M.S. thesis or Ph.D. dissertation.

Genetics Counseling

Faculty

Maureen Bocian, *Division Chief*: Heterogeneity and variability in genetic syndromes; new syndrome identification; skeletal dysplasias; neurofibromatosis

Renée Bernstein: Chromosomal changes in cancer: X and Y chromosome abnormalities and sexual differentiation

Kenneth W. Dumars: Epidemiology of congenital and chromosomal abnormalities; gene linkage in tuberous sclerosis; genetic disease in Southeast Asians

Moyra Smith: Development and chromosomal assignment of DNA probes for human genes; linkage and gene mapping in neurogenetic disorders; genetics and regulation of alcohol metabolizing enzymes

Ann P. Walker: Genetic counseling; delivery of genetic services; computer uses in clinical genetics; genetics education

The Division of Human Genetics in the College of Medicine's Department of Pediatrics offers graduate education leading to the Master of Science degree in Genetics Counseling.

Graduates of the program are prepared to function as members of genetics teams engaged in providing clinical services, teaching, and research. Other roles for program graduates may include employment in local, state, or federal genetics programs, in categorical disease foundations, or in public education.

Division faculty and staff are involved in teaching, research, and patient service. Clinical activities include evaluation, early ascertainment, prenatal diagnosis, prevention, and management of genetic disorders, birth defects, and developmentally disabling conditions. Among faculty research interests are gene mapping and linkage analysis using DNA probes; delineation of new malformation and chromosomal syndromes; late-onset single-gene disorders; the incidence and perception of genetic disease, birth defects, and developmental disabilities in underserved ethnic populations; factors in the etiology of chromosomal abnormalities and congenital malformations; the cytogenetics of cancer and sexual differentiation; psychosocial issues in genetic disease and prenatal diagnosis; and delivery of genetic services.

During the six to eight academic quarters of the program, students must complete a sequence of core courses in medical

genetics, biochemical and molecular genetics, cytogenetics, child development, counseling issues and techniques, research methodology, ethical issues, and community resources. Experiential professional training occurs concurrently with formal course work in a variety of clinics at the UCI Medical Center, in the prenatal diagnosis program, in the cytogenetics laboratory, and in certain community agencies. Participation in these and other divisional and departmental professional and educational activities such as lectures, seminars, Pediatric Grand Rounds, cytogenetic rounds, and research, counseling, and patient management conferences is expected throughout the program.

Completion of the program requires a minimum of 58 quarter units of credit, a research thesis which should be publishable, and demonstration of satisfactory professional skills in genetic counseling. The program director serves as faculty advisor to students, although teaching and supervision of professional experiential training is shared among all division faculty and staff, who frequently review student progress. In the second year, development of professional skills can be individualized according to the student's needs and interests. It is anticipated that graduates will be eligible for American Board of Medical Genetics certification in genetic counseling within a year of completing the program.

Recommended undergraduate preparation includes course work in the biological sciences, especially in genetics, biochemistry, physiology, psychology, and human development. Course work in statistics is desirable. Facility in Spanish or a Southeast Asian language is a considerable asset. Extracurricular and/or employment experiences which provide evidence of the student's maturity, interpersonal skills, and promise as a genetic counselor figure prominently in the admissions decision. References should speak to these qualities as well as to the academic qualifications of the applicant. Graduate Record Examination (GRE) General Test scores must be submitted and Subject Test scores will be considered if they are available.

Applications are accepted for the fall quarter only and must be completed by February 1. Because of keen competition for places in the program, a two-stage admissions process is employed, with approximately one-fifth of the applicants being invited for interviews at UCI following an initial review of applications by the faculty. Interviews usually are conducted from March through early April, and the final selection is made from among the interviewed candidates during mid- to late April.

Graduate Courses in Genetics Counseling

200A Introduction to Medical Genetics and Cytogenetics (4) F. Lecture, three hours. Covers current concepts regarding mitosis, meiosis, the cell cycle, and chromosome ultrastructure and function. Clinical disorders caused by chromosomal aneuploidy, duplication, and deletion, and principles of Mendelian, chromosomal, and multifactorial inheritance are presented and illustrated.

200B Quantitative Genetics, Genetic Screening, Teratology (4) W. Lecture, three hours; cytogenetics conference, one hour. Quantitative aspects of human genetics, including population studies, linkage analysis, and genetic risk determination. Principles and techniques of prenatal, neonatal, and heterozygote screening. Pregnancy, delivery, and pre- and postnatal growth and development, with attention to reproductive and fetal effects of drugs, radiation, and other environmental factors. Prerequisite: 200A.

200C Human Genetic Disorders (4) S. Lecture, three hours; cytogenetics conference, one hour. Reviews a wide variety of genetic diseases, syndromes, and malformations from the standpoints of inheritance, diagnosis, natural history, and management. Prerequisites: 200A and 200B.

200D Disorders Due to Inborn Errors of Metabolism (4) W (alternate years). Lecture, three hours. Aspects of biochemistry and metabolism are reviewed with special emphasis on genetic abnormalities which lead to inborn errors of metabolism. Diagnostic procedures, heterozygote detection, treatment, counseling issues, and prenatal diagnosis are reviewed. Prerequisite: 200A or consent of instructor.

200E Molecular Genetics (4) S (alternate years). Lecture, two hours. The derivation of different types of DNA probes and DNA libraries, restriction endonuclease polymorphisms, assignment of genes to chromosomes, and genetic linkage. Particular emphasis is placed on the use of recombinant DNA technologies and genetic linkage analysis for diagnosis of human genetic disease. Prerequisite: 200A, 200D, or consent of instructor.

200L Cytogenetics Laboratory (4) W, S, Summer. Laboratory, 10 hours/week. A practicum introducing methods of specimen collection, short-term lymphocyte and bone marrow culture, long-term fibroblast and amniocyte culture, harvesting and slide preparation, chromosome staining, microphotography, and darkroom techniques. Microscopic chromosome analysis, photographic karyotyping, and the appropriate use of cytogenetic nomenclature are emphasized. Open only to Genetics Counseling students.

201A Introduction to Genetic Counseling (4) F. Seminar and fieldwork. By observing genetics evaluations, consultations, and patient management conferences, and through directed readings and discussions, students are introduced to the process of diagnosis, management, and counseling for genetic disease. Psychosocial issues in genetics are emphasized; instruction includes interviewing techniques, pedigree construction, and various other clinical skills. Open only to Genetics Counseling students.

201B Clinical Rotation I (4) W, S, Summer. Fieldwork. Provides extensive supervised experience in history taking, interviewing, and psychosocial assessment in the clinical genetics setting. Students independently perform telephone, office, and home-visit intake interviews, participate in counseling, and present cases at patient management conferences. Open only to Genetics Counseling students.

201C Clinical Rotation II (4) S, Summer. Fieldwork. Provides further supervised experience in genetic counseling, case management, clinic administration and organization, and the use of community resources. Emphasis is on sharpening counseling skills and on developing a professional identity and code of ethics. Open only to Genetics Counseling students.

201D Prenatal Diagnosis Counseling (4) Summer. Fieldwork. A practicum with extensive supervised experience in prenatal diagnosis counseling which provides the student with the opportunity to conduct genetic counseling sessions semi-independently and to further develop clinical skills. Open only to Genetics Counseling students. Prerequisites: 200A, 200B, and 200C.

202 Community Resources; Ethical Issues (4) S. Seminar. Community resources, including public and private agencies, parent-support and advocacy groups, schools and training centers, are discussed. Also explores ethical and legal issues in genetic screening and prenatal diagnosis, informed consent, privacy and confidentiality, treatment of severely handicapping conditions, access to services, and sterilization. Prerequisite: consent of instructor.

204 Professional Skills Development (4) F, W, S. Fieldwork. Students elect further clinical or laboratory experience, or concentrate on other areas deemed appropriate by the faculty. Students provide community and professional education regarding genetics topics and continue participating in clinical and research conferences. Open only to Genetics Counseling students.

295 Master's Thesis Research and Writing (2-8) F, W, S. Tutorial. Under the supervision of one or more faculty members, the student designs and conducts a research project or completes a case report. A problem in the cytogenetics, biochemical, clinical, psychosocial, or behavioral areas of medical genetics may be investigated. Prerequisite: consent of instructor.

Microbiology and Molecular Genetics

Faculty

Dennis D. Cunningham, *Department Chair*: Regulation of cell division; control of extracellular proteinases by protease nexins
 Alan Goldin: Molecular biology of the sodium channel; neurotropic virus-cell interactions
 George A. Gutman: Immunogenetics; antibody structure and gene organization
 G. Wesley Hatfield: Molecular mechanisms of biological control systems in *Escherichia coli*
 S. Moyed: Molecular genetics of antibiotic persistence in bacteria
 Suzanne B. Sandmeyer: Eukaryotic gene organization; transposable elements and tRNA genes in yeast
 Rozanne Sandri-Goldin: Molecular biology of herpesvirus; regulation of eukaryotic gene expression
 Bert L. Semler: Molecular biology of RNA viruses; expression of cloned DNA copies of poliovirus RNA in eukaryotic vectors
 Stephen J. Sharp: Molecular genetics of RNA polymerase III gene transcription
 Eric J. Stanbridge: Molecular genetics of cancer; mycoplasmas; medical microbiology
 Paul S. Sypherd: Molecular genetics of cellular morphogenesis in microorganisms

Graduate instruction and research in microbiology and molecular genetics leading to the Ph.D. in Biological Sciences are offered by the Department of Microbiology and Molecular Genetics. The curriculum of the Department is designed to provide advanced training to individuals interested in the molecular basis of genetic regulation in viruses, microorganisms, and cultured mammalian cells; and in the structure, genetics, and synthesis of immunoglobulins. The core curriculum focuses on the molecular biology and genetics of viruses and bacteria, the fundamentals of the immune response, the molecular biology of cultured animal cells, and the genetics and physiology of infectious agents.

It is strongly recommended that the student's undergraduate preparation include courses in calculus, physical chemistry, biochemistry, genetics, and general biology, and that the applicant take the Biology Advanced Test of the Graduate Record Examination. Before a graduate degree will be awarded, the student must demonstrate competence, by course work and examination, in biochemistry, physical chemistry, genetics, molecular biology, and various aspects of microbiology and immunology. During the first year, all students in the graduate program spend nine weeks in each of four faculty members' laboratories with the aim of becoming familiar with the research approaches and the laboratory techniques employed in each specific research area. Incoming students review their programs each quarter with the departmental graduate student advisor. During fall of the third year, each student takes an advancement to candidacy examination. Graduate students are required to take Molecular Biology and Biochemistry 203 through 208 and Microbiology and Molecular Genetics courses. The major remaining requirement for the Ph.D. degree will be the satisfactory completion and oral defense of a dissertation consisting of original research carried out under the guidance of a faculty member. Students with adequate preparation should be able to complete the Ph.D. within five years.

Information on course descriptions may be found in the School of Biological Sciences section.

Pharmacology and Toxicology

Faculty

- Larry Stein, *Department Chair*: Neurochemistry of reward, punishment, and long-term memory
- James D. Belluzzi: Behavioral neurochemistry and neurophysiology of brain substrates of reward and memory; computer methods in neuroscience
- Floyd E. Bloom: Neurotransmitter pharmacology and brain localization, behavioral neurobiology. *Director*, Division of Preclinical Neuroscience and Endocrinology, Scripps Clinic and Research Foundation, University of California, San Diego
- William E. Bunney, Jr.: Clinical psychobiological and neuropsychopharmacological studies of manic-depressive illness, schizophrenia and childhood mental illness
- Sue P. Duckles: Pharmacology and physiology of vascular smooth muscle; regulation of cerebral circulation, pharmacology of the autonomic nervous system
- Frederick Ehler: Receptor mechanisms; pharmacology of calcium channels
- Alan S. Fairhurst: Calcium movements across membranes and effects of drugs upon these processes
- Charles Gorenstein: Histochemical localization and biochemical characterization of enzymes involved in the metabolism of peptide neurotransmitters
- John C. Kramer: Ethno-Pharmacology; the historical and cultural aspects of drug use
- Diana N. Krause: Cerebrovascular and neurotransmitter pharmacology; regulation of the blood-brain barrier
- Irving H. Leopold: Ophthalmological pharmacology
- Frances M. Leslie: Pharmacological characterization of multiple neurotransmitter receptors; physiological role of endogenous opioids
- Ralph E. Purdy: Pharmacological and biochemical characterization of cardiovascular adrenergic and serotonergic receptors
- Ronald E. Rasmussen: Environmental toxicology and chemical carcinogenesis
- Peter T. Ridley: Cardiovascular and gastrointestinal pharmacology, CNS and skeletal-muscle pharmacology, ophthalmological and dermatological pharmacology
- Ronald C. Shank: Biochemical mechanisms in toxic tissue injury with emphasis on chemical carcinogenesis; toxicology of environmental and food-borne substances; metabolism and disposition of toxicants

Graduate instruction and research in pharmacology leading to the M.S. and Ph.D. in Pharmacology and Toxicology is offered by the Department of Pharmacology. The Department is engaged in a broad scope of research activity. Faculty research interests include the mechanisms of action and effects of drugs on the nervous system and on behavior, on skeletal muscle, heart and blood vessels, and on basic processes in these tissues. Other areas of interest are the toxicology of environmental substances, especially inhalation toxicology, genetic toxicology, and chemical carcinogenesis.

Prerequisites for admission include a background in the physical and biological sciences which includes courses in mathematics, physics, chemistry, and biochemistry, including laboratory experience. The Graduate Record Examination and Subject Test in Biology or Chemistry are required. Primary emphasis in the Department's graduate program is placed on training leading to the Ph.D. in Pharmacology; under exceptional circumstances a student may be admitted initially into the M.S. program.

The graduate core program includes Pharmacology 241A-B, 252, 253, 254, 255, and 260, quarterly participation in Pharmacology 298, a course in computer science, and any additional elective courses assigned by faculty advisors. The major additional requirement for the Ph.D. is the satisfactory completion and oral defense of a dissertation based on original research carried out under the guidance of a faculty member. All candidates for the Ph.D. degree are required to engage in research activities throughout the course of their

academic programs. This requirement applies to all students whether or not they are compensated for such services. An appointment as a research assistant is awarded on the basis of scholarship and not as compensation for services rendered. Before advancing to candidacy each student must pass a written qualifying examination to determine the student's competence in pharmacology or pharmacology and toxicology. The full-time student is expected to pass the written qualifying examination by the eighth quarter and the oral qualifying examination for the Ph.D. by the eleventh quarter. All requirements for the Ph.D. degree should be completed within four to five years. For more information, contact the Graduate Advisor, Department of Pharmacology.

Graduate Courses in Pharmacology and Toxicology

210 The Structure of Nervous Tissue (Neuroanatomy for Pharmacologists) (2) F. Lecture, one and one-half hours. The structure of nervous tissue—neurons and synapses, supporting cells, peripheral nervous system, aspects of nervous organization, development of the nervous system, basic neuroanatomical methods. Open only to Pharmacology and Toxicology students.

241A-B Medical Pharmacology (6-6) F, W. Lecture, eight hours. Mechanism of action, toxicology, and usage of chemical agents in medical practice. Dose-response and time relationships, absorption, metabolism, excretion, and differences in systematic and species response. Poisons, principles of toxic action, and toxicity evaluation. Sources of toxicants in the environment. Prescription writing. Prerequisites: Physiology and Biophysics 206A-B and Molecular Biology and Biochemistry 210A-B.

248A-B-C Advanced Topics in Pharmacology (4-4-4). Lecture, conferences, seminars, four hours. A detailed study of important areas of pharmacology integrating biochemical, pathological, physiological, behavioral, and clinical aspects with emphasis on mechanism of action of drugs. Prerequisites: Pharmacology 241A-B.

252 Neurotransmitter and Drug Receptors (4) S. Lecture, two hours. Seminar, two hours. Evolution of the receptor concept, analysis of receptor properties by bioassay methodology, receptor binding studies, solubilization and purification of receptors, electrophysiological analysis of receptor channels, and cell biology of receptors.

253 Pharmacology of the Cardiovascular System (4) W. Lecture, one hour; seminar, two hours. Important aspects of cardiovascular pharmacology including adrenergic neurotransmission and the pharmacology of calcium; neuronal uptake, storage, and release of catecholamines; postsynaptic α -1 and α -2 adrenergic receptors; calcium entry and intracellular release; calcium channel agonists and antagonists; calmodulin; inositol phosphate mechanisms. Prerequisite: consent of instructor.

254 Methods in Pharmacology (4) Summer. Lecture, one hour; laboratory, six hours. Isolated tissues for receptor characterization, autoradiography, tissue culture, electrophysiological measurements, behavioral assays, radioligand binding methods, chromatography, centrifugation and other methods for subcellular tissue preparation, small animal handling, synaptosomes, and isolated tissues for the study of neurotransmission. Prerequisite: consent of instructor.

255 Central Nervous System Pharmacology: Disease Processes (4) F. Seminar, two hours. The molecular mechanisms and pharmacology of brain diseases. Includes review of Alzheimer's disease, diseases of the basal ganglia, pharmacology of drug abuse, and the pharmacology of memory. Prerequisite: consent of instructor.

260 Principles of Toxicology (3) W. Lecture, three hours.

Structure-activity relationship and the receptor; dose-response relationships; absorption, distribution, and metabolism; quantitative methods in measuring acute and chronic toxicity; principles of toxic injury to tissues, especially liver; chemical carcinogenesis, mutagenesis, and teratogenesis; molecular mechanisms of toxic action. Same as Environmental Toxicology 201.

265 Environmental Toxicology (3) S. Lecture, three hours. Survey of toxicants in the environment (food, air, and water supplies); description of exposure and effects, especially in human populations; mechanisms of toxic action where known. Same as Environmental Toxicology 202.

298 Seminar (2) F, W, S. Presentation and discussion of current problems and methods in teaching and research in pharmacology, toxicology, and therapeutics.

299 Research (1 to 8) F, W, S. Research work for M.S. thesis and/or Ph.D. dissertation.

Physiology and Biophysics

Faculty

Kenneth M. Baldwin, *Acting Department Chair*: Hormonal and exercise factors regulating biochemical properties of muscle

Michael E. Barish: Neuronal differentiation; physiology of neuroglia
Marianne Bronner-Fraser: Developmental neurobiology; migration and differentiation of the avian neural crest

Michael D. Cahalan: Ion channels in the nervous and immune system

Scott E. Fraser: Developmental neurobiology and pattern formation; development and plasticity of the lower-vertebrate visual system; gap junctions in tissue patterning

Alan L. Goldin: Molecular biology of neural channels and receptors

Harry T. Haigler: Cellular and molecular mechanisms by which EGF stimulates cell replication

James E. Hall: Molecular aspects of ionic conductance in membranes; channel reconstitution

Daniel Hollander: Gastrointestinal physiology; aging and nutrient absorption

Russell E. Jacobs: Peptide-membrane interactions; MRI in developmental biology

Janos K. Lanyi: Bioenergetics of membrane transport by bacterial retinal proteins

Kenneth J. Longmuir: Metabolism and intracellular transport of lipid in mammalian cells; metabolism of pulmonary surfactant

John D. Scott: Structure and function of protein kinases

Larry E. Vickery: Enzyme mechanisms and regulation of steroid hormone biosynthesis

Harry Walter: Characterization of cell membrane surfaces by partitioning in two-polymer aqueous systems

Stephen H. White: Membrane structure; physical chemistry of membranes and lipid bilayers

Graduate instruction and research in physiology and biophysics leading to the Ph.D. in Biological Sciences are offered by the Department of Physiology and Biophysics, College of Medicine. The Department provides research opportunities in the molecular biophysics of membranes and proteins, endocrinology, molecular and cell biology, developmental neurobiology, and exercise physiology. The curriculum provides the student with a broad background in physiology and biophysics and the closely related fields of cell biology and biochemistry. Elective courses permit in-depth exploration of particular areas. Interdisciplinary dissertation research involving the research of more than one faculty member is encouraged.

Prerequisites for admission normally include a bachelor's degree in one of the biological sciences, physics, chemistry, mathematics, or engineering, as well as undergraduate courses in calculus, organic and physical chemistry, biochemistry, and advanced biology (e.g., neurophysiology, cell biology, neurobiology, psychobiology). Up to two prerequisites may be fulfilled as first-year electives. GRE General Test

scores are required. Preference will be given to those students who have prior research experience.

The Department admits about three highly qualified students each fall. The program emphasizes original research, and students are expected to become involved in the research of the Department as early as possible. The core program includes graduate courses in physiology, biophysics, biochemistry, and cell biology. After the first year, training will continue through in-depth, advanced physiology courses, combining discussion with laboratory exercises. Students will participate in a research seminar designed to strengthen research techniques and presentation as well as attend the weekly colloquium in physiology. Each student must submit a written dissertation on an original research project and successfully defend this dissertation in an oral examination.

Incoming students will receive academic advising from the Department Graduate Advisor until such time as they choose a thesis advisor. The faculty conducts quarterly reviews of all continuing students to ensure that they are maintaining satisfactory progress within their particular academic program. Students who have completed all necessary prerequisites should be able to complete the Ph.D. within five years.

A comprehensive examination will be administered in June at the end of the second year. The examination is based upon material in the advanced physiology series and is designed to test the student's ability to organize a body of knowledge and to think critically. During the third year, the student will present a seminar on a topic approved by the formal candidacy committee. Following the seminar, the committee will critically examine the student's qualifications for the successful conduct of the doctoral dissertation. Advancement to candidacy for the Ph.D. is recommended to the Dean of Graduate Studies upon the unanimous vote of the committee.

Information on course descriptions may be found in the School of Biological Sciences section.

Some faculty from the Department are members of an interdisciplinary biophysics and biophysical chemistry group; see page 95 for a description of the program.

Radiological Sciences

Faculty

Richard M. Friedenberg, *Department Chair*: MRI of the urogenital system; digital uro-radiology and tomography

Anne-Line Anderson: Development of radiopharmaceuticals; quantitative structure-activity relationships

Philip Braunstein: Emission tomography; nuclear cardiology; image perception, and related phenomena

Richard Buxton: Physics and applications of nuclear magnetic resonance imaging; tracer kinetic models in nuclear medicine; medical image processing

Zang-Hee Cho: Multidimensional imaging; NMR tomography, and positron emission tomography

Martin Colman: Drug radiation interactions; optimization of time-dose factors in the treatment of cancer by irradiation; late effects of cancer treatment; radiation carcinogenesis

Leonard A. Ferrari: Signal and image processing; computer engineering; ultrasonic imaging; ultrasonic tissue characterization

- Joie P. Jones: Ultrasonic tissue characterization; ultrasonic imaging; general applications of ultrasound technology; the propagation and scattering of ultrasonic pulses in inhomogeneous media; biological effects of ultrasound
- Frederic C. Ludwig: Mammalian radiation biology; late effects of radiation on blood-forming tissues and their relationship to the induction of leukemia
- Eric N.C. Milne: X-ray imaging and the development of improved x-ray sources; magnification and 3-D radiography; pulmonary and microvascular pathophysiology
- Orhan Nalcioğlu: Imaging physics with specific applications to digital radiography, CT, and NMR tomography
- Bouchaib Rabbani: Influence of hyperthermia and sequencing on drug radiation cell killing; temperature dependence of drug-radiation interactions
- J. Leslie Redpath: Cellular and tissue radiobiology including mechanisms of chemical modification of radiation damage; oncogenic cell transformation; genetic aspects of cellular sensitivity
- Frederick Reines: Experimental particle physics; low-level counting; biological effects of ultrasound
- Werner Roeck: Engineering aspects of radiographic imaging systems; digital radiography
- Jack Sklansky: Computer-aided analysis of medical images; pattern recognition and information engineering

The Department of Radiological Sciences offers graduate programs of advanced study leading to the M.S. and Ph.D. degrees. Both programs are oriented toward the education and training of the superior student who has the potential and desire to become a creative and productive member of the medical or medical-related communities. The primary concentration of the program is in imaging.

A broad-based, interdisciplinary curriculum places heavy emphasis on research and is designed to provide the student with a comprehensive knowledge of the field in addition to an exceptionally high level of competence in one or more subspecialties. By utilizing the training received in medical imaging, medical physics, bioengineering, radiobiology, and radiological engineering, the student should be prepared for a wide range of career opportunities in university, hospital, or industrial settings upon completion of this program. Prospective students are cautioned that the program is extremely demanding and requires a broad base of knowledge in a variety of the conventional disciplines.

The Department of Radiological Sciences has well-equipped research laboratories in imaging physics, radiation biology, radiation physics, radio-pharmacy, and radiological engineering located on campus and at the hospitals associated with UCI.

The core program plus additional courses as may be required by the Graduate Committee normally will require two years to complete. To receive either the M.S. or Ph.D. degree, the student must successfully complete the core courses or their equivalents.

Requirements for the M.S. degree may be satisfied in one of two ways. Under Plan I, the student completes the Radiological Sciences core program with an average grade of B or above and under the direction of a faculty advisor also prepares a thesis that is acceptable to the thesis committee. Under Plan II, the student completes the core program plus a minimum of eight additional credits (all with an average grade of B or above) in a given area of specialization and satisfactorily passes a comprehensive written examination.

Requirements for the Ph.D. degree may be divided into four stages. First, the student must complete the core program and take additional course work as recommended by the Graduate Committee, all with an average grade of B or

above. Second, the student must pass a written and oral qualifying examination given at the end of the second full year of study. A student who fails the preliminary qualifying examination can, with approval from the Graduate Committee, repeat the examination the following year. Third, within a year after passing the preliminary examination, the student must pass the final oral qualifying examination covering the proposed field of research and be advanced to candidacy. Finally, a dissertation representing original research in the student's principal field of study must be prepared and defended. The dissertation, conducted under the direction of the doctoral committee, represents the major element in the doctoral program; it must be a significant contribution to the field and is expected to demonstrate critical judgment, intellectual synthesis, and creativity. During the final quarter of graduate study the student is required to defend the dissertation in an oral examination conducted by the doctoral committee.

Admission to the graduate program is by the Dean of Graduate Studies upon recommendation of the Department and is based upon letters of recommendation, Graduate Record Examination scores, previous scholarship, and other qualifications. Applicants should have a broad undergraduate background in both the physical and the biological sciences as well as in mathematics. Since most students will need some additional work in one or more disciplines, the graduate program allows for the correction of minor deficiencies during the first year, as determined by departmental review. Although the program is rigorous, it is also sufficiently flexible to allow for a wide range of interests and objectives.

Application deadline for the fall quarter is June 1 of each year. However, to receive full consideration for financial assistance, fall quarter applications should be completed by February 1. Applications for the winter and spring quarters will be accepted only under special circumstances.

Graduate Courses in Radiological Sciences

201A-B Fundamentals of Imaging Physics (4-4) F, W. Lecture, three hours. A unified approach to the mathematical and physical properties of medical imaging.

203 Engineering Principles of Radiographic Systems (2) F. Laboratory, six hours. Laboratory in the engineering aspects of radiographic systems and equipment. Prerequisite: consent of instructor.

240 Introduction to Radiation Biology (4) W. Lecture, three hours. An introduction to radiation biology at the molecular, cellular, and tissue level. Relevance of radiation biology to radiation therapy, diagnostic radiology, nuclear medicine, and ultrasound.

252 Principles of Radiation Protection (4) S. Lecture, three hours. Natural and artificial sources of radiation exposure; guides for radiation protection.

255 Laboratory in Radiation Detection and Protection (2) S. Laboratory, six hours. Laboratory in the detection, measurement, and protection of radiation.

260A-B-C Principles of Medical Imaging (4-4-4) F, W, S. Lecture, three hours. The application of various imaging techniques and principles of physics and engineering to medicine. Prerequisites: Radiological Sciences 201A-B and 203.

265A-B-C Laboratory in Medical Imaging (2-2-2) F, W, S. Laboratory, six hours. Laboratory involving the various imaging techniques used clinically or under development.

267 Electronics for Nuclear Magnetic Resonance Instrumentation (2) W. Laboratory, six hours. Laboratory involving the electronic details of NMR imaging.

270A-B Physical Acoustics (4-4) F, W. Lecture, three hours. The physical principles of acoustics and mechanical radiation, especially at ultrasonic frequencies. Topics include radiation fields; propagation in layered media; generation and detection of acoustical waves; ultrasonic propagation in gases, liquids and solids; nonlinear acoustics; environmental, architectural, underwater and medical acoustics; physical models of tissue. Prerequisite: consent of instructor.

272 Detection and Dosimetry of Ionizing Radiation (4) S. Lecture, three hours. Principles and methods of ionizing radiation detection; measurement of energy and intensity; instruments and techniques. Physical basis of radiation dose measurement; exposure and absorbed dose in tissue; dose, dose rate and microdose distributions and biological effectiveness.

288 Principles of Radiopharmaceuticals (3) F. Lecture, two hours. Production of medical radioisotopes, including generator systems. Chemistry, labeling techniques, quality control, and pharmacology of radiopharmaceuticals. Prerequisite: consent of instructor.

290 Seminar in Radiological Sciences (2) F, W, S. Seminar, two hours. Directed review and discussion of recent advances in areas of current interest. Presentations are given by students, faculty, and invited speakers.

292 Independent Study (variable) F, W, S. Individual study or research under the direction of a faculty member.

295A-B-C Clinical Workshop in Radiological Sciences (2-2-2) F, W, S. Laboratory, six hours. Clinical experience in the various areas of radiological sciences including general diagnosis, nuclear medicine, ultrasound, MRI, and interventional vascular work.

298 Master of Science Thesis Research (variable) F, W, S. Individual research under the supervision of a faculty member directed toward completing the thesis required for the M. S. degree in Radiological Sciences.

299 Doctor of Philosophy Dissertation Research (variable) F, W, S. Individual research under supervision of a faculty member directed toward completing the dissertation required for the Ph.D. degree in Radiological Sciences.

Department of Athletics and Physical Education

John E. Caine Chair

Stephen Ainslie, B.A. University of California, Irvine, *Men's Golf Coach*

Dean Andrea, B.A. University of Dayton, *Women's Basketball Coach*

Bill C. Ashen, *Men's Volleyball Coach*

Michael Bokosky, M.A. California State University, Los Angeles, *Assistant Men's Basketball Coach*

John E. Caine, Ed.D. University of Northern Colorado, *Chair of the Department of Athletics and Physical Education, Director of Athletics, and Supervisor of Physical Education*

Linda B. Dempsay, M.A. University of California, Berkeley, *Supervisor Emeritus*

Robin L. Dreizler, *Assistant Men's Baseball Coach*

Conni Earley, B.A. Fresno State University, *Men's and Women's Diving Coach*

Lisa Fraser, B.A. Sonoma State University, *Women's Soccer Coach*

Michael Gerakos, B.S. University of California, Los Angeles, *Men's Baseball Coach*

Peter H. Hofinga, M.S. Baylor University, *Supervisor of Physical Education*

Doreen Irish, M.A. California State University, Los Angeles, *Women's Tennis Coach*

Albert M. Irwin, B.A. University of the Pacific, *Supervisor Emeritus*

Jean Kinn, B.S. University of Nevada, Las Vegas, *Assistant Women's Basketball Coach*

Derek Lawther, *Men's Soccer Coach*

Myron McNamara, B.A. University of Southern California, *Lecturer Emeritus*

Larry M. Moore, M.S. University of California, Irvine, *Crew Coach*

William G. Mulligan, M.A. DePaul University, *Men's Basketball Coach*

Edward H. Newland, B.A. Occidental College, *Men's Water Polo Coach*

Vincent F. O'Boyle, M.A. Azusa Pacific University, *Director of Track and Field; Men's and Women's Cross Country Coach*

Gregory P. Patton, B.A. University of California, Santa Barbara, *Men's Tennis Coach*

Robert Pomeroy, M.A. Chapman College, *Associate Director of Athletics/Facilities, Academic Coordinator*

Michael Puritz, B.A. California State University, Long Beach, *Women's Volleyball Coach*

Charles Schober, B.S. Oklahoma University, *Men's and Women's Swim Coach*

Raymond H. Thornton, Ph.D. University of Southern California, *Supervisor of Physical Education*

Timothy M. Tift, M.A. Pepperdine University, *Lecturer in Physical Education*

Danny B. Williams, B.A. Occidental College, *Women's Track and Field Coach*

Craig Wilson, B.S. University of California, Irvine, *Sailing Coach*

The Department of Athletics and Physical Education's organization of three closely interrelated programs provides a broad spectrum of opportunities for students in physical education activity classes, intercollegiate athletics, and campus recreation. The Department's faculty and professional staff are dedicated to providing each student with the opportunity to participate in a broad program of physical activities, sports, and recreation. Students electing physical education activity classes, which include course offerings in 19 intercollegiate sports, may receive partial credit toward a degree up to a total of 4.2 units of credit. No degree in Physical Education is offered.

Campus Recreation

All officially enrolled students, as well as faculty and staff personnel, are encouraged to participate in the Campus Recreation Program offered by the Department of Athletics and Physical Education.

Intramural activities feature men's, women's, and co-rec team sports, and many individual and dual sports. Team sports include flag football, volleyball, basketball, softball, soccer, ultimate frisbee, and innertube water polo. A sampling of individual and dual sports includes badminton, board games, racquetball, table tennis, tennis, track and field, two-person volleyball, and wrestling. The emphasis is on participation, and activities are offered at all ability levels from novice to advanced.

The sport clubs aspect of the Campus Recreation Program provides students, faculty, and staff with an opportunity to participate in activities that fall beyond the scope of intramurals. Specialized instruction and extramural competition are the highlight of many club activities. Since clubs are student-initiated, offerings vary from year to year. Currently, active clubs include Aikido, bike racing, fencing, floor hockey, Hwa Rang Do, Karate, men's lacrosse, rugby, sailing, ski racing, surfing, table tennis, Tai Chi, Tang Soo Do, tennis, ultimate frisbee, water skiing, wind surfing, women's softball, women's water polo, and wrestling.

Informal recreation provides the UCI community with an opportunity to utilize the facilities in and around Crawford Hall, the departmental sports complex, in a nonstructured setting. Informal recreation hours are scheduled on a quarterly basis and vary according to facility availability.

Recreation instruction classes are offered quarterly to faculty, staff, and their spouses desiring specialized assistance in a variety of activities. Examples of these classes are: Aikido, horseback riding, ice skating, jazz dance, lifesaving, scuba diving, tennis, aerobics, kayaking, and sailing.

A special events program is offered each quarter to familiarize students with Campus Recreation activities and to facilitate campus community interaction. Titles of recent programs include "Recreation 'Round the World,'" "Almost Anything Goes," and "Late Night with Campus Recreation."

Members of the campus community who would like additional activities or clubs offered or who desire further information may contact the Campus Recreation Office, 1368 Crawford Hall, (714) 856-5346.

Sports Facilities

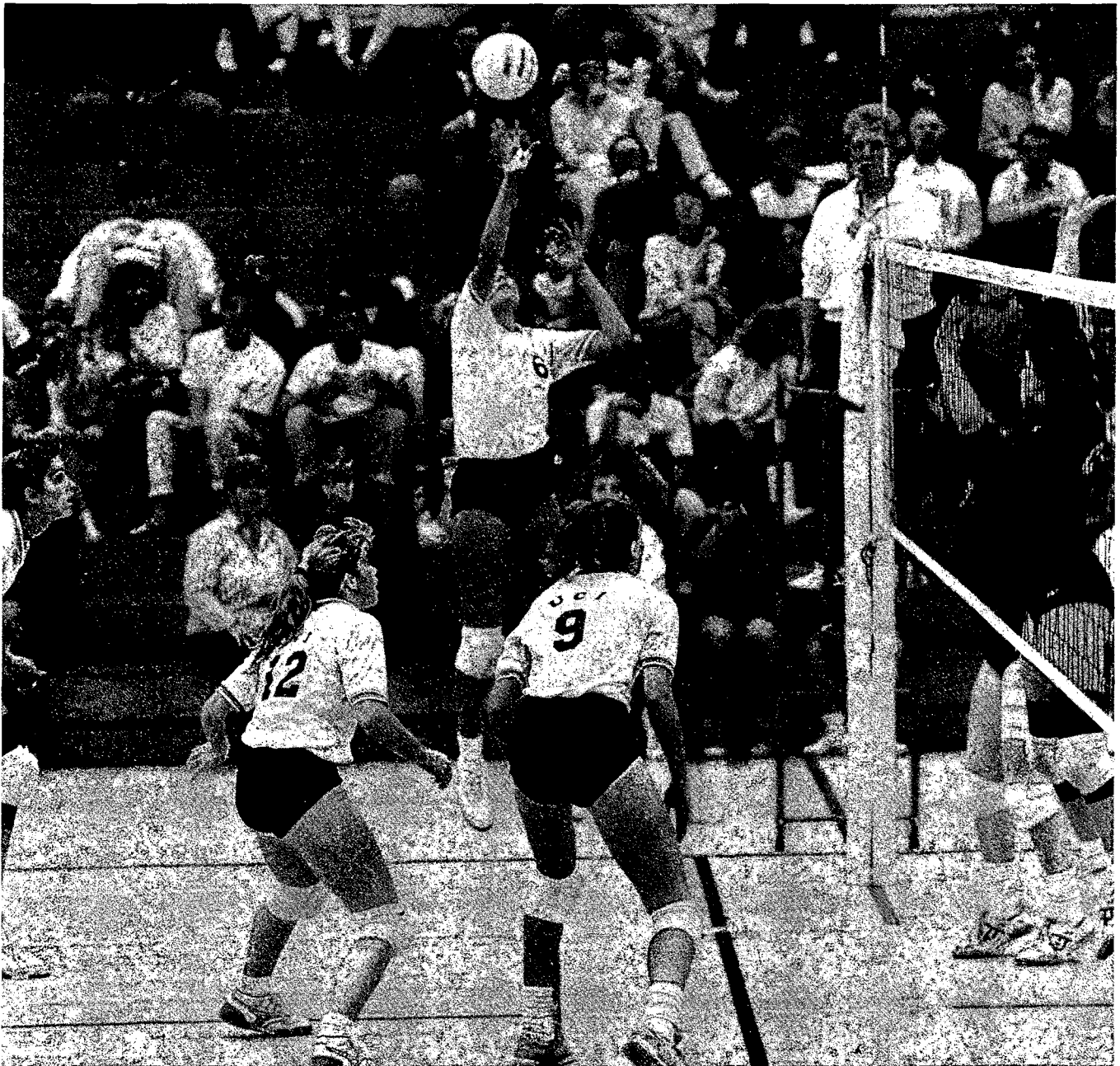
On-campus facilities include the Bren Events Center, which seats 5,000 for intercollegiate basketball and volleyball events. Crawford Hall features activity areas for badminton, basketball, combatives, fencing, volleyball, and weight training. Baseball and track stadiums each seat 2,500. The UCI Tennis Stadium, which seats 500, features 12 courts, six of which are lighted. The campus also has outdoor basketball and volleyball courts (lighted); six indoor four-wall handball/racquetball/squash courts; a swimming pool; and vast recreational fields.

Off-campus facilities include a sailing and crew base in Newport Beach and access to nearby facilities for bowling, roller skating, ice skating, and equestrian use. City and State beaches on the Pacific Ocean are also within minutes of the campus.

Intercollegiate Athletics

The Intercollegiate Athletic Program at UCI features 19 sports, with 11 men's teams, seven women's teams, and one coed sailing team. Information on the Athletic Program may be obtained by contacting the Department of Athletics and Physical Education; telephone (714) 856-6931.

Men's sports include baseball, basketball, crew, cross country, golf, sailing, soccer, swimming, tennis, track and field, volleyball, and water polo.



During the last academic year, the Anteater's Women's Volleyball Team reached the NCAA Division I tournament for the first time in UCI history and was ranked twentieth in the nation.

UCI's men's teams compete in the National Collegiate Athletic Association (NCAA) Division I as a member of the Big West Conference. The Anteater crew and sailing teams compete in the Western Sprint Championships and the Pacific Coast Intercollegiate Yacht Racing Association, respectively. Men's volleyball competes as a member of the Western Intercollegiate Volleyball Association (WIVA).

The UCI women are also in NCAA Division I and compete in basketball, cross country, swimming, tennis, track, and volleyball in the Big West Conference. Soccer and coed sailing are independent sports.

UCI has captured 19 national team championships since opening in 1965, with more than 60 individuals winning national titles and more than 375 earning All-American honors. UCI has won 26 conference championships since 1977: 11 in cross country, seven in tennis, six in water polo,

and two in track and field. UCI has been well-represented by athletes and coaches in Olympic and other international competition.

Courses

The instructional classes emphasize activities and sports that will give students skills necessary to participate in intramurals, sport clubs and intercollegiate competition, and in their adult lives.

1A-B-C Physical Education (0.7 per quarter) F, W, S. May be repeated, beginning through advanced. Activity sections in adaptive physical education, badminton, basketball, bowling, golf, jogging, physical fitness, racquetball, soccer, softball, swimming, tennis, volleyball, and weight training. Intercollegiate athletic sections in baseball, basketball, crew, cross country, golf, sailing, soccer, swimming, tennis, track and field, volleyball, and water polo are offered in season. Pass/Not Pass only.

University Officers

The Regents of the University of California

Regent Ex Officio

Governor of California and President of The Regents

George Deukmejian

Lieutenant Governor of California

Leo T. McCarthy

Speaker of the Assembly

Willie L. Brown

State Superintendent of Public Instruction

Bill Honig

President of the Alumni Association of the University of California

Sherrill D. Luke

Vice President of the Alumni Association of the University of California

Ronald Enomoto

President of the University

David P. Gardner

Appointed Regents¹

Glenn Campbell (1996)

Dean A. Watkins (1996)

Joseph A. Moore (1990)

Vilma S. Martinez (1990)

John F. Henning (1989)

Stanley K. Sheinbaum (1989)

Yori Wada (1992)

Frank W. Clark, Jr. (1988)

Willis W. Harman (1990)

Meredith Khachigian (1990)

Yvonne Brathwaite Burke (1993)

Jacques S. Yeager (1994)

Jeremiah F. Hallisey (1993)

Harold M. Williams (1994)

Guillermo Rodriquez, Jr.

(7/1/89-6/30/90)

Tirso del Junco, M.D. (1997)

Leo J. Kolligian (1997)

William French Smith (1998)

Roy T. Brophy (1998)

Clair W. Burgener (2000)

Regents-Designate²

Walter Hoadley

Martha Newkirk

¹Except for Regents now completing 16-year terms, and the student Regent and alumni Regents appointed annually by the Regents for a one-year term ending on June 30, Regents now serve a term of 12 years, commencing on March 1. The Governor appoints all Regents except the student Regent. Names are arranged in order of original appointment to the Board.

²One-year terms expiring June 30.

Faculty Representatives to The Regents

Chair, Fred N. Spiess (9/1/89-8/31/90)

Vice Chair, Carlton Bovell (9/1/89-8/31/90)

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General Counsel

James E. Holst

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Herbert M. Gordon

Secretary

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Officers Emeriti

General Counsel of The Regents, Emeritus

Thomas J. Cunningham

Associate Counsel of The Regents, Emeritus

John E. Landon

Treasurer of The Regents, Emeritus

Owsley B. Hammond

Vice President, Emeritus; and Secretary and Treasurer of The Regents, Emeritus

Robert M. Underhill

Secretary of The Regents, Emeritus

Marjorie J. Woolman

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Elizabeth O. Hansen

Office of the President

President of the University

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Senior Vice President—Academic Affairs

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Senior Vice President—Administration

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Vice President—Health Affairs

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Vice President—Agriculture and Natural Resources

Kenneth Farrell

Special Assistant to the President

Janet E. Young

Officers Emeriti

President of the University, Emeritus; and Professor of Business Administration, Emeritus

Clark Kerr

President of the University, Emeritus; and Professor of Economics, Emeritus

Charles J. Hitch

President of the University, Emeritus, and Professor of Physics, Emeritus

David S. Saxon

Chancellor Emeritus, Professor of Soils and Plant Nutrition, Developmental and Cell Biology, Ecology and Evolutionary Biology, and Social Ecology, Emeritus

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Chancellor Emeritus and Professor of Statistics, Emeritus

Albert H. Bowker

Chancellor Emeritus and Professor of Botany, Emeritus

Vernon I. Cheadle

Chancellor Emeritus and Professor of Political Science, Emeritus

Ivan H. Hinderaker

Chancellor Emeritus and Professor of Comparative Government, Emeritus

Dean E. McHenry

Chancellor Emeritus and Professor of Animal Science, Emeritus

James H. Meyer

Chancellor Emeritus, University Librarian Emeritus, Professor of Anatomy, Emeritus, and Professor of History of Health Sciences, Emeritus

John B. de C.M. Saunders, M.D.

Chancellor Emeritus, Division of Biology

Robert L. Sinsheimer

Vice President of the University, Emeritus; Professor of Agricultural Economics, Emeritus; and Agricultural Economist, Emeritus

Harry R. Wellman

University Provost, Emeritus; Chancellor at Santa Cruz, Emeritus; and Professor of Mathematics, Emeritus

Angus E. Taylor

Vice President of the University Emeritus and Professor of Physics, Emeritus

William P. Fretter

Vice President—Agriculture and Natural Resources, Emeritus and Professor, Emeritus

James B. Kendrick, Jr.

Vice President—Budget Plans and Relations for the University, Emeritus

Thomas E. Jenkins

Vice President—Financial and Business Management, Emeritus, and Professor of Pathology, Emeritus

Baldwin G. Lamson, M.D.

Vice President—Physical Planning and Construction, Emeritus

Elmo R. Morgan

Assistant President, Emeritus

Dorothy E. Everett

University Auditor, Emeritus

Norman H. Gross

Special Assistant to the President Health Affairs, Emeritus

Clinton C. Powell, M.D.

Assistant Vice President, Emeritus

Loren Furtado

Director of the University Press, Emeritus

August Fruge

Coordinator, Administrative Policy, Emeritus

Ruth E. Byrne

Executive Assistant to the President, Emeritus

Gloria L. Copeland

Chancellors

Chancellor at Berkeley
Ira Michael Heyman
Chancellor at Davis
Theodore Hullar
Chancellor at Irvine
Jack W. Peltason
Chancellor at Los Angeles
Charles E. Young
Chancellor at Riverside
Rosemary Schraer

Chancellor at San Diego
Richard C. Atkinson
Chancellor at San Francisco
Julius R. Krevans
Chancellor at Santa Barbara
Barbara S. Uehling
Chancellor at Santa Cruz
Robert Bocking Stevens

UCI Principal Administrative Officers

Chancellor—Jack W. Peltason
Executive Vice Chancellor—Chang-Lin Tien
Associate Executive Vice Chancellor—William H. Parker
Associate Vice Chancellor Academic Plans and Programs—
Mary-Louise Kean
Assistant Executive Vice Chancellor Financial Planning—
Roy E. Dormaier
Assistant Vice Chancellor Academic Affairs—Dennis J.
Galligani
Assistant Vice Chancellor Administrative Affairs and Academic Personnel—Loraine Reed
Assistant Vice Chancellor Budget—Lewis L. Bird, Jr.
Assistant Vice Chancellor Student Affirmative Action—
Manuel N. Gomez
Assistant Vice Chancellor—University Ombudsman—Ronald
W. Wilson
Dean of Graduate Studies—Paul S. Sypherd
Dean of Undergraduate Studies—Michael D. Butler (Acting)
Faculty Assistant for Academic Affirmative Action—Aliko
Songolo
Faculty Assistant for International Affairs—Eloy Rodriguez
Vice Chancellor Student Affairs—Horace Mitchell
Associate Vice Chancellor Student Affairs—Charles R.
Pieper
Assistant Vice Chancellor Student Affairs—James B. Craig
Dean of Students—Sally K. Peterson
Vice Chancellor Administrative and Business Services—Leon
M. Schwartz
**Associate Vice Chancellor Administrative and Business
Services**—C. Michael Webster
Associate Vice Chancellor Physical Planning—Leon M.
Schwartz (Acting)
Vice Chancellor Health Sciences—Walter L. Henry
Vice Chancellor Research—Paul S. Sypherd
Vice Chancellor University Advancement—John R. Miltner
Associate Vice Chancellor University Advancement—
Kathleen T. Jones
**Assistant Vice Chancellor Affirmative Action and Equal
Opportunity**—Carla R. Espinoza

For a complete list of UCI administrative officers, please refer to the *University of California Telephone Directory* or the *UCI Campus and Medical Directory*. The Telephone Guide in this Catalogue (see p. 14) may be consulted for telephone numbers of various campus offices.

University Professors

E. Margaret Burbidge, University Professor
University of California, San Diego
Melvin Calvin, University Professor Emeritus
University of California, Berkeley
Gerard Debreu, University Professor
University of California, Berkeley
Amos Funkenstein, University Professor
University of California, Los Angeles
Murray Krieger, University Professor
University of California, Irvine
Glenn Seaborg, University Professor Emeritus
University of California, Berkeley
Julian S. Schwinger, University Professor
University of California, Los Angeles

Neil Smelser, University Professor
University of California, Berkeley
Edward Teller, University Professor Emeritus
Lawrence Livermore National Laboratory
Charles Townes, University Professor
University of California, Berkeley
Sherwood Washburn, University Professor Emeritus
University of California, Berkeley
John R. Whinnery, University Professor
University of California, Berkeley

UCI Distinguished Professors

Francisco Ayala, Ph.D., Distinguished Professor of Ecology and Evolutionary Biology
William E. Bunney, Jr., M.D., Department Chair and Distinguished Professor of Psychiatry and Human Behavior
David Easton, Ph.D., Distinguished Professor of Political Science
Harry Eckstein, Ph.D., Distinguished Professor of Political Science
R. Duncan Luce, Ph.D., Director of the Irvine Research Unit in Mathematical Behavioral Science and Distinguished Professor of Cognitive Science
Ricardo Miledi, M.D., Distinguished Professor of Psychobiology
J. Hillis Miller, Ph.D., Distinguished Professor of English and Comparative Literature
Chang-Lin Tien, Ph.D., Executive Vice Chancellor and Distinguished Professor of Mechanical Engineering

UCI Endowed Chairs

Daniel G. Aldrich, Jr. Chair
F. Sherwood Rowland, Ph.D., Professor of Chemistry
Grace Bell Chair in Biochemistry
Masayasu Nomura, Ph.D., Professor of Biological Chemistry, Microbiology and Molecular Genetics, and Biological Sciences
FHP Foundation Chair in Health Care Management
Paul J. Feldstein, Ph.D., Professor of Management
Dorothy Marsh Chair in Reproductive Biology
Philip J. DiSaia, M.D., Professor of Obstetrics and Gynecology and of Radiological Sciences
UCI Presidential Chair
Peter M. Rentzepis, Ph.D., Professor of Chemistry

Student Conduct and Discipline

Students enrolling in the University are expected to assume an obligation to conduct themselves in a manner compatible with the University's function as an educational institution. A handbook is available which sets forth standards of conduct expected of UCI students. This booklet, "Policies Applying to Campus Activities, Organizations, and Students," gives rules concerning conduct and related matters, as established by the policies of the Regents and the President of the University. The booklet also incorporates campus regulations. Copies are available from the University Ombudsman, located in 255 Administration Building; from the Dean of Students, located in Student Services I, and from the Student Activities Office, located in 901 Humanities Trailer Complex.

Academic Dishonesty

The UCI Academic Senate adopted the following policies on academic dishonesty on June 2, 1988.

Academic dishonesty is unacceptable and will not be tolerated at the University of California, Irvine. Cheating, forgery, dishonest conduct, plagiarism, and collusion in dishonest activities erode the University's educational, research, and social roles. They cheapen the learning experience and its legitimacy not only for the perpetrators but for the entire community. It is essential that UCI students subscribe to the ideal of academic integrity and accept individual responsibility for their work.

All members of the academic community have a responsibility to ensure that scholastic honesty is maintained. Cheating and plagiarism are unfair, demoralizing, and demeaning to everyone.

Faculty members are expected to:

1. Uphold and enforce the principles of academic integrity and explain clearly any qualifications of these principles which may be operative in the classes they are teaching.
2. Minimize opportunities for academic misconduct in their courses.
3. Confront students suspected of academic dishonesty in a way which respects the students' privacy.
4. Afford to students accused of academic misconduct the right to appeal any resulting disputes to disinterested parties for hearing and resolution.

Students are expected to:

1. Refrain from cheating and plagiarism.
2. Refuse to aid or abet any form of academic dishonesty.
3. Notify professors and/or appropriate administrative officials about observed incidents of academic misconduct.

Academic dishonesty includes but is not limited to the following examples:

Cheating

1. Copying from others during an examination.
2. Communicating exam answers with another student during an examination.
3. Offering another person's work as one's own.
4. Taking an examination for another student or having someone take an examination for oneself.
5. Sharing answers for a take-home examination unless specifically authorized by the instructor.
6. Tampering with an examination after it has been corrected, then returning it for more credit.
7. Using unauthorized materials, prepared answers, written notes or information concealed in a blue book, or elsewhere during an examination.
8. Allowing others to do the research and writing of an assigned paper (including use of the services of a commercial term-paper company).

Dishonest Conduct

1. Stealing or attempting to steal an examination or answer key from the instructor.
2. Changing or attempting to change official academic records without proper sanction.
3. Submitting substantial portions of the same work for credit in more than one course without consulting all instructors involved.
4. Forging Add/Drop/Change cards and other enrollment documents, or altering such documents after signatures have been obtained.
5. Intentionally impairing the concentration of other students and/or the faculty member.

Plagiarism

Plagiarism is intellectual theft. It means use of the intellectual creations of another without proper attribution. Plagiarism may take two main forms, which are clearly related:

1. To steal or pass off as one's own the ideas or words of another.
2. To use a creative production without crediting the source.

Credit *must* be given for every direct quotation, for paraphrasing or summarizing a work (in whole, or in part, in one's own words), and for information which is not common knowledge.

The UCI Academic Senate has adopted a statement regarding plagiarism which is published each quarter in the UCI *Schedule of Classes*.

Collusion

Any student who knowingly or intentionally helps another student perform any of the above acts of cheating or plagiarism is subject to discipline for academic dishonesty.

Procedures for Dealing with Incidents of Academic Dishonesty

Many, perhaps most, incidents of academic dishonesty involve accusations which are based on clear evidence and which are not contested by the accused student. In such cases, if the infraction is relatively minor and there is no indication that the accused student has previously been involved in such incidents, it is most appropriate that the matter be resolved between the student and the faculty member alone. When this occurs, it is nevertheless important that a written report of the incident be filed in order to ensure that penalties assessed are commensurate with the offense and that repeated infractions be detected and dealt with appropriately.

More serious incidents and repeat offenses, which call for stronger disciplinary action, will necessarily involve members of the University community in addition to the instructor and accused student. In such cases sanctions described in paragraph 52.130 of *Policies Applying to Campus Activities, Organizations, and Students-Part A* may be administered by the office of the Vice Chancellor of Student Affairs in addition to academic penalties assessed by a faculty member.

Finally, whenever an accusation of academic dishonesty or a penalty imposed by a faculty member is contested by an accused student, the student must have recourse to an appeal for resolution of the dispute to designated arbitrators or, in the last resort, to a properly constituted review panel. Processes for informal resolution by the Office of the Vice Chancellor—Student Affairs and for formal resolution before a Student/Faculty Board of Review are described in paragraph 52.122 of the publication just cited. Additional avenues of appeal are described below.

The procedures outlined here are designed to institute a system that recognizes that many cases of academic misconduct are best resolved solely between the student and faculty member involved, while it provides for appropriate handling of serious and repeated offenses and guarantees a fair hearing to an accused student.

Authority of Faculty Members

When a faculty member has evidence of student academic dishonesty, the faculty member has the authority to impose one or more of the following academic penalties, if possible following a private meeting with the student to present the evidence:

1. Issue a reprimand.
2. Require repetition of the questionable work or examination.
3. Reduce the grade to an F or zero, if appropriate, on the questionable work or examination.
4. Dismiss the student from the course with a failing grade recorded on the student's permanent academic record.

Any such disciplinary action must be reported in writing to the student in a letter from the faculty member. Copies of this letter must also be sent to (a) the Associate Dean of the faculty member's school, and (b) the Associate Dean of the student's school, who will maintain a file of cases of academic misconduct involving students enrolled in that school. The faculty member is strongly encouraged to consult with the Associate Dean of their school before the letter is drafted. Reference to (or a copy of) the UCI Academic Senate Policies on Academic Dishonesty should be included in the letter. If action (4) is taken, the faculty member is responsible for making certain that the failure is recorded by the Registrar on the student's permanent academic record. The academic penalty imposed by the instructor is final unless appealed by the student within 15 calendar days of mailing of the letter. Careful documentation of the incident must be maintained by the faculty member in the event that their actions in the case should later be subject to review.

Responsibilities of the Academic Associate Deans

The Associate Dean (or equivalent official) of each school is responsible for maintaining confidential records concerning academic dishonesty of students enrolled in that school. All letters reporting faculty-imposed academic penalties for academic misconduct will be included in these files, and the Associate Dean will be responsible for identifying serious incidents of academic misconduct perpetrated by students enrolled in that school as they occur. Such serious incidents of academic dishonesty, including all incidents which represent repeated offenses by a student, must be referred by the Associate Dean of the accused student's school to the University Ombudsman for possible imposition of sanctions described in policy 52.130, including suspension or dismissal from the University.

The Associate Dean of an accused student's school is required to notify that student of the appeal process available to students accused of academic dishonesty promptly upon receipt of an instructor's letter reporting faculty-imposed academic sanctions.

Authority of the Vice Chancellor—Student Affairs

Whenever an incident of academic misconduct is referred to the University Ombudsman by an academic Associate Dean, the Ombudsman will investigate the circumstances of the incident following procedures specified under campus policy 52.122 and attempt an informal resolution of the case. In the event that the Ombudsman fails to achieve informal resolution of the matter, the Dean of Students will convene a Student/Faculty Board of Review for formal resolution of the case. Formal or informal resolution under the authority of the Vice Chancellor—Student Affairs may result in the withdrawal of all charges against the student or endorsement of the academic penalties imposed by the faculty member and possible imposition of one or more of the sanctions described in policy 52.130, including suspension or dismissal from the University.

Student Appeals

When any student accused of academic dishonesty wishes to contest a sanction imposed by a faculty member, the student may, within 15 calendar days of the mailing of written notification of the academic penalty, submit an appeal in writing to the Associate Dean of the instructor's school. The Associate Dean will promptly attempt to mediate the dispute and reach a resolution. The result of a successful mediation will be reported in writing by the instructor to the student, and to the Associate Deans of both the faculty member's school and the student's school. If the mediation process does not succeed within 10 calendar days following appeal of the matter to the Associate Dean of the instructor's school, the matter must be forwarded by the Associate Dean to the University Ombudsman for resolution under the procedures of policy 52.00ff.

A student accused of academic dishonesty may, within 30 calendar days of the mailing of the initial letter detailing academic sanctions imposed by a faculty member for an incident of academic dishonesty, appeal the matter in writing to the University Ombudsman, who will seek to resolve the dispute under the procedures of policy 52.00ff.

Students accused of academic dishonesty or considering an appeal of academic sanctions for alleged academic misconduct are urged to contact the Associate Dean of their academic school and/or the University Ombudsman concerning possible sources of advice and assistance.

Maintenance of Disciplinary Records

Records relating to academic dishonesty will be maintained by the Associate Deans (or corresponding officials) of the several academic units primarily to promote consistency of penalties for a given offense and to ensure appropriate action against repeat offenders. Records will normally be destroyed after five years, unless the Associate Dean determines in any particular case that there is good reason to extend the period of retention. In order to ensure that minor and non-recurring infractions do not negatively impact a student's career beyond UCI, any student may petition the Associate Dean of their academic school to have relevant disciplinary records expunged after the record is two years old or upon graduation, whichever comes first. The Associate Dean has sole authority to consider and to grant or deny such petitions. The University will release a student's disciplinary records to potential employers, governmental agencies, other educational institutions, or other

organizations or individuals only if authorized to do so by the student in question or if compelled by law.

Acknowledgment

The information above was inspired both in format and content by a University of California, Santa Barbara publication.

The UCI publication *Policies Applying to Campus Activities, Organizations, and Students-Part A* provides additional details about the implementation of procedures specified above. Copies are available from the Office of Student Affairs, 260 Administration Building.

Anti-Hazing Compliance

The State of California and the University of California have expressly and repeatedly asserted their opposition to hazing and preinitiation activities which do not contribute to the positive development and welfare of the individuals involved. In January 1988, the Education Code of the State of California was modified to reflect changes to the State's anti-hazing statute. In accordance with the revised Education Code, students are advised of the following:

Education Code 32050

As used in this article, hazing includes any method of initiation or preinitiation into a student organization or any pastime or amusement engaged in with respect to such an organization which causes, or is likely to cause, bodily danger, physical harm, or personal degradation or disgrace resulting in physical or mental harm, to any student or other person attending any school, community college, college, university, or other educational institutions in this state; but the term "hazing" does not include customary athletic events or other similar contests or competitions.

Education Code 32051

No student, or other person in attendance at any public, private, parochial, or military school, community college, college, or other educational institution, shall conspire to engage in hazing, participate in hazing, or commit any act that causes or is likely to cause bodily danger, physical harm, or personal degradation or disgrace resulting in physical or mental harm to any fellow student or person attending the institution.

The violation of this section is a misdemeanor, punishable by a fine of not less than one hundred dollars (\$100), nor more than five thousand dollars (\$5,000), or imprisonment in the county jail for not more than one year, or both.

Education Code 32052

Any person who participates in the hazing of another, or any corporation or association which knowingly permits hazing to be conducted by its members or by others subject to its direction or control, shall forfeit any entitlement to State funds, scholarships, or awards which are enjoyed by him, by her, or by it, and shall be deprived of any sanction or approval granted by any public educational institution or agency.

Copies of Sections 32050 through 32052 as well as UCI's policies regarding hazing are available from the Office of the Dean of Students, Student Services Building.

Student Records

The University of California campuses maintain various types of records pertaining to students; some are maintained for academic purposes; others, such as hospital and employment records, are maintained for other specific purposes. Student records—that is, those pertaining to students in their capacity as students—include but are not limited to academic evaluations, transcripts, test scores and other academic records, general counseling and advising records, disciplinary records, and financial aid records.

The disclosure of information from student records is governed in large measure by the Federal Family Educational Rights and Privacy Act of 1974, by the State of California Education Code, and by University policy and procedures implementing these laws which protect the student's right of privacy, provide safeguards for the confidentiality of student records, and permit students access to their own records.

Pursuant to the Federal Family Educational Rights and Privacy Act of 1974 and the University of California Policies Applying to the Disclosure of Information from Student Records, students at the University have the following five rights:

1. to inspect and review records pertaining to themselves in their capacity as students;
2. to inspect records maintained by the campus of disclosure of personally identifiable information from their student records;
3. to seek correction of their student records through a request to amend the records or a request for a hearing;
4. to file complaints with the Department of Health and Human Services regarding alleged violations of the rights accorded them by the Act; and
5. to have withheld from disclosure, in the absence of their prior consent for release, personally identifiable information from their student records, with exceptions as noted in the University student records policies.

NOTE: There are instances in which information can be disclosed without prior written consent of the student. University officials may require access to student records in the course of the performance of their assigned duties. Further, confidential information can be disclosed without prior written consent of the student (a) in connection with conditions of certain financial aid awards; (b) when the campus is complying with a judicial order or subpoena; and (c) when authorized federal or State officials are conducting an audit or evaluation of federally supported educational programs. There are also other situations in which the University is required to disclose information. See Policies Applying to Campus Activities, Organizations, and Students, Part B, Section 10.721 for a list of exceptions.

Normally, the campus will release the following as personally identifiable information which can be made public:

Student's name;
Address (campus, local, and/or permanent) and telephone numbers;
Date and place of birth;
Major field of study, dates of attendance, degrees and honors received;
Most recent previous educational institution attended;

Participation in officially recognized activities, including intercollegiate athletics;

Name, weight, and height of participants on intercollegiate University athletic teams.

However, students have the right to refuse to permit any or all of these categories to be designated public information with respect to themselves. (See the NOTE above.)

If a student requests that information from his or her records not be regarded as public information, then the information will not be released to anyone without the written consent of the student. The student should be aware of the important implications of exercising this right. For example, if a request is made to withhold from disclosure a student's name and degrees and honors received, the campus cannot release for publication information on any honors received by the student, such as election to Phi Beta Kappa, and cannot include the student's name and degree earned in the campus commencement program without the written consent of the student. Similarly, if a request is made to withhold from disclosure a student's name and dates of attendance, a student's status as a student cannot be verified for potential employers without the written consent of the student. Further, if a student's last instruction to the campus was to withhold from disclosure the degree granted to that student and the date on which the degree was conferred, that information cannot be confirmed for a third party in connection with the appointment of that graduate to a new position or in connection with an honor that individual received without the written consent of the student.

Students wishing to restrict release of public information should contact the Registrar's Office for instructions on how to do so. Questions regarding the rights of students under the University policies and the federal law should be directed to the Vice Chancellor Student Affairs or that person's designee, 260 Administration.

A Personal Data Sheet is included in each quarter's registration packet which allows students to examine and update their personal data. Furthermore, during the eighth week of classes, every student is provided with a record of current term enrollment as part of his or her registration materials for the next quarter to ensure the accuracy of official enrollment. Students are urged to report officially to the Registrar's Office all changes in personal data and enrollment data. It is extremely important for each student to keep the Registrar's Office currently informed as changes occur to assure that accurate and complete records are maintained.

Students are informed annually of their rights under the University's student records policies and the federal Act. Copies of the Act and University and campus policies are available for review in the Reference Room, Main Library. In addition, University policies are published in the booklet "Policies Applying to Campus Activities, Organizations, and Students—Part B," copies of which are available in the Student Activities Office.

Complaints regarding alleged violation of the rights accorded students by the federal Act may be filed with the Family Educational Rights and Privacy Act Office (FERPA), Department of Education, 4511 Switzer Building, Washington, D.C. 20202.

As required by Section 177.64 of the federal regulations governing the Guaranteed Student Loan Program, published in the Federal Register on February 20, 1975, the following information concerning salary and employment data is provided:

Salary and Employment Information¹

Field of Study	Degree Level of Graduates		
	Bachelor's	Master's	Doctorate
	Average Monthly Salary		
Engineering	\$2,342	\$2,738	\$3,837
Humanities	1,575	—	—
Life Science	1,631	1,709	1,944
Management	—	2,515	—
Physical Science	1,968	2,525	3,140
Social Science	1,693	1,943	—

¹Source: A national survey of a representative group of colleges conducted by the College Placement Council, representing the 80 percent range of offers for March 1988 throughout the country. It should be noted that a wide variation in starting salaries exists within each discipline based on job location, type of employer, personal qualifications of the individual, and employment conditions at the time of job entry.

Student Records

Types and locations of major student records maintained by the campus are listed in the following table; consult the Campus Directory or building directories for room numbers.

Type of Record School, department, or program	Location of Record Administrative office for particular unit	Responsible Official Dean, Chair, or Director
Admissions—Undergraduate	Administration	Director, Admissions
Admissions—Graduate	Administration	Dean, Graduate Studies
Admissions—College of Medicine	Med. Sci. I	Director, Admissions
Career Planning and Placement	Student Services I	Director, Career Planning and Placement
Cashier's Office	Administration	Cashier
Child Care Services	Early Childhood Education Center	Director, Child Care Services
Collection	Administration	Collections Manager
Counseling	Student Services I	Director, Counseling Services
Disabled Student Services	Disabled Student Services	Director, Disabled Student Services
Education Abroad Program	Student Services	Coordinator, EAP
Educational Opportunity Program	Administration	Coordinator, EOP
Financial Aid	Administration	Director, Financial Aid
Housing	Housing Administrative Services	Director, Housing
International Services	Administration	Assistant Dean, International Students
Learning Skills Center	Student Services II	Director, Learning Skills Center
Ombudsman Services	Administration	University Ombudsman
Parking	Public Services Facility	Parking Supervisor
Registrar— Graduate/Undergraduate	Administration	Registrar
College of Medicine	Med. Sci. I	Assistant Deputy Registrar
Relations with Schools and Colleges	Administration	Director, Relations with Schools and Colleges
Student Academic Advancement Services	Student Services II	Director, Student Academic Advancement Services
Student Conduct	Student Services	Dean of Students
Student Health	Student Health Center	Director, Student Health
Summer Session	University Extension Facility	Director, Summer Session
Tutorial Assistance Program	Student Services II	Director, Tutorial Assistance Program
Undergraduate Studies	Administration	Dean, Undergraduate Studies
University Extension	University Extension Facility	Dean, University Extension
Veterans	Administration	Coordinator, Veterans Affairs
Incidental Records (minutes of various committees, copies of correspondence in offices not listed above, and other records not listed)	Administration	Vice Chancellor Student Affairs, or other Student Affairs official

How to Obtain the Catalogue

Copies of the 1989-90 UCI General Catalogue are available for \$4.50 from several outlets which are open Monday through Friday. Outlets include the University Bookstore, the Cashier's Office, and University Extension.

Catalogues are available by mail: \$7.50 to U.S. destinations, \$16.00 to foreign destinations. Checks, made payable to UC Regents, should be sent to the Cashier's Office, Administration Building, University of California, Irvine; Irvine, California 92717.

Nondiscrimination Statement. The University of California, Irvine, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Sections 503 and 504 of the Rehabilitation Act of 1973, does not discriminate on the basis of race, color, national origin, religion, handicap, or sex in any of its policies, procedures, or practices. In accordance with sex discrimination laws, the University of California forbids acts of sexual harassment. The University, in compliance with the Age Discrimination in Employment Act of 1967, Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, and Section 12940 of the State of California Government Code, does not discriminate against any employees or applicants for employment on the basis of their age, or because they are disabled veterans or veterans of the Vietnam era, or because of their medical condition (as defined in Section 12926 of the California Government Code), their ancestry, or their citizenship or sexual orientation, within the limits imposed by law or University policy. This nondiscrimination policy covers admission, access, and service in University programs and activities, and application for and treatment in University employment.

In conformance with University policy and pursuant to Executive Orders 11246 and 11375, Section 503 of the Rehabilitation Act of 1973, and Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, the University of California is an affirmative action/equal opportunity employer.

Inquiries regarding the University's equal opportunity policies may be directed to Carla R. Espinoza, Assistant Vice Chancellor, Affirmative Action and Equal Opportunity, 524 Administration, University of California, Irvine; Irvine, California 92717, telephone (714) 856-5594.

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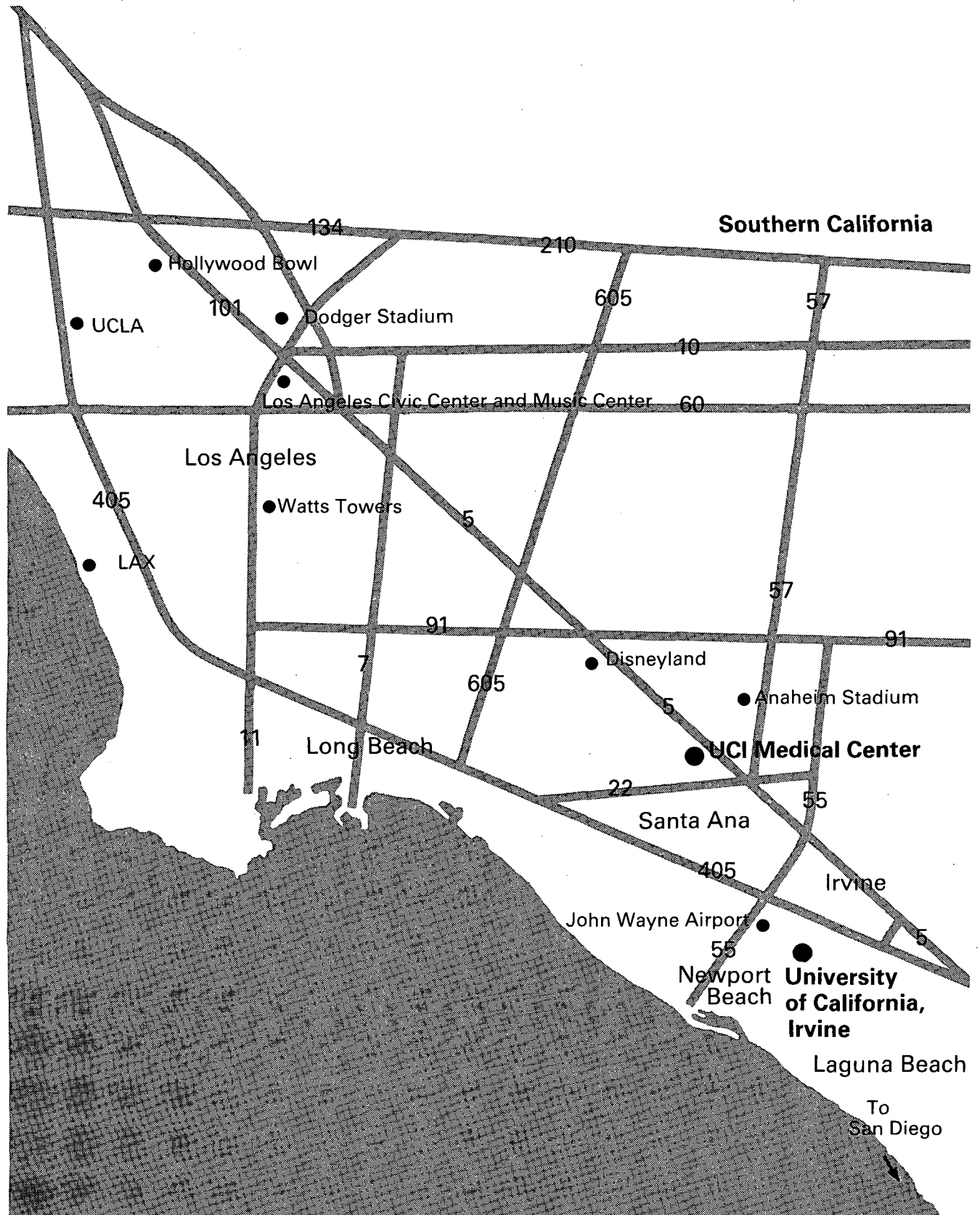
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* Scheduled to open fall 1989

CV & ID Card Building

Abbreviations

ART	Art Studio
CDC	Child Development Center (North Campus)
CH	Crawford Hall
CNLM	Center for the Neurobiology of Learning and Memory
CON	Concert Hall
CS	Computer Science
DS	Dance Studio
EDW CIN	Edwards Cinemas
EGR	Engineering
FA	Fine Arts
FAT	Fine Arts Trailer
GAL	Art Gallery
GSM	Graduate School of Management
HH	Humanities Hall
HICF	Humanities Interim Classroom Facility
HOB	Humanities Office Building
ICF	Interim Classroom Facility
IJERF	ICS/Engineering Research Facility
MSI	Medical Surge I
MSII	Medical Surge II
MSB	Medical Sciences, Buildings A through F
MUS	Music
PRS	Production Studio
PS	Physical Sciences
PSCF	Physical Sciences Classroom Facility
PSLH	Physical Sciences Lecture Hall
PST	Physical Sciences Trailers
REC	Rockwell Engineering Center
SCS	Sculpture Studio
SE	Social Ecology
SH	Steinhaus Hall
SLH	Science Lecture Hall
SSH	Social Science Hall
SSL	Social Science Laboratory
SST	Social Science Tower
VLGE	Village Theatre
UNEX	University Extension Building

P = Parking Lots. Parking may not be available in some lots due to construction. Metered sections available for visitor parking in lots 1, 6, 13, 18A, 19, 80, and North Campus parking lot 90. Permit required for nonmetered spaces. Permit dispensers are located at the three main entrances to the campus: on Bridge at Campus, on Berkeley at Campus, and on California at University.

† = Parking structure scheduled to open winter 1990.

★ = Parking Permit Dispensers

● = Bus Stops

Shaded roads and parking areas are open to public and auto travel.

All buildings are accessible to wheelchairs. Specific information may be obtained from the Disabled Student Services Office, (714) 856-6487.

**School of
Biological
Sciences**

**School of Fine
Arts**

**School of
Humanities**

**School of
Physical
Sciences**

**School of Social
Sciences**

**Department of
Information and
Computer
Science**

**Program in
Social Ecology**

**School of
Engineering**

**Graduate
School of
Management**

**Teacher
Education**

**College of
Medicine**

**Department of
Athletics and
Physical
Education**

