

# GENERAL CATALOG

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MAY 1970 LOS ANGELES

# UCLA

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## GENERAL INFORMATION

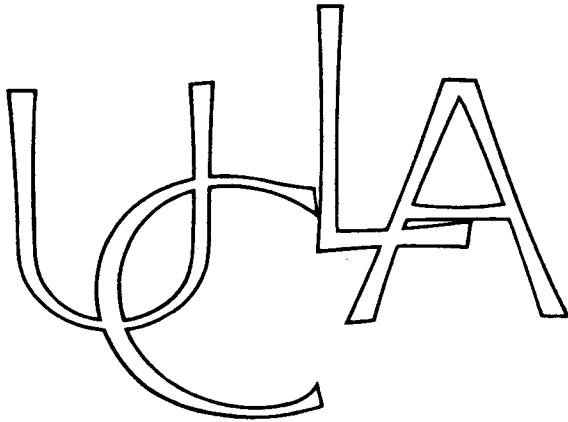
Letters of inquiry concerning the University of California, Los Angeles, should be addressed to the Office of Admissions, University of California, 405 Hilgard Avenue, Los Angeles, California 90024.

Letters of inquiry concerning the University in general should be addressed to the Registrar, University of California, Berkeley, California 94720.

For the list of bulletins of information concerning the several colleges and departments, see page 3 of the cover of this bulletin.

In writing for information please mention the college, department, or study in which you are chiefly interested.

The registered cable address of the University of California, Los Angeles, is UCLA.



**GENERAL  
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1970-1971 ISSUE**  
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LOS ANGELES

MAY 3, 1970

PRICE: ONE DOLLAR

# **An Exciting Endeavor**

Now that UCLA has celebrated its 50th anniversary, it can be rightly regarded as a mature rather than as a growing campus. There has long been concern with quality, but we have been constrained by problems of coping with sheer growth of the student body, the faculty and the physical plant.

As we enter the 1970's, we are freer to focus in a more concentrated way on quality of faculty and expanded opportunity for students. Although UCLA is one of the dozen or so most distinguished institutions of higher learning in the United States, we shall not be content until it is at the very top.

We invite you to join us in this exciting endeavor and to take advantage of a wide selection of educational and cultural riches. Should you decide to do so, we will do everything possible to make your stay here intellectually stimulating and personally enjoyable.

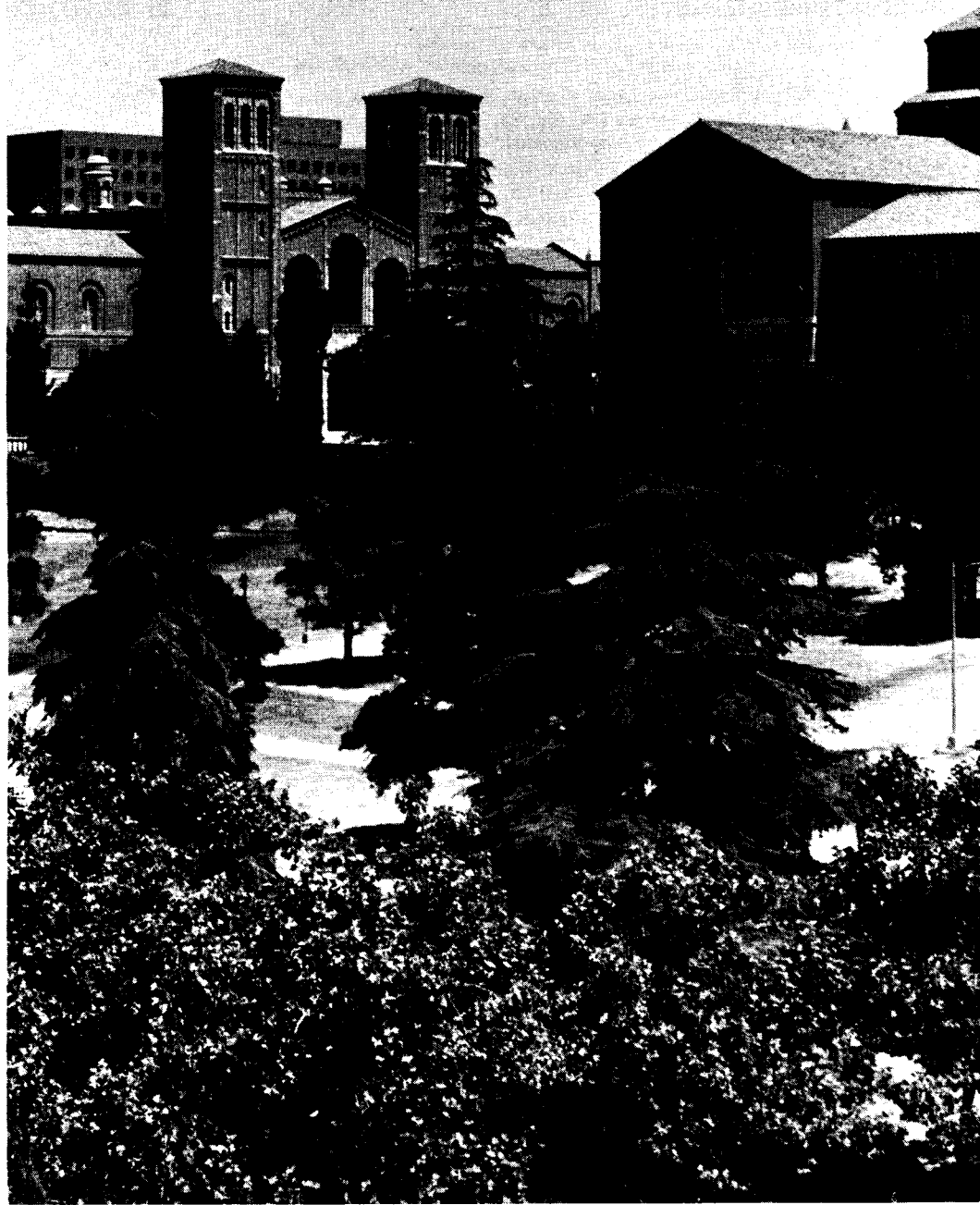
**Charles E. Young**  
**Chancellor**

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# Calendar

	Fall '70	Winter '71	Spring '71
First day to file application for undergraduate standing. (Last day will depend on the number of applications received.)	Oct. 1 Thursday	May 1 Saturday	Aug. 1 Sunday
*Application for admission to graduate standing, with complete credentials and the application fee, must be filed with the Admissions Section of the Graduate Division on or before this date.	May 15 Friday	Oct. 15 Thursday	Jan. 15 Friday
Last day to file application with Registrar for readmission in undergraduate standing.	Aug. 14 Friday	Nov. 20 Friday	Feb. 12 Friday
Last day to file application with Graduate Division for readmission in graduate standing.	Apr. 15 Wednesday	Oct. 15 Thursday	Oct. 15 Thursday
Counseling of students by appointment.	Sept. 16– Sept. 23 Wednesday– Wednesday	Dec. 28– Dec. 29 Monday– Tuesday	Mar. 22– Mar. 25 Monday– Thursday
Entrance Examination in English as a Second Language.	Sept. 23 Wednesday	Jan. 4 Monday	Mar. 25 Thursday
Physical Evaluation dates for new and re-entering students.	Sept. 24–25 and Sept. 28– Oct. 2	Jan. 4–5 Monday– Tuesday	Mar. 29–30 Monday– Tuesday
Quarter begins.	Sept. 28 Monday	Jan. 4 Monday	Mar. 29 Monday
†Registration in Person.	Sept. 28– Oct. 2 Monday– Friday	Jan. 4– Jan. 5 Monday– Tuesday	Mar. 29– Mar. 30 Monday– Tuesday
Examination in Subject A English Placement Test (for transfer students).	Sept. 28 Monday	Jan. 4 Monday	Mar. 29 Monday
Instruction begins.	Oct. 5 Monday	Jan. 6 Wednesday	March 31 Wednesday
Last day to file applications for advancement to candidacy for the master's degree to be conferred 1970–1971.	Oct. 12 Monday	Jan. 18 Monday	Apr. 12 Monday
Last day to file study lists without fee.	Oct. 16 Friday	Jan. 19 Tuesday	Apr. 13 Tuesday
Last day for late registration. Before 2:00 p.m.	Oct. 16 Friday	Jan. 19 Tuesday	Apr. 13 Tuesday
Last day to pay course Subject A fee without lapse of status. Before 3:50 p.m.	Oct. 16 Friday	Jan. 19 Tuesday	Apr. 13 Tuesday
Last day to add courses to study lists. Before 3:50 p.m.	Oct. 21 Wednesday	Jan. 22 Friday	Apr. 16 Friday

\* Also last date for renewal of applications to be submitted by graduate students who have applied but who did not previously register for a regular quarter.

† For details; see Registration Circular and official bulletin boards. A \$10.00 Late Registration Fee is assessed after these dates.

	Fall '70	Winter '71	Spring '71
Last day for undergraduate students to drop courses from study lists without penalty of grade F (failure). Before 3:50 p.m.	Oct. 30 Friday	Feb. 2 Tuesday	Apr. 27 Tuesday
§Last day to file notice of candidacy for the bachelor's degree to be conferred 1970-1971.	Nov. 6 Friday	Feb. 9 Tuesday	May 4 Tuesday
Last day to submit final drafts of dissertations to doctoral committees for degrees to be conferred 1970-1971.	Nov. 9 Monday	Feb. 10 Wednesday	May 4 Tuesday
Last day for graduate students to drop courses from study lists without penalty of grade F (failure). Before 3:50 p.m.	Nov. 16 Monday	Feb. 17 Wednesday	May 14 Friday
Last day to submit final drafts of theses to master's committees for degrees to be conferred 1970-1971.	Nov. 30 Monday	March 1 Monday	May 25 Tuesday
Last day to file with the Dean of the Graduate Division completed copies of theses for the master's degree and dissertation for the doctor's degree to be conferred 1970-1971.	Dec. 9 Wednesday	March 10 Wednesday	June 4 Friday
Instruction ends.	Dec. 12 Saturday	Mar. 13 Saturday	June 7 Monday
Final examinations.	Dec. 14-19 Monday-Saturday	Mar. 15-20 Monday-Saturday	June 9-15 Wednesday-Tuesday
Quarter ends.	Dec. 19 Saturday	Mar. 20 Saturday	June 15 Tuesday
Last day for continuing students to file applications for undergraduate scholarships for 1971-1972.		Jan. 15 Friday	
Last day to file applications for fellowships and graduate scholarships tenable at Los Angeles for 1971-1972.		Jan. 31 Sunday	
Academic and Administrative Holidays.	Sept. 7 Monday	Feb. 15 Monday	May 31 Monday
	Nov. 26-27 Thursday-Friday	Mar. 26 Friday	
	Dec. 24-25 Thursday-Friday		
	Dec. 31-Jan. 1 Thursday-Friday		

§ Notice of candidacy will be taken after this date only if degree check can be completed on an emergency basis. If accepted, there is a fee of \$3.00.



# The University

## AN INTRODUCTION

The University of California was established in 1868. Initially located in Oakland, it moved to its first campus, Berkeley, in 1873. Today, along with the Berkeley campus, the University has campuses at Los Angeles, Davis, San Francisco, Santa Barbara, Riverside, San Diego, Irvine (in Orange County) and Santa Cruz.

Instruction on these campuses covers all of the broad and essential areas of human knowledge, including the arts, sciences and literature. Each of the campuses has its own organization, objectives, and style of academic life. Each offers a unique set of programs and facilities; yet each cooperates to insure a maximum of opportunity for the student and a maximum of flexibility in fulfilling his plans.

The University is keeping pace with the growth of the State. Recent state-wide enrollment approached 100,000. Adult education programs are conducted by University of California Extension through classes in approximately 230 communities in the State, and through films, television courses and correspondence. The University maintains an Agricultural Extension Service. And its Education Abroad Program offers opportunities to its undergraduate students to study in universities in other countries.

The University is governed by a Board of Regents. The Regents appoint the President of the University, who is the executive head of the University, and with his advice appoint the Chancellors, directors and deans who administer the affairs of the individual campuses and divisions of the University. The Academic Senate, subject to the approval of the Regents, determines conditions for admission of students, and for the granting of certificates and degrees. It also authorizes and supervises all courses of instruction in the academic and professional colleges and schools, except in professional schools offering work at the graduate level.

## UCLA

### History and Development

UCLA—The University of California, Los Angeles—is located in the Westwood Hills in western Los Angeles. Academically ranked among the leading universities in the United States, it has attracted distinguished scholars and research men from all over the world.

UCLA was created on May 23, 1919, when Governor William D. Stephens signed legislation transferring buildings, grounds and records of the State Normal School on North Vermont Avenue to the University of California.

The newly created institution opened its doors to 250 students in September, 1919, as the "Southern Branch" of the University of California. The curriculum included courses in the freshman and sophomore years in letters and science and in teacher-training. In 1922 the teacher-training courses were organized

as a Teachers College, and 1923 and 1924, respectively, the third and fourth years of Letters and Science were added.

It soon became evident that a new home would be needed. On March 21, 1925, the present Westwood site—then consisting of 383 acres—was chosen by the Regents. In the spring of 1929, UCLA was moved to its permanent home.

In the 1930's UCLA expanded its educational facilities to include a College of Agriculture (no longer operational), a College of Business Administration (which, renamed in 1950, operated as the School of Business Administration until 1966), a College of Applied Arts (later replaced by a College of Fine Arts), a School of Education (later renamed the Graduate School of Education), and a Graduate Division. Graduate work was authorized in 1933 and the first Ph.D. awarded in 1938. Since 1940 the schools of Architecture and Urban Planning, Dentistry, Engineering and Applied Science, Law, Library Service, Medicine, Nursing, Public Health, Social Welfare, and a Graduate School of Business Administration have been added.

Recognizing the value of an interdisciplinary approach to the search for knowledge, the University of California organized research units outside the usual departmental structure. Today, along with libraries, UCLA's research facilities include institutes, centers, projects, bureaus, nondepartmental laboratories, stations, and museums.

### **Survey of Curricula**

The scope of the undergraduate and graduate programs of instruction offered in the colleges and schools of the University on the Los Angeles campus is briefly indicated below. For more details see pages 66 through 145 of this bulletin.

The College of Letters and Science offers curricula leading to the degrees of Bachelor of Arts and Bachelor of Science, and the following preprofessional curricula: precriminology, pre dental, pre dental hygiene, preengineering, premedical, prenursing, preoptometry, prepharmacy, and prephysical therapy.

The College of Fine Arts offers curricula leading to the degree of Bachelor of Arts.

The School of Engineering and Applied Science, and School of Nursing, offer curricula leading to the degree of Bachelor of Science.

The School of Dentistry offers a curriculum leading to the degree of Doctor of Dental Surgery.

The School of Law offers a curriculum leading to the degree of Juris Doctor and Master of Comparative Law.

The School of Medicine offers a curriculum leading to the degree of Doctor of Medicine.

The Graduate School of Education supervises curricula leading to the Certificate of Completion of the various elementary and secondary credentials, and for the administrative credential.

The Graduate Division, in cooperation with the colleges and schools of the University, supervises advanced study leading to the academic degrees of Master of Arts, Master of Arts in Teaching, Master of Science, Candidate in Philosophy, and Doctor of Philosophy; and the professional degrees of Master of Architecture, Master of Business Administration, Master of Education, Master

of Engineering, Master of Fine Arts, Master of Journalism, Master of Library Science, Master of Nursing, Master of Public Administration, Master of Public Health, Master of Social Psychiatry, Master of Social Welfare, Doctor of Education, Doctor of Public Health and Doctor of Social Welfare.

## Study and Research Facilities

### THE UNIVERSITY LIBRARY

The University Library on the Los Angeles campus consists of the University Research Library, the College Library, and a number of specialized libraries. Its collections contain nearly three million volumes, and extensive holdings of government publications, pamphlets, manuscripts, maps, microtext editions, music scores, recordings, and slides. The Library regularly receives about 45,000 serial publications.

The principal collections in the social sciences and the humanities are in the University Research Library. The card catalog here lists all cataloged books in the Research Library, the College Library, and other campus libraries and in the William Andrews Clark Memorial Library.

The University Research Library provides special study and research facilities for graduate students, including facilities for reading microtext materials and for the use of typewriters. Students enrolled in graduate courses have access to the main book stacks in the Library.

An open-shelf collection of books of interest primarily to undergraduate students is maintained in the College Library, in the Powell Library Building.

Late in the fall of 1970, certain major collections and services of the University Library which at time of publication of this announcement are situated in the Powell Library Building will be moved to the second unit of the University Research Library, now under construction. These are the Department of Special Collections, the Public Affairs Service, and the Oriental Library.

The Department of Special Collections, in the Powell Library Building, contains rare books and pamphlets, manuscripts, the University Archives, certain subject collections of books, early maps, and files of early California newspapers.

Collections of rare materials may also be found in special units of the Art Library, the Biomedical Library, and the Business Administration Library.

The Public Affairs Service provides a coordinated service embracing collections of official publications of governments and international organizations and of other books and pamphlets in the social sciences. In the fall of 1970 it will combine in its new quarters in the Research Library the Government Publications Service, the Government and Public Affairs Reading Room, and the Social Sciences Materials Service. It is a depository for the official publications of the United States government, the State of California, California counties and cities, the United Nations and some of its specialized agencies, and a number of other international organizations. Also available are selected publications of the other states and possessions of the United States, publications of foreign governments, books and pamphlets on local government, and reference and pamphlet materials on industrial relations and social welfare. The John Randolph Haynes and Dora Haynes Foundation Library is administered by the Public Affairs Service.

The Biomedical Library, in the Center for Health Sciences, has collections in all of the health and life sciences. Materials for engineering, astronomy, meteorology, and mathematics are kept in the Engineering and Mathematical Sciences Library. Education, physical education, and psychology are the principal subjects served by the Education and Psychology Library. Other libraries serve the fields of Architecture and Urban Planning, Art, Business Administration, Chemistry, English, Geology-Geophysics, Law, Maps, Music, Oriental Languages, Physics, Theater Arts, and the University Elementary School.

The resources of these libraries are available to all students and members of the faculty of the University.

The Photographic Department, in the Powell Library Building, offers complete documentary photographic service, where photostats, microfilms, slides, ozalid prints, and other photographic work are done. A service for the rapid photocopying of periodical articles and portions of books is available in the University Research Library, the College Library, the Biomedical Library, the Engineering and Mathematical Sciences Library, the Chemistry Library, and the Law Library. Self-service copiers are available for use in several Library units.

A Library handbook, describing the organization and services of the University libraries and listing their schedules of hours, may be obtained in any of the campus libraries.

Supplementing the University Library is the William Andrews Clark Memorial Library of about 75,000 books, pamphlets, and manuscripts, featuring English culture of the seventeenth, eighteenth, and nineteenth centuries, and the history of Montana. Materials in the library do not circulate. The Clark Library sponsors an annual program of summer postdoctoral fellowships. The areas of study are based on the particular strengths of the Library's holdings. Each year a Clark Library Fellowship is granted to a UCLA graduate student working toward a doctorate within one of the Library's fields of interest and each year also an eminent scholar is brought to the Library as its Senior Research Fellow. This library is not on the University campus, but is situated at 2520 Cimarron Street, at West Adams Boulevard.

Bus service is provided Monday through Friday, upon request, from the UCLA campus to the Clark Library. Reservations for bus service must be made with the Administrative Office before noon of the preceding day, and before noon on Friday for Monday transportation to Clark Library. The Library is open Monday through Saturday from 8 a.m. to 5 p.m. Leaflets describing the Clark Library are available upon application to the University Librarian.

### **SPECIAL RESEARCH FACILITIES**

Recognizing the value of an interdisciplinary approach to the search for knowledge, the University maintains organized research units outside the usual departmental structure. Organized research units aid research and may enhance the teaching of participating members of the faculty, but they do not offer regular academic curricula or confer degrees. They may provide research training to graduate students employed in research programs with faculty supervision. Organized research units are designated as institutes, centers, projects, bureaus, nondepartmental laboratories, stations and museums. While the ob-

jectives and fields of study vary widely, an institute is organized around a broad subject area which cuts across department, school, college or even campus boundaries. A center may be an agency established within an institute covering a major area, or it may be separate and provide specialized facilities. A bureau is an academic agency engaged primarily in public service activities and in facilitating research in one or more academic departments related to these activities. The more specialized activities in focal fields are described as programs, laboratories, and projects.

### **Institutes**

The **Institute of Geophysics and Planetary Physics** was established to encourage research in geophysics and space physics and to provide advanced training for qualified personnel. Members of the Institute staff on several campuses and members of associated departments are prepared to supervise graduate work in a variety of fields.

Graduate students interested in atmospheric research and enrolled in the astronomy, chemistry, geochemistry, geology, meteorology, physics, or planetary and space physics M.A., M.S., and Ph.D. programs may engage in research and advanced studies on the characteristics of the interplanetary medium, the structure of the moon and the planets, radiation belt physics, atmospheric structure and dynamics, geomagnetism and solar physics, and many other areas.

The **Space Science Center**, a part of the Institute, was established to develop facilities for space-related research by faculty and graduate students, to promote interdepartmental programs of education and research in the space sciences, and to administer funds for space-related research in the physical and biological sciences and engineering.

**W. F. Libby, Director**

The **Institute of Transportation and Traffic Engineering** is engaged in a broad range of research related to transportation, ordinarily in areas that cross departmental lines. These areas include: human factors in transportation; accident and injury prevention; safety glass research; driving simulation; advancement of human simulation, for trauma research and research in other fields, by evolving improved anthropometric dummies; accident data analysis; psychological and physiological factors in traffic safety; transportation theory, systems analysis, and operations research; transportation economics and administration and systems planning, including related land use. Current research efforts also include development of improved probabilistic and deterministic models of traffic behavior, as well as aerial photography studies into the detailed aspects of multilane freeway traffic flow.

The Institute trains specialists in accident research methodology and in driving simulation, and offers financial support and guidance for graduate students in these areas.

**Harry W. Case, Associate Director**

The **Brain Research Institute** provides an environment for research in the neurological and behavioral sciences for investigators particularly from the behavioral, health and life sciences fields but also from the physical sciences and engineering. Three principal goals of the Institute are: (1) to undertake research which contributes to an understanding of brain mechanisms and be-

havior; (2) to contribute to the training of predoctoral and postdoctoral students for professional careers in brain science; (3) to develop and disseminate information about brain function in the interest of the social and scientific communities. Located in the Center for the Health Sciences, the Institute conducts programs which are largely interdisciplinary. General activities include attention to such broad fields of interest as neurophysiology, neurochemistry, neuroanatomy, neuropharmacology, neuroendocrinology, neuropsychiatry, biophysics and communications, neuroimmunology, behavior and neuropathology.

**J. D. French, Director**

The **Cancer Research Institute** is located in the School of Medicine to provide research facilities in this field for departments of the School. **J. J. Stein, Director**

The **Dental Research Institute**, located within the new facility of the School of Dentistry, has been established to provide multidisciplinary studies in basic, clinical, and public health sciences which offer promise of benefits in oral health.

**Gordon Nikiforuk, Director**

The **Jules Stein Eye Institute** is a comprehensive facility located within the Center for the Health Sciences, devoted to research in the sciences related to vision, the care of patients with eye disease and the dissemination of knowledge in the broad field of ophthalmology. Incorporated in this structure are outpatient, inpatient and operating room facilities for the care of patients with ophthalmic disorders; areas for research in the sciences related to vision; and facilities for scientific reading, lectures and seminars. The Institute affords a unique opportunity for the training of students in the School of Medicine, residents and graduate physicians. A close relationship with graduate and undergraduate research and teaching facilities at UCLA is maintained.

**B. R. Straatsma, Director**

The **Molecular Biology Institute** was established to serve interested departments of the biological, medical, and physical sciences in the coordination, support and enhancement of research and training in molecular biology. Interests and activities of the Institute encompass all approaches which aim to explain biology at a molecular level, with particular emphasis on correlation of structure and function. These include study of molecular genetics; protein and nucleic acid synthesis, properties, and function; biological ultrastructure; metabolic control; contractility; and other phenomena. Staff members from departments in biological, physical, and medical sciences participate in Institute programs, and the Institute aids departments in graduate training and postdoctoral programs in the general area of molecular biology. **P. D. Boyer, Director**

The **Neuropsychiatric Institute** is a research and teaching unit in the Center for the Health Sciences, supported by the State Department of Mental Hygiene. It houses the Department of Psychiatry, the divisions of Neurology, Neurosurgery, and Neuropathology, together with research laboratories, 180 inpatient beds, several outpatient clinics, and a community psychiatry program. The research and teaching program involves a multidisciplinary approach to the problems of functional and organic disorders of the nervous systems, including

mental retardation, and the full range of mental and emotional disorders of children and adults.

Louis Jolyon West, Medical Director

The Institute of Rehabilitation and Chronic Diseases, located on the West Medical Campus, was established to develop basic theory and clinical techniques relevant to chronic disabling disease. Investigative areas include arthritis, audiology, bone and hard tissue metabolism, cardiology, cerebral palsy, endocrinology, kidney function and disease, neurology, physical therapy, prosthetics, and pulmonary function. Fellowships are available through the participating divisions. Much of the work involves participation by basic as well as medical scientists.

R. Goldman, Acting Director

The Institute of Industrial Relations, authorized by the Legislature of the State of California in 1945, is concerned with two principal types of activity. The first is an interdisciplinary research and publishing program directed primarily toward the study of labor-management relations, wages and related problems, economic security programs, the labor market, the impact of technological change, the problems of poverty and minority groups, human relations, labor law, labor history and comparative studies. Research staff members of the Institute are usually drawn from the regular faculties of the Graduate School of Business Administration, the Departments of Economics, Political Science and Sociology, and the School of Law. This program affords opportunities to graduate students specializing in personnel management and industrial relations to engage in investigative work under expert guidance. The second main activity consists of community and labor relations programs serving management, unions, the public, and other groups interested in industrial relations activities. The programs consist of public lectures, conferences, symposia and institutes of varying duration, and include a series of courses through University Extension leading to a Certificate in Industrial Relations.

B. Aaron, Director

The Western Management Science Institute fosters research and advanced education in the management sciences and operations research. It conducts mathematical and computer-oriented studies on a variety of subjects. These include the construction of optimization models for production and inventory systems, finance and marketing policies, conservation of natural resources, and resource allocation in organizations. Appropriate tools of mathematical and combinatorial programming and of simulation are being developed and applied. The basic economics of decision and information systems is also being studied.

In addition to its research programs, the Institute is engaged in developing faculty resources and graduate curricula in the management sciences, and sponsors workshops and seminars including the Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences.

Although composed largely of faculty members of the Department of Business Administration, the Institute staff is interdisciplinary. Overall policy guidance is provided by an Advisory Committee representing the departments of Business Administration, Economics, Engineering, Law, Mathematics, Political Science, Psychology, and Sociology.

Director to be Appointed

The Institute of Library Research was established in September 1963 as a result of the University's recognition of the need for organized research for

the satisfactory solution of library and information systems problems. The Institute is a Universitywide agency with offices and research activities on the Los Angeles and Berkeley campuses. The office of the Director is at UCLA; the office of the Associate Director is at UCB. Areas of concern to the research program of the Institute are: integration into the library of new methods for recording and disseminating knowledge; mechanization of processes in libraries and information centers; improvement of control over the increasing volume and variety of information produced; continuing examination of the role and functions of the research library; integration of individual research libraries into larger systems; development of methodologies for the solution of specific information problems; and the education of appropriate research and professional personnel. The Institute invites the participation of students, faculty members, and research personnel of all departments of the University, since information and the university library system are of almost universal interest.

**Robert M. Hayes, Director**

The main objectives of the Institute of Government and Public Affairs are to add to the understanding of major public issues and to develop intellectual talent equipped to meet the challenges of a highly scientific urban society. The Institute is an interdisciplinary research unit involving the cooperative efforts of such disciplines as sociology, economics, law, medicine, political science, engineering, social welfare, and psychology. Current and recent studies include: the National Legal Program on Health Problems of the Poor, Health Jurisdictions, Los Angeles Riot Study, Design of a Regional Information System, Survey of Hallucinogenic Drug Use, Decision Making in Los Angeles, Impact of Federal Programs on Intergovernmental Reorganization, Program Budgeting for State and Local Governments, Educational Innovations, State and Federal Fiscal Policy, and Municipal Boundary Standards. The Institute also administers the Compton-UCLA Urban Research and Development Program; this is primarily an urban action rather than a study program and involves services by UCLA to a predominantly black community.

The Institute provides fellowship and traineeship support to a limited number of graduate and postdoctoral students who participate in Institute research projects as fellows or research assistants.

**W. Z. Hirsch, Director**

The Institute of Ethnomusicology was established to encourage interdisciplinary collaboration among musicologists and other specialists and to facilitate an interdisciplinary approach to major research problems. The overall research objectives are concerned with techniques for defining and describing, on an international and comparative basis, the norms of style relative both to music itself and to music within its social context. Studies are directed toward fundamental concepts as well as toward new laboratory methods and techniques. Specific projects, in which there is balanced emphasis on performance, theory, and research, include the following major geographic areas: the Americas, including Alaska; Oceania; the Far East; South and Southeast Asia; the Balkans and the Near East; Africa; and Western Europe. A large archive of unique materials and complete laboratory facilities are available to graduate students and faculty. Special symposia, lectures, and presentations of non-Western music



and dance are offered as a public service. A limited number of scholarships, teaching assistantships, and research assistantships are available.

**M. Hood, Director**

### **Centers**

The **Water Resources Center** is a Universitywide organization charged with coordinating water resources research on the several campuses. Through University research funds and funds from the Office of Water Resources Research, U.S. Department of the Interior, it supports selected research proposals in such departments as Agricultural Sciences, Botanical Sciences, Engineering, History, Meteorology, and Political Science. Most of these projects provide research assistantships for the training of graduate students. No research is conducted in the Center itself.

Research interests include water resources systems engineering, desalting of water, political strategy in water resources development, soil mechanics problems in water resources development, the history of water resources development, improvement in methods of forecasting precipitation and runoff, and management of water quality. Graduate students may contact the Center, Room 2066, Engineering I, for information on current research projects, which may vary from year to year, and on the departments and faculty concerned.

**Arthur F. Pillsbury, Director**

The **Reed Neurological Research Center**, a research and teaching facility of the School of Medicine, is under construction with occupancy planned for Fall 1970. Its program will be broadly interdisciplinary, directed to solution of clinical and basic problems in neurology. While study will encompass a broad neurological field, emphasis will be on multiple sclerosis and the demyelinating process. Twelve research beds and a research outpatient clinic will facilitate the availability of clinical material.

**Augustus S. Rose, Director**

The **Survey Research Center** is an independent unit designed to serve in three capacities: (1) as a service bureau for carrying out surveys for research workers and others; (2) as a specially equipped laboratory where students and faculty can experiment with, or develop skills in, the technical aspects of surveys; and (3) as a research unit which undertakes studies involving use of large scale or complex surveys for their basic data. The service bureau provides such services as study design, sampling, questionnaire construction, interviewing, coding, and data processing. The laboratory is available to faculty for their research or as an adjunct to their courses. A research program involving a wide spectrum of content interests is under development. A limited number of traineeships and research assistantships are available.

**I. G. Reeder, Director**

The primary on-campus role of the **Afro-American Studies Center** is to fill a void in present-day curricula, literature, and academia in general created by the racial imbalance in our systems of higher education. Off-campus, its primary role is to assist black people in their quest for self-determination.

To fulfill this role the Center is empowered to develop resources for an interdepartmental major; to conduct research into the black condition both in order to improve that condition itself and to improve the relevant higher educational

processes related to that condition; to establish a library; to publish a journal from the black perspective; to encourage visiting black faculty to supplement the regular faculty in the teaching of black studies; to conduct a cultural events and public lectures program as a forum and outlet for contemporary black art, literature, and thought; to achieve greater black community participation in the University program; and to provide better machinery for interracial understanding.

**Director to be Appointed**

The Asian American Studies Center is a new kind of academic institution. Like other university research centers, the Asian American Studies Center concentrates on a particular area of studies. It will encourage new programs of study, promote systematic research, develop library materials in Asian American studies, and offer a number of assistantships to encourage promising graduate students to specialize in this area. In addition, the Center sponsors periodic lectures, symposia, and cultural events. But unlike most other research centers, the Asian American Studies Center has close ties with the surrounding Asian American communities in the Los Angeles area. The Center encourages action-oriented and other projects related to these communities. Faculty, students, staff, and community representatives work closely together in all aspects of the Center's activities.

**Philip Huang, Acting Director**

The principal objectives of the Mexican American Cultural Center are to encourage and support research into all areas of knowledge relevant to the Chicano community; to assist in the development of programs and research which will focus the unique resources of the University on the problems of the Chicano community; to assist in the development of new curriculum and bibliographical materials dealing with the culture, history, and problems of the Chicanos; and to actively engage in furthering the involvement of the University with the Chicano community.

To achieve these and related objectives, the Center will act as stimulus, support, and resource agency for existing University departments, schools, and institutes. Through its research activities it offers resources for graduate degree programs. The Center publishes the journal *Aztlan*, which focuses attention and disseminates information dealing with socioeconomic and political anomalies as they relate to the Chicano and the society, and anticipates developing its own library.

**Gilbert D. Garcia, Director**

The Center for African Studies provides a framework for furthering study and research on Africa involving social sciences, education, linguistics and the humanities. The Center participates in graduate and undergraduate degree programs of African studies taken in conjunction with degrees in social sciences or African languages. Through its Research Committee, the Center makes grants for research on Africa on all campuses of the University of California. Its Fellowship Committee each year awards full stipends or supplementary grants-in-aid to students concentrating upon Africa in graduate degree programs. The Center provides information to faculty and students on extramural sources of research support. Other Center activities include public education programs in Africa, training programs for specialist personnel such as Peace Corps Volun-

teers, the bringing of Africanist scholars and leading African personalities to the University as short-term lecturers or as research associates, the sponsorship of an interdisciplinary colloquium each quarter focused on an integrating theme, and a publications program.

**Leo Kuper, Director**

The Center for Latin American Studies serves individual and cooperative research of faculty and graduate students in the social sciences, education, humanities, art, law, engineering, and the health sciences. In addition to cooperating with seven colleges and professional schools of the University, the Center conducts systematic multidisciplinary research, implemented by the faculty and graduate students involved in the interdisciplinary seminar, on the UCLA campus as well as in the Center's regional research and training centers in Brazil, Venezuela, and Mexico. The Center facilitates the exchange of personnel between UCLA and Latin America, and awards stipends and grants-in-aid to students in the graduate degree program. Through the Deans' Advisory Committees for Latin American Studies which function in colleges and schools throughout the campus, the Center provides channels for academic intercommunication among the University's Latin Americanists. The Latin American Center publishes a series of documentary publications, e.g., STATISTICAL ABSTRACT OF LATIN AMERICA, LATIN AMERICAN STUDIES SERIES, REFERENCE SERIES, and REPRINT SERIES.

**J. Wilbert, Director**

The Center for Medieval and Renaissance Studies is concerned with understanding the nature, causes, and processes by which, between about A.D. 300 and 1600, European culture in all its aspects built up such a store of energy and competence that it overran the rest of the world. Since during that time the West was an "emerging" society, far less distinct from the Near East and more open to external influences than it has since become, the Center includes within its concept of the Middle Ages and Renaissance not only the Occident but also Byzantium, the Slavic world, Islam, the scattered Jewish communities, and the minor Eastern Christian groups. It fosters research on the interplay between these related societies as well as on problems internal to each.

The Center assists individual and group investigation by conferences, symposia, lectures, an annual journal, VIATOR, and its two published series, the CONTRIBUTIONS AND THE PUBLICATIONS. It annually awards several research assistantships to doctoral candidates; three of these are designated for Byzantine studies.

**Lynn White, Jr., Director**

The Center for Near Eastern Studies was established to promote individual and collaborative research and training in this area. The Center encourages the research of individual faculty members and collaborates in the solution of basic research problems which require institutional backing. The Center also sponsors lectures, seminars and conferences on various topics falling within the scope of Near Eastern studies, and actively promotes an extensive publication program.

**G. E. von Grunebaum, Director**

The Center for Russian and East European Studies was established to promote, assist and coordinate research and training on the countries of Eastern Europe. It furthers the research of individual faculty members and graduate

students, sponsors colloquia, seminars and lectures, organizes conferences, and participates, with other universities, in academic exchange programs with the countries of Eastern Europe.

**Henrik Birnbaum, Director**

The Center for The Study of Comparative Folklore and Mythology is the research arm of the Folklore and Mythology Group, which was organized to stimulate interest in folklore along interdisciplinary lines. In addition to mythology, primitive myth and ritual are a concern of the Center. The Center attempts on the one hand to relate modern folklore to ancient mythology and on the other to show in terms of folklore and mythology the impact of higher cultures upon lower. In mythology particular emphasis is laid on the ancient Indo-European, Finno-Ugric and Semitic traditions of Europe, Western Asia, and the Near East. Collecting projects are under way in Latin America and the Philippines. Within the United States research projects involve the compilation of a dictionary of American popular beliefs and superstitions, with supporting work in American legendry, custom and usage. Also, the Center has embarked on a wide-ranging survey of Anglo-American balladry and folk song, from ancient times to the present. The collecting of ethnic folklore, as well as genres of Anglo-American material, is an important part of the program.

**W. D. Hand, Director**

### **Museums and Special Collections**

The UCLA Art Galleries were established with the support of Edward A. Dickson, for whom the Dickson Art Center was named. The permanent holdings originated with the Willitts J. Hole Collection of the Italian, Spanish, Dutch, and English schools. To this was added the James Kennedy Collection of English paintings of the 18th, 19th, and 20th centuries. In addition, many paintings, chiefly of the present century, have been donated.

The new Art Galleries include a print room and study room, the home of the Grunwald Graphic Arts Foundation, which includes primarily modern German, French, and Italian prints and drawings with excellent examples of earlier works: Durer, Mantegna, Rembrandt, Schongauer. Most of these are the gift of Fred Grunwald, with substantial augmentations from other collectors.

The large sculptures in the court of the Dickson Art Center and on the North Campus are in charge of the Art Galleries. They include works by Andrews, Archipenko, Arp, Calder, Casanova, Consagra, Etrog, Lachaise, Laurens, Lipchitz, Anna Mahler, Marcks, Matisse, Moore, Muller, Noguchi, Rosenthal, David Smith, Zajac, and Zorach. They are the gifts of the David E. Bright Estate, and of many friends of UCLA and members of the UCLA Art Council.

The Art Galleries present annually five major exhibitions related to the educational program of the Department of Art. One of these exhibitions is regularly sponsored by their supporting organization, the UCLA Art Council.

**F. S. Wight, Director**

The Museum and Laboratories of Ethnic Arts and Technology comprise a growing collection of objects which exemplify the range of the material culture, and specifically of the arts, of people who lived until recently at or beyond the margins of the major Oriental and Occidental civilizations. Collections represent the arts and archaeology of Africa, Melanesia, the Americas, the ancient Near

East, the circum-Mediterranean cultures, the European Neolithic and Bronze ages, and the folk arts of Latin America, Europe, and the Orient. The Museum and Laboratories promote the study of arts and artifacts as one of the most promising avenues toward an understanding of man. As a resource for UCLA faculty, students, visiting scholars of international repute, and the general public, they offer assistance with instruction, research, field work, exhibitions, and seminars, and sponsor exhibitions, lecture programs, symposia, and publications.

**Jay D. Frierman, Acting Curator**

The **Botanical Garden** provides an outstanding collection of specimen plants of the world. The experimental field, lathhouse and pollinating house are also in the Garden. Adjoining is the Plant Physiology Building, with glasshouses and controlled-growth rooms for instructional and research materials. The University maintains a teaching herbarium of specimens representative of the flora of the world. The collection includes the Bonati Herbarium, noteworthy for the specimens of old world Scrophulariaceae, an extensive and comprehensive collection of American Labiatae, and research collections of certain California genera. Special emphasis is placed on subtropical ornamental plants.

**Mildred E. Mathias, Director**

**Zoological collections** of the Department of Zoology include a research collection of marine fishes, primarily from the eastern Pacific and the Gulf of California, and the Dickey Collection of birds and mammals, primarily from the southwestern United States, western Mexico, and central and middle America. The department also maintains a more limited collection of fossil vertebrates. Through a cooperative arrangement, the large zoological collections of the Los Angeles County Museum, containing both fossil and recent specimens, are available for research by qualified students.

### **Laboratories**

The **Laboratory of Nuclear Medicine and Radiation Biology** conducts research in the fields of biophysics, nuclear medicine, biochemistry, developmental biology, radiation biology, and ecology. It is funded through a contract with the Atomic Energy Commission. Most of the program is conducted in Warren Hall, located on the West Medical Campus.

Warren Hall is well equipped with modern research tools including a cobalt radiation source with an activity of 10,000 curies at the time of installation. The laboratory staff consists of about 175 scientists, technicians and supporting personnel representing many disciplines: biophysicists, biochemists, physicians, physicists, physical chemists, electron-microscopists, biologists, soil scientists, plant physiologists, ecologists, and spectroscopists.

**O. R. Lunt, Director**

The **Cardiovascular Research Laboratory**, sponsored by the Los Angeles County Heart Association, does research and offers research training in the fundamental physiology of the heart. Among the main fields of study are the biophysical definition of the contractile state and the nature of excitation-contraction coupling in the heart, the ionic fluxes associated with this activity and the cellular compartments within which they are contained, and the biochemical, energetic and ultrastructural aspect of the contraction process.

**Wilfried F. H. M. Mommaerts, Director**

### Special Resources

The **Campus Computing Network** is the general computing facility on the UCLA campus. It maintains an IBM S/380 Model 91 with a 4-million byte high-speed core memory, the largest computer in any university. These facilities are made available to students, faculty, and research staff members at UCLA and more than 100 participating colleges and universities throughout the western United States. Hundreds of projects currently use the Network for research, education, and computer science development. Besides the standard batch processing of jobs, CCN offers a comprehensive system of computing services on its interactive remote console network, for which there are 38 TV-type terminals located on the campus. Programming documentation and consultation are available from CCN's staff members. William B. Kehl, Director

### Other Research Activities

Air Pollution Research Program  
 Archaeological Survey Program  
 Business Administration Research Division  
 California Institute for Cancer Research  
 Committee on International and  
 Comparative Studies

Exceptional Child Research Program  
 Housing, Real Estate, and  
 Urban Land Studies Program  
 Oral History Program  
 Security Studies Project  
 Zoology Fisheries Research Program

### Public Lectures, Concerts, Dance, Theater, Films and Art Exhibits

As opportunity offers, the University presents free public lectures of general and scholarly interest by qualified persons. These lectures are intended to supplement and stimulate the work of all departments of the University, and to offer students and community an opportunity to hear world-renowned authorities in every area of the arts and sciences.

The music program of the University includes many special events. The Concert Series Section of the Committee on Fine Arts Productions offers a broad variety of performances by soloists, chamber musicians, orchestral, choral, and other groups of nationally known artists.

During each quarter the Department of Music sponsors evening concerts by the A Cappella Choir, UCLA Men's Glee Club, Symphony Orchestra, UCLA Chamber Orchestra, Opera Workshop, Chamber Music Ensemble, Contemporary Music Ensemble, Collegium Musicum, Chorus, Symphonic Wind Ensemble, Madrigal Singers, Women's Choir, and the various ethnic study groups of the University. Individual artists, both students and faculty, present weekly Tuesday noon recitals that are free to the public.

Dance concerts are presented regularly under the auspices of the Dance Department. Well-known dance artists and companies are brought from all parts of the world by the Concert Series Section of the Committee on Fine Arts Productions. Performances range from ballet and folk to ethnic and modern. Students of dance present their original works in evening concert. Members of the dance faculty also perform their own choreography.

The UCLA Galleries, in the Dickson Art Center, contain a permanent collection of older masters, and present a series of significant temporary exhibitions many of which are circulated nationally. All aspects of art are covered in this program—painting, drawing, print making, sculpture, architecture, ceramics,

and industrial, environmental, and graphic design. The Grunwald Graphic Arts Foundation maintains a print study room and gallery in the Dickson Art Center and mounts a series of exhibitions related to the Art Department's program of advanced studies in the graphic arts. The Galleries are open from 11 a.m. to 5 p.m., Monday through Friday, and 1 to 5 p.m., Saturday and Sunday.

Rotating exhibitions of primitive and folk art from the collections of the Museum and Laboratories of Ethnic Arts and Technology are mounted in the Ethnic Art Gallery, Architecture Building. During exhibitions, the gallery is open noon to 5 p.m., Tuesday through Saturday, and 1 to 5 p.m. on Sunday.

In addition to its intramural, experimental production program, the Department of Theater Arts produces a varied selection of significant new and old plays from Aristophanes to Bernard Shaw, Shakespeare to Eugene O'Neill, as well as plays never produced before. These are presented in an annual season of six or more plays for the campus and community.

A number of art, documentary, educational, and foreign films, including film series, are presented each quarter. Twice a year in December and May, the Motion Picture Division of the Theater Arts Department presents several evenings of films written, directed and produced by students. All the events listed are open to the public.

### **Education Abroad Program**

The Education Abroad Program offers opportunities to undergraduate students of the University of California to study in universities overseas. It is administered for the entire University by the Santa Barbara campus.

In 1970-71 the University will continue the operation of its study centers in France, Germany, Hong Kong, Italy, Japan, Spain, Sweden, Norway, the United Kingdom, Ireland, Israel, Lebanon, Ghana, Kenya, Paris and Mexico. The Study Centers' primary purpose is to provide a sound academic experience in a different educational system. They also enable the University of California students to become deeply involved in the language and culture of the host country.

Eligibility requirements are: upper division standing in the University at the time of participation, two years of university-level work in the language of the country with a B average (or equivalent thereof), an overall B average, seriousness of purpose, and an indication of ability to adapt to a new environment. Transfer students are eligible if they meet the language requirement and have completed at least one language course in the University of California. (The language requirement is not applicable to the centers in Hong Kong, Ireland, Israel, Lebanon, the United Kingdom, Ghana and Kenya.) Special arrangements can be made for the participation of graduate students.

The participants will spend from nine to eleven months abroad, including a special orientation program, six or seven weeks of intensive language preparation (in all centers except those in Japan, Lebanon, the United Kingdom, Ghana and Kenya), a full academic year in the university of their choice, and some vacation travel.

The program in Mexico City and Paris is for two quarters only.

Each student will be concurrently enrolled on his home campus and in the host university and will receive full academic credit for courses satisfactorily completed.

The Regents endeavor to bring this year abroad within the reach of all students, regardless of their financial resources.

Applications for 1971-1972 will be accepted from September 1, 1970, through January 10, 1971. (Applications for Ireland and the United Kingdom must be filed no later than November 15, 1970.)

Note: For further information visit the Education Abroad Program, 2221B Bunche Hall, UCLA; or write to the Education Abroad Program, 1205 S. Hall, University of California, Santa Barbara 93018.

### **Summer Sessions**

In 1970 the University will conduct a self-sustaining summer quarter consisting of two summer sessions. The first session will begin on June 22; the second session will begin on August 3. For further information write to the Office of the Summer Sessions, Murphy Hall, University of California, Los Angeles, California 90024.

Admission to a Summer Session does not constitute admission to a regular session. Students planning to attend the University in regular session are referred to pages 23-31 of this bulletin.

### **Foreign Language Training**

Research and field work overseas may be facilitated by oral proficiency training in any of twenty-eight languages taught at the Defense Language Institute at the Presidio of Monterey. This unique program is available on a limited basis to University graduate students and faculty. For additional information, consult the Language Examination Coordinator, Student and Academic Affairs Section, Graduate Division. Application forms may be obtained from the Secretary, University of California Language Training Advisory Committee, University of California, Santa Cruz, California 95060.

### **University Extension**

It is the mission of University Extension to provide the intellectual bridge between the University and the people of the State of California, individually and in organizations. University Extension programs are designed to provide educational opportunity to adults for professional upgrading, personal growth through cultural programs, and more effective participation in civic affairs. In the broader social view, it is the assigned task of University Extension to provide the mechanism by which the resources of the University can be applied to the more rapid solution of statewide and urban problems.

A variety of methods are used to implement these aims: classes, discussion groups, correspondence courses, conferences, institutes, short courses, lectures, motion picture production, radio broadcasts, educational television, and counseling and testing.

Veterans may use the educational benefits available to them under Federal and State laws to enroll in University Extension classes, provided the classes are part of their prescribed and recognized objectives approved by the Veterans Administration.

For detailed information, write or telephone the University Extension office on any campus of the University.



# Admission to the University

## IN UNDERGRADUATE STATUS

The admission requirements of the University of California are based on two principles: first, that the best assurance of success in the University is shown by high quality of scholarship in previous work, and second, that the study of certain specified subjects will give the student both good preparation for the work of the University and reasonable freedom in choosing his field of specialization.

However, fulfilling the requirements stated below may not insure admission to the campus of first choice. On some campuses limits have had to be set for the enrollment of new students, and not everyone who meets the requirements can be admitted.

### Application for Admission

An application form may be obtained at the Office of Admissions, 1147 Murphy Hall, University of California, Los Angeles 90024.

The opening dates for filing applications for the year 1970-1971 are as follows: Fall Quarter, 1970, October 1, 1969; Winter Quarter, 1971, May 1, 1970; Spring Quarter, 1971, August 1, 1970.

A fee of \$10 must accompany each application.

Each applicant is responsible for requesting the graduating high school, and each college attended if he applies in advanced standing, to send official *transcripts* of his record directly to the Office of Admissions.

Those who are admitted will be required to return a *statement of intention to register*, together with a nonrefundable fee of \$50, which will be credited to the incidental fee if the student registers in the quarter for which he applied.

### Subject A: English Composition

Every undergraduate entrant must demonstrate an acceptable ability in English composition. There are several ways in which this requirement may be met before the first quarter in residence (see page 40). But students who have not already fulfilled the requirement must, during their first quarter, enroll in the course in Subject A, a noncredit course for which a fee is charged.

### Requirements for Admission to Freshman Standing

An applicant for admission to freshman standing is one who has not registered in any college-level institution since graduation from high school.

The requirements listed below apply to California residents; for special requirements for nonresident applicants, see page 27.

### Graduation from High School

#### Subject Requirements

Courses offered in satisfaction of the following subject requirements must be included on a list submitted to the Director of Admissions of the University by the high school principal if the school is located in California. This list must

have been certified by the principal to the effect that the courses meet the requirements for admission to the University, and the list must have been approved by the Director of Admissions. If the high school is not located in California but is regionally accredited, appropriate courses will be considered acceptable.

**A. HISTORY—1 YEAR**

This must consist of a year course in United States history, or one-half year of United States history and one-half year of civics or American government.

**B. ENGLISH—3 YEARS**

These must be university preparatory courses in English composition and literature.

**C. MATHEMATICS—2 YEARS**

These must consist of university preparatory courses in such subjects as algebra, geometry, trigonometry, calculus, elementary functions, matrix algebra, probability, statistics, or courses combining these topics.

**D. LABORATORY SCIENCE—1 YEAR**

This must be a year course in one laboratory science.

**E. FOREIGN LANGUAGE—2 YEARS**

These must be in one language. Any foreign language with a literature is acceptable.

**F. ADVANCED COURSE—1 OR 2 YEARS**

This must be chosen from one of the following:

*Mathematics.* A total of 1 year of mathematics beyond the 2 years offered toward the mathematics requirement.

*Foreign language.* Either an additional year in the same language offered toward the foreign language requirement or 2 units of another foreign language.

*Science.* A year course in laboratory science completed after the science offered toward the science requirement.

Electives to complete the minimum of 15 standard entrance units are also required.

The subject requirements listed above may be satisfied only by courses completed with a grade of C or higher.

### **Scholarship Requirements**

At least a B average is required in courses taken after the ninth year which are used to meet the subject requirements listed above.

In determining the required average, a grade of A in one course will be used to balance a C in another; but an A grade may not be used to compensate for any grade below C. Grades, including those earned in accelerated and advanced courses, are accepted as they appear on the high school transcript.

Courses taken in the ninth year or earlier in which a grade below C is received may be repeated to establish subject credit.

Courses taken after the ninth year in which a grade of D or F is received may be repeated to establish subject credit and to improve scholarship. Courses

may be repeated in an amount not to exceed a total of two semesters of the required subjects. Grades earned in such repetitions will not be counted higher than a C in determining the scholarship average.

### Examination Requirement

As a requirement for admission, all freshman applicants must submit scores from the following examinations of the College Entrance Examination Board:

1. The Scholastic Aptitude Test
2. Three Achievement Tests, which must include:
  - a. English composition
  - b. social studies *or* foreign language
  - c. mathematics *or* science

Applicants whose scholarship average in the required high school subjects is 3.00 to 3.09 inclusive must achieve a total score of 2500 or higher on the examinations. The test results of all applicants will be used for purposes of counseling, placement, and, when possible, satisfaction of the Subject A requirement.

The tests should be taken *after* completion of the first half of the eleventh grade. The verbal and mathematics scores on the Scholastic Aptitude Test must be from the same sitting.

For arrangements to take the tests, see below.

### ADMISSION BY EXAMINATION ALONE

An applicant who does not meet the scholarship and subject requirements for admission and who has not registered in any college-level institution (except for a summer session immediately following high school graduation) may qualify for admission by examination alone. For admission of nonresident applicants by this method, see page 27.

To qualify, the applicant must achieve high scores in the examinations required of all eligible applicants. The total score on the Scholastic Aptitude Test must be at least 1100; the scores on the three Achievement Tests must total at least 1650, and the score on each must be at least 500.

To obtain information about the tests or to make arrangements for taking them, apply to Educational Testing Service, P. O. Box 1025, Berkeley, California 94701, or P. O. Box 592, Princeton, New Jersey 08540. Scores will be regarded as official only if they are received by the Admissions Office directly from Educational Testing Service.

### Admission to Advanced Standing

An applicant who has registered in a junior college, a four-year college, a university, extension classes of college level, or any comparable institution since graduation from high school is subject to regulations governing admission to advanced standing. He may not disregard his college record and apply for admission to freshman standing.

Applicants for admission to advanced standing must meet the requirements listed below. These requirements apply to California residents; for special requirements for nonresident applicants, see page 27.

### **HIGH SCHOOL SUBJECT REQUIREMENTS**

Students are expected to have satisfied, either through high school or college courses, the subjects required for admission of high school graduates to freshman standing (see page 24). Courses taken in an approved college, of appropriate content and completed with satisfactory grades, may be used to clear high school subject deficiencies.

Deficiencies in subject requirements will be waived in an amount not exceeding four semester courses if the applicant presents a college record of at least 84 quarter units or 56 semester units acceptable for advanced standing credit, with a grade-point average of 2.4 or higher in all such units attempted.

### **MINIMUM SCHOLARSHIP REQUIREMENTS**

In college courses acceptable for transfer to the University, certain grade-point averages are required. Grade points are assigned as follows: for each unit of A, 4 points; B, 3 points; C, 2 points; D, 1 point; incomplete and failure, no points. The grade-point average is determined by dividing the total number of acceptable units attempted into the number of grade points earned on those units.

The minimum grade-point average required for transfer from another institution depends on whether or not the applicant was eligible to enter the University at the time of graduation from high school. If he was eligible to enter in freshman standing, the required overall average in courses acceptable for advanced standing credit is C (2.0) or higher. But if the applicant was ineligible at the time of high school graduation because of low scholarship or a combination of low scholarship and incomplete subject preparation, then he must have altogether at least 84 quarter units or 56 semester units with a grade-point average of 2.4 or higher.

In addition, every applicant must present from the last accredited college or university attended a statement of good standing and an academic record with an average of at least 2.0. If the record at any institution previously attended shows an average below 2.0, further requirements may be imposed to insure that the subsequent program offsets the deficit.

### **Credit for Work Taken in Other Colleges**

#### **And by Examination**

The University grants unit credit for courses appropriate to its curriculum which have been completed in other regionally accredited colleges and universities. This credit is subject to the restrictions of the senior residence requirement of the University.

As an integral part of the system of public education in California, the University accepts, usually at full unit value, approved transfer courses completed

with satisfactory grades in the public junior colleges of the State. Such transfer courses are limited to a maximum of 70 semester units or 105 quarter units.

Extension courses taken at an institution other than the University may not be acceptable. The decision regarding their acceptability rests with the Office of Admissions.

Also credit is allowed for having completed with high scores certain tests of the College Board. These include Advance Placement Examinations and tests in the College Level Examination Programs.

### **Special Requirements for Nonresident Applicants**

The regulations below are designed to admit out-of-state applicants whose standing, as measured by scholastic records, is in the upper half of those who would be eligible under the rules for California residents.

#### **ADMISSION TO FRESHMAN STANDING**

##### **Graduation from High School**

The acceptability of records from high schools outside California will be determined by the Office of Admissions.

##### **Subject Requirements**

The same subject pattern as for California residents is required (see page 24).

##### **Scholarship Requirements**

The applicant must have maintained a grade-point average of 3.4 or higher on the required high school subjects (grade points are assigned as follows: for each unit of A, 4 points; B, 3 points; C, 2 points; D, 1 point; incomplete and failure, no points).

##### **Examination Requirement**

A nonresident applicant must take the same College Entrance Examination Board tests as those required of a resident applicant (see page 25).

#### **ADMISSION BY EXAMINATION ALONE**

A nonresident applicant who is not thus eligible for admission and who has not registered in any college-level institution (except for a summer session immediately following high school graduation) may qualify for admission by examination alone. The requirements for a nonresident applicant are the same as those for a resident except that the scores on the three Achievement Tests must total at least 1725 (see page 25).

#### **ADMISSION TO ADVANCED STANDING**

In addition to the regular admission requirements (see page 25), a nonresident applicant for admission to advanced standing must have earned a grade-point average of 2.8 or higher in college subjects attempted and acceptable for transfer credit.

If the applicant did not have at the time of high school graduation an average

of 3.4 or higher in courses satisfying the required subject pattern, he must present a minimum of 84 acceptable quarter units or 56 acceptable semester units with a grade-point average of 2.8 or higher.

### **Applicants From Other Countries**

The credentials of an applicant for admission from another country are evaluated in accordance with the general regulations governing admission. An application, official certificates, and detailed transcripts of record should be submitted to the Office of Admissions early in the appropriate filing period (see page 23). Doing so will allow time for exchange of necessary correspondence and, if the applicant is admitted, will help him in obtaining the necessary passport visa.

### **Compulsory Health Insurance**

The acquiring of health insurance is a condition of registering at the University for all foreign students except those in the United States on permanent immigration visas.

### **Proficiency in English**

An applicant from another country whose native language is not English may be admitted only after demonstrating that his command of English is sufficient to permit him to profit by instruction in the University. His knowledge of English will be tested by an examination upon his arrival at the University. Admission of an applicant who fails to pass this examination will be deferred until he has acquired the necessary proficiency in the use of English. An applicant from a non-English speaking country may wish to take the Test of English as a Foreign Language. Arrangements to take the test may be made by writing directly to TOEFL, Educational Testing Service, P. O. Box 592, Princeton, New Jersey 08540, U.S.A. Results of the test should be forwarded to the University.

### **Language Credit**

A student from a country where the language is not English, will be given college credit in his own language and its literature only for courses satisfactorily completed. Such credit will be allowed only for courses taken in his country at institutions of college level, or for upper division or graduate courses taken in this University or in another English-speaking institution of approved standing.

### **Engineering**

A beginning or intermediate student seeking a bachelor's degree in engineering who is outside the United States must pass, with satisfactory scores, the College Entrance Examination Board Scholastic Aptitude Test (verbal and mathematics sections) and achievement examinations in English composition, physics, and advanced mathematics, before a letter of admission to pre-engineering can be issued. Arrangements to take the tests in another country should be made directly with the Educational Testing Service, P.O. Box 592, Princeton, New Jersey 08540, U.S.A. The applicant should request that his scores for the tests be forwarded to the University.

Each advanced undergraduate student applying for admission to the School of Engineering and Applied Science who is outside the United States, must pass

a special qualifying examination. Arrangements to take this test may be made by writing directly to the Universitywide Director of Admissions, Room 570 University Hall, Berkeley, California 94720, U.S.A.

## IN GRADUATE STATUS

Requirements for admission to the Graduate Division include a bachelor's degree, or the equivalent, from an institution of recognized standing. The applicant's academic preparation should be equivalent to that required for a comparable degree at the University of California. A minimum average of B, or its equivalent, is required for the last two years of undergraduate study and for any postbaccalaureate study. Honors, awards, and experience related to the proposed field of study are important credentials. Individual departments may specify additional requirements and standards for admission, however, including such special examinations as the Graduate Record Examination or the Miller Analogies Test.

### Application

The prospective student may obtain application forms in person or by mail from the Admissions Section, Graduate Division, Murphy Hall, University of California, Los Angeles, California 90024, or from the department in which he wishes to study. With the application form will be enclosed a list of admission requirements which individual departments specify in addition to general UCLA requirements. An application form for University fellowships or other financial assistance will also be sent on request.

The University of California has recently eliminated a regular Summer Quarter from its academic year and, in its place, has scheduled two six-week self-sustaining Summer Sessions. The University's academic year 1970-71 will comprise the Fall, Winter, and Spring Quarters. Application for admission to graduate status is limited to these regular academic quarters. Enrollment in courses in the Summer Sessions does not constitute admission to graduate status (see Enrollment in Summer Session Courses, page 31).

Applications and supporting papers should be submitted to the Admissions Section of the Graduate Division, on or before the following dates:

May 15th for the Fall Quarter

October 15th for the Winter Quarter

January 15th for the Spring Quarter

Earlier application deadlines are required for certain departments, and these are stated in the instructions for application.

The following materials should accompany the application:

1. Application fee of \$10 (nonrefundable), by check or money order payable to The Regents of the University of California. A foreign student applying from abroad or an American student temporarily living abroad may find that his location or the difference in foreign exchange makes it impossible to send this fee with his application. In such a case, he is required to pay the fee on arrival at UCLA.

2. Official transcripts of record, *in duplicate*, from *each* junior college, college, or university at which the applicant has completed work. (Transcripts should accompany or immediately follow the application.) One set of transcripts will become a part of his permanent UCLA file, and the other set will go to his major department to help it evaluate his past record and to advise him about his future studies. If the student has graduated from UCLA or from another University of California campus and has there completed his last two years of study, he will need to submit transcripts for only that campus.

If a student is requesting a fellowship or other financial assistance, his application for admission, with transcripts and examination scores, will need to be submitted to the Admissions Section on or before the published deadlines for competition for these awards. For further information, consult the Fellowship and Assistantship Section of the Graduate Division.

### FOREIGN APPLICATIONS

The requirements and final application dates are the same for foreign applicants and U.S. applicants (see above). Because the evaluation of foreign credentials may take considerable time, however, applicants with credentials from institutions in other countries are advised to submit applications at least four to six months before the quarter in which they wish to register.

Foreign applicants should submit an official certificate or diploma showing completion of secondary school, as well as official transcripts of record, *in duplicate*, for all college and university work. College and university transcripts must show subjects studied, examination grades achieved, and award of degrees. If photocopies are submitted rather than original documents, they must bear the seal of the issuing institution and the actual (not photographed) signature of the college or university registrar.

Foreign applicants are advised not to come to UCLA until they receive formal notice of admission to the Graduate Division. They are notified by airmail as soon as a decision has been reached, and the I-20 form necessary to secure the student visa is enclosed with the notification of admission. Foreign applicants who have been accepted are encouraged to report to the Admissions Section, Graduate Division, as soon as possible after they arrive at UCLA in order to receive help in completing admission procedures.

### FOREIGN STUDENTS' ENGLISH EXAMINATION

Since English is the language of instruction at UCLA and success in graduate study depends largely on facility in its use, a foreign student whose first language is not English is required to take a proficiency examination before the term in which he is to register. His achievement in this examination determines whether he will be permitted to carry a full or a moderate graduate program or will be required to include English courses in his program. If he should be required to take English courses, he should anticipate spending a longer period of time at the University than he normally would require to complete a degree program.

Foreign students are encouraged to take the Test of English as a Foreign Language (TOEFL), if possible, in order to become aware of their level of



proficiency in English before undertaking the expense of traveling to the United States. The TOEFL, however, may not substitute for the required examination in English to be taken at UCLA on arrival.

The TOEFL is administered in more than ninety testing centers throughout the world by the Educational Testing Service, Princeton, New Jersey 08540, U.S.A.

### **APPLICATION REVIEW AND NOTICE OF ADMISSION**

The Graduate Division screens all applications to determine whether or not they meet University minimum requirements for graduate admission. If these requirements are met, the applications are submitted to the departments of the proposed majors for review and evaluation with respect to additional departmental requirements. Applicants are formally notified by the Graduate Division of their admission or rejection.

To applicants offered admission, the Graduate Division sends with the formal notification instructions on required registration procedures and the physical evaluation.

Applicants who are offered admission with work in progress are reminded that their admission is contingent upon receipt of evidence of its satisfactory completion.

### **Enrollment in Summer Session Courses**

Enrollment of prospective graduate students in Summer Session courses does not constitute admission to graduate status in the University, which is possible only through application for graduate admission during the regular academic year. Students who wish to apply Summer Session courses to their subsequent graduate programs should consult in advance with their departmental graduate advisers concerning this possibility. This is true also for students readmitted to graduate status who wish to resume their study in the Summer Sessions (see Readmission, page 33).

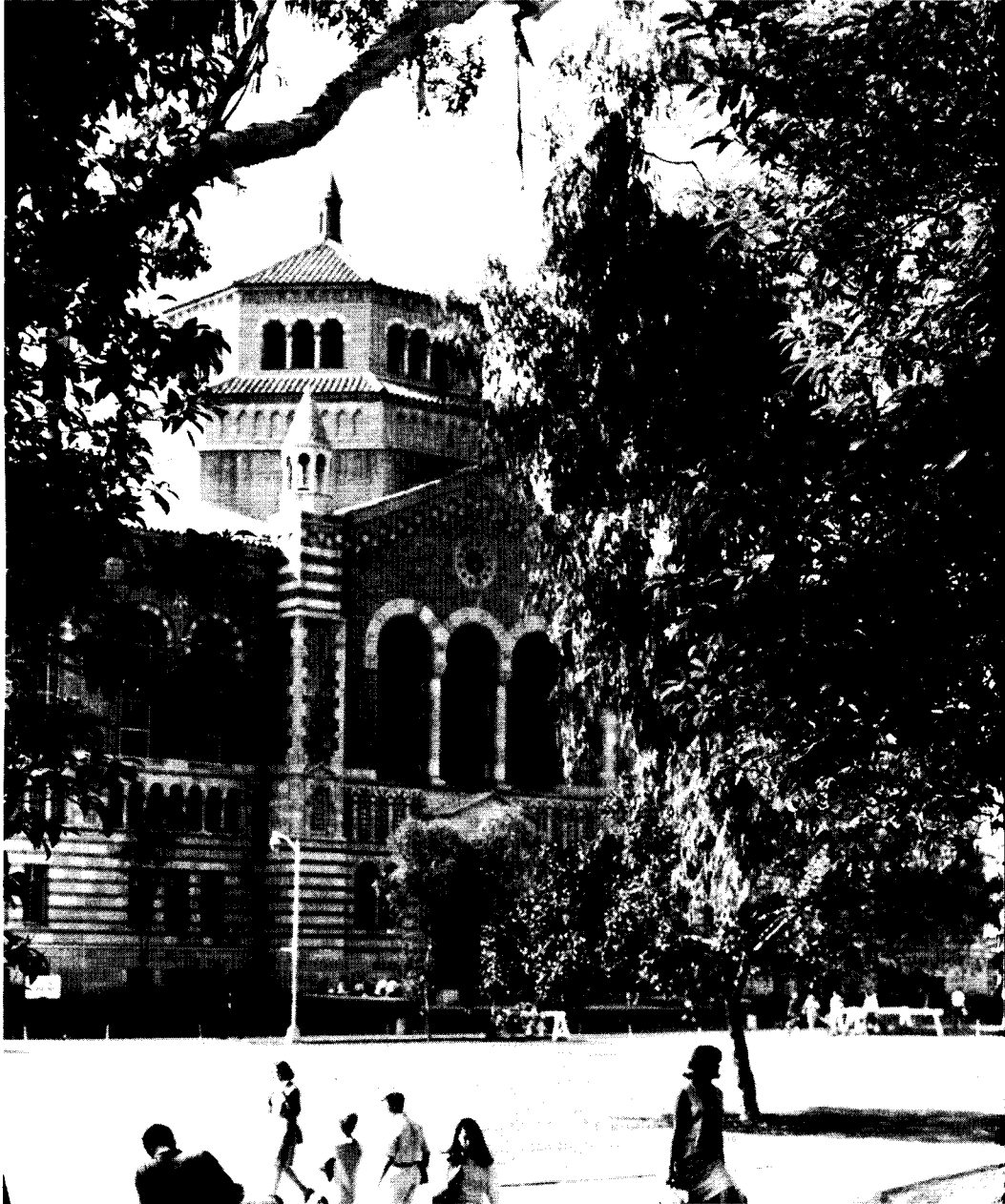
Information and applications may be obtained from the Office of Summer Sessions, Murphy Hall, University of California, Los Angeles, California 90024. The 1970 Summer Session bulletin will be available from that office beginning in March.

### **Renewal of Application**

Applicants who failed to register in the quarter for which they were accepted in graduate status but who wish to register in a later quarter should file a Renewal of Application form. Such forms are obtained from the Admissions Section, Graduate Division, and should be submitted to that office. Filing dates are the same as those for original applications. The Renewal of Application should be accompanied by official transcripts, in duplicate, of any college or university work (including University Extension courses) completed since the former application. Acceptance for admission at any earlier date does not guarantee approval of the Renewal of Application.

Applicants seeking admission more than three years after their original application file new applications rather than Renewal of Application forms.

For applicants who have been offered admission but must enter military service before their first registration, the Graduate Division will extend admission to a later date. Such applicants should notify the Admissions Section immediately that they will not be able to register. Within the year after completing military service, the prospective student should inform the Admissions Section when he expects to enroll, and his admission will be arranged with the department. In these cases formal renewal of application is not necessary. After this one-year period, however, the normal pattern of formal renewal of application is followed.



# General Regulations

## READMISSION

A student who wishes to return to the University after an absence of more than one quarter must file an Application for Readmission. For the academic year 1970-1971, the schedule for application is:

For Fall Quarter 1970: All students returning in the same status (graduate or undergraduate) who did not complete the Spring Quarter, 1970.

For Winter Quarter 1971: All students returning in the same status (graduate or undergraduate) who were not registered in the Fall Quarter, 1970.

For Spring Quarter 1971: All students returning in the same status (graduate or undergraduate) who neither completed the Fall Quarter, 1970, nor were registered for the Winter Quarter, 1971.

## In Undergraduate Status

Undergraduate students may obtain application forms from the Office of the Registrar. The completed application along with transcripts of record from other institutions, including University Extension, attended during their absence must be filed with the Registrar on or before August 14 for the Fall Quarter; November 20 for the Winter Quarter; February 12 for the Spring Quarter.

## In Graduate Status

Students who have been registered at any time in graduate status at UCLA and wish to return after an absence should file a Graduate Application for Readmission. Forms for this purpose may be obtained by mail or in person from the Student and Academic Affairs Section, Graduate Division, and are submitted to that office in accordance with deadlines listed in the Calendar, page 5. Since some schools and departments permit readmission only in specified quarters or may stipulate earlier application deadlines, students should consult their chosen department for additional information.

Applications for readmission should be accompanied by:

1. Application fee of \$10 (nonrefundable), by check or money order payable to The Regents of the University of California.

2. Official transcripts of record, *in duplicate*, for all college and university work (including University Extension courses) completed since last registration at UCLA.

Formal application for readmission is not required of a student returning from an official leave of absence.

## INTERCAMPUS TRANSFER

Undergraduate students currently registered on any campus of the University in a regular session (or those previously registered who have not since registered at any other school) may apply for transfer to another campus by filing a form on their present campus. This form must be obtained and filed at the Office of the Registrar, together with an application for transcript of record, also available at the same office. The deadlines are the same as the admissions application deadlines given on page 23.

## REGISTRATION AND ENROLLMENT

Registration is the means by which one becomes a student at the University. It includes the payment of registration and other fees (described on page 45), and the completion and filing of informational forms for various purposes. Students are encouraged to register by mail. Continuing students may pick up material and instructions for registering by mail at the time (approximately the fifth week of instruction of the preceding quarter) and place announced on Official Bulletin Boards and DAILY BRUIN. New and re-entering students receive information and instructions for registering by mail with either their notification of admission or readmission or by means of a second mailing. There is a fee for late registration. Late registrations will normally be accepted after the announced registration period through the second week of classes. No student may register after the second week of classes.

Registration consists of the payment of fees, enrollment in classes, and the filing of various completed forms. A student's name is not entered on class rolls unless he completes registration and enrollment in classes according to instructions. Failure to complete and file all forms according to instructions may delay or even prevent the student from receiving credit for work undertaken.

### Continuous Registration

Unless granted a formal leave of absence, graduate students are expected to register every quarter, including the quarter in which their degree or certificate is to be awarded. If a student has completed all requirements for the degree except the filing of the thesis or dissertation and/or the formal final examination (master's comprehensive examination or doctoral final oral examination) he may pay the filing fee of \$50 instead of registering.

admission or readmission or by means of a second mailing. There is a fee

To be eligible to take final examinations, file theses or dissertations, or receive degrees during the summer, students must pay the filing fee in the summer, whether or not they are enrolled in a Summer Session.

### Physical Evaluation

Each student who enters UCLA for the first time, or re-enters after an absence of more than one quarter, is required to report at the Student Health Service dispensary (located in the Center for the Health Sciences) for a physical evaluation. This must be done prior to the date instruction begins (consult UCLA GENERAL CATALOG for this date).

Accepted students will be mailed appointments. Should one not be received by one week before the beginning of the quarter, as announced in the catalog, the student should call Student Health Service Physical Evaluations Division at (213) 825-2251 immediately for an appointment. A late fee is charged for failure to make and keep an appointment. Status in the University may be lapsed in the cases of those who do not comply as described.

The student must report at his appointed time and it will be decided whether or not a physical examination need be performed. An examination performed by a private physician and recorded on a Student Health Service form is usually

acceptable, but not mandatory. In most cases, only an evaluation of the Medical History by a member of the Student Health Service staff is necessary. In addition, tuberculosis clearance is required. A chest x-ray and perhaps a skin test for tuberculosis infection may be performed at the time of the physical evaluation, or the student may bring in an acceptable chest x-ray film dated within 12 months of the appointment, or may bring written proof of a negative skin test for tuberculosis performed within the same period of time. No charge is made for performing the physical evaluation and/or examination, nor for any test needed in connection with entrance to UCLA.

Regardless of which course is followed, appearance at Student Health Service at the appointed time is required. Under no circumstances should anything be mailed in prior to the appointment. Personal appearance is waived only in cases of extreme hardship, or when a student's academic work does not require him to come to the campus at all and he will neither mix with UCLA students nor make use of the Student Health Service facilities; a letter describing the situation will be given consideration.

Before coming to the University every student is urged to have his own physician examine him for fitness to carry on University work, and to have all defects capable of being remedied, such as dental cavities, defective hearing, or defective eyesight corrected. Students who wear contact lenses should come equipped also with ordinary eyeglasses to wear in case their eyes become inflamed. Prior to registration in the University, prospective students who have had a diagnosis of active tuberculosis will be required to present evidence that their disease has become inactive.

### **Conference with Faculty Adviser**

A normal procedure for every University student is to confer with a faculty adviser and obtain approval of a tentative program. The adviser will help the student to make a long-range plan for his degree objective and for preparation for graduate or professional study. He will acquaint the student with requirements of the University, his college or school, and his major department. Instructions regarding appointments with advisers are included with Notice of Appointments mailed by the colleges and schools, or with the notice of admission or readmission.

### **Enrollment in Classes**

In preparation for enrollment in classes a student should purchase from the Student Store the SCHEDULE OF CLASSES which lists courses, final examination groups, and names of instructors. From the schedule and with the aid of his adviser the student may assemble his program. He may not choose two courses in the same examination group. He should try to construct two or three alternate programs in case he is not admitted to the courses of his first choice.

Continuing students (old students who are eligible to register in the same status without filing applications for readmission) will have the opportunity to enroll in classes by mail. Materials and instructions for enrolling by mail may be obtained at the Office of the Registrar on dates to be announced on Official Bulletin Boards and in the DAILY BRUIN.

New and re-entering students, as well as continuing students who did not enroll by mail, will be given instructions for enrolling in classes when registering in person.

## THE STUDY LIST

A student's Official Study List is the list of courses in which he is officially enrolled at the end of the second week of classes. This is the official record of work to be undertaken during the quarter indicated. The student is responsible for every course listed, and can receive no credit for courses not entered on it. Unapproved withdrawal from or neglect of a course entered on the study list will result in a failing grade.

Changes in the Official Study List require approval of the Dean of the student's college, school or Graduate Division. Forms for this purpose may be obtained at the office of the student's dean. The approved petition must be filed at the Office of the Registrar.

### Study-List Limits

The minimal program for an undergraduate student is three courses (12 units). Exception to this regulation requires the approval of the dean of a student's college or school. Senate Regulations limits the undergraduate student to two courses (8 units) of credit per quarter in special study courses.

The normal program for an undergraduate student is four courses. However, a student on scholastic probation, except in the School of Engineering and Applied Science, is limited to a program of three courses each quarter, to which may be added a physical education activity.

For students in good academic standing, undergraduate study lists may be presented as follows:

**School of Engineering and Applied Science:** within the limits prescribed in each individual case by the Dean or his representative.

**College of Fine Arts:** three or four courses per quarter without special permission. After his first quarter, a student may petition to carry a program of not more than five courses if in the preceding term he attained at least a B average in a program of at least three courses.

**College of Letters and Science:** three or four courses for students in the first quarter of the freshman year. All other students who have a C average or better and are not on probation may carry three or four courses without petition. After the first quarter, a student may petition to enroll in as many as five courses if in the preceding term he attained at least a B average in a program of at least three courses. First-quarter transfer students from any other campus of the University may carry excess study lists on the same basis as students who have completed one or more terms on the Los Angeles campus. Entering freshmen who are enrolled in Naval R.O.T.C. may not carry more than four courses without petition.

**School of Nursing:** three courses. A student must petition to enroll in more courses.

The course in Subject A, which does not give credit toward a degree nevertheless displaces one course from a student's allowable program.

A physical education activity class may be added to these limits, but other physical education, all military science, and all repeated courses are to be counted in study-list limits.

Regulations concerning study-list limits for graduate students will be found on pages 153-154 of this bulletin.

### **Concurrent Enrollment**

Concurrent enrollment in resident courses and in courses in University Extension or another institution is permitted only when the entire program of the student has received the approval of the proper dean or study-list officer and has been filed with the Registrar before the work is undertaken.

## **GRADES AND SCHOLARSHIP REQUIREMENTS**

Grades in courses (graduate or undergraduate) are defined as follows: A, excellent; B, good; C, fair; D, barely passing; F, failure; and I, undetermined (work of passing quality but incomplete). The designations P, passed, and NP, not passed, are used in reporting grades for undergraduate students taking courses on a passed/not passed basis. Likewise S and U respectively are used in reporting satisfactory and unsatisfactory work by graduate students taking courses on this basis.

Grades A, B, C, D, F, P, NP, S, U are final when filed by an instructor in his end-of-quarter course report, except for the correction of a clerical error. No change of grade may be made on the basis of reassessment of the quality of a student's work. No term grade except incomplete may be revised by re-examination.

Repetition of courses is subject to the following conditions: (1) A student may repeat only those courses in which he received a grade D, F, NP, or U; however, the appropriate dean may authorize repetition of courses graded Incomplete. (2) Repetition of a course more than once requires approval by the appropriate dean in all instances. (3) Degree credit for a course will be given only once, but the grade assigned at each enrollment shall be permanently recorded. Courses in which a grade of D or F has been earned may not be repeated on a passed/not passed basis.

The grade Incomplete may be assigned when a student's work is of passing quality, but is incomplete. The student is entitled to replace this grade by a passing grade and to receive unit credit provided he completes the work of the course in a way authorized by the instructor.

### **Courses Taken Passed/Not Passed**

An undergraduate student may take courses on a passed/not passed basis subject to the following regulations:

(A) Except as provided in (C), (D), and (E) below, a student in good standing may enroll in one course each quarter on a passed/not passed basis. Courses thus passed shall be counted in satisfaction of degree requirements.

(B) A grade of passed shall be awarded only for work which would otherwise receive a grade of "C" or better.

(C) A student who has received two "not passed" grades shall be excluded from electing passed/not passed for one quarter.

(D) A department or school may designate any course or courses as ineligible for election by its majors on a passed/not passed basis, and may at its option require a student who has received a "passed" in such a course before changing his major to repeat the course for a letter grade.

(E) A student who has not elected the passed/not passed option in a preceding quarter may take two courses passed/not passed if one of these courses is of an advanced seminar or individual study nature and if this option is approved by the major department or school.

(F) With the permission of the dean of a student's college or school he may change his enrollment in a particular course from the passed/not passed basis to the regular letter grade basis at any time up to the final date for dropping the course.

### GRADE POINTS

For purposes of computing scholarship standing, a full course is counted as equivalent to 4 quarter units. Partial or multiple courses are counted proportionally.

Grade points per unit are assigned as follows: A-4, B-3, C-2, D-1, F and Incomplete (I) none. Upon removal of a grade I, the student is entitled to receive grade points only upon approval of the appropriate dean. The *grade-point average* is determined by dividing the number of grade points earned by the number of units attempted. A 2.0 (C) grade-point average on all work undertaken in the University—all campuses—is required for satisfactory standing as an undergraduate; a 3.0 (B) average for graduate.

Courses taken on a passed/not passed or satisfactory/unsatisfactory basis are disregarded in determining a student's grade-point average. In computing the grade-point average of an undergraduate who repeats courses in which grades of D or F were assigned, only the most recently earned grade and grade points shall be used for the first 16 units repeated. In the case of further repetitions, the grade-point average shall be based on all grades assigned and total units attempted.

### MINIMUM SCHOLARSHIP REQUIREMENTS

Students in all undergraduate colleges and schools are expected to maintain a grade-point average of 2.0 (C average) on all work undertaken in the University—all campuses. Failure to maintain this level normally results in probation. The following provisions apply to all undergraduate students at Los Angeles.

#### Probation

A student shall be placed on probation if he fails to maintain at least a grade C average for all courses undertaken in a quarter.



The probationary status of the student can be ended only at the close of a regular quarter and then only if a C average has been attained both on the term's work and on all work taken in the University of California—all campuses.

### Dismissal

A student shall be subject to dismissal from the University (a) if his grade-point average falls below 1.5 for any quarter, or (b) if after two quarters on probation he has not achieved a grade-point average of 2.0 (C average) for all courses undertaken in the University, or (c) if while on probation his grade-point average for work undertaken during any quarter falls below 2.0 (a C average).

Grade-point averages shall be computed on the basis of all courses undertaken in the University (all campuses), including courses graded I (Incomplete), but not including noncredit courses, courses taken in University Extension, or courses taken on a passed/not passed basis.

A student who fails to meet minimum scholarship requirements is subject to such supervision as the faculty of his college or school may determine. The faculty or its designated representative may dismiss a student subject to dismissal; may suspend his dismissal, continuing him on probation; or may readmit on probation a dismissed student.

### In Graduate Status

Scholarship regulations for graduate students will be found in the **STANDARDS AND PROCEDURES FOR GRADUATE STUDY AT UCLA**.

### Final Examinations

Final examinations are obligatory in all undergraduate courses except laboratory courses and other courses which are approved by the Committee on Courses. In laboratory courses final examinations are held at the option of the department in charge. All examinations will, so far as practicable, be conducted in writing, and a maximum time will be assigned beforehand for each examination, which no student will be allowed to exceed. The time for examination sessions may not be more than three hours.

If a final examination is one of the regular requirements in a course, there can be no individual exemption. Re-examinations are permitted only for the purpose of raising grade I to passing.

### Degree Requirements

In working toward a degree, the student should keep in mind the various levels on which he is to satisfy requirements. College or school and department requirements are discussed fully later in the sections *Colleges and Schools* and *Courses of Instruction*. The following are general University requirements for the bachelor's degree.

### SCHOLARSHIP

In order to qualify for a bachelor's degree\* the student must earn at least a

\* Candidates for teaching credentials must also maintain a C average in supervised teaching.

C (2.0) average on all courses undertaken in the University of California—all campuses.

### **SUBJECT A: ENGLISH COMPOSITION**

Every undergraduate entrant must demonstrate an acceptable ability in English composition. This requirement may be met by

1. Achieving a grade of 5, 4, or 3 in the College Entrance Examination Board (CEEB) Advanced Placement Examination in English, *or*

2. Achieving a satisfactory score in the CEEB Achievement Test in English Composition, *or*

3. Completing an acceptable college-level course in English composition with a grade of C or better.

Any student not meeting the requirement in one of the ways described above must, during his first quarter of residence in the University, enroll in a course of instruction, four hours weekly for one quarter, known as the *Course in Subject A*, without unit credit toward graduation. Should any student fail in the course in Subject A he will be required to repeat the course in the next succeeding quarter of his residence in the University.

A student who maintains in the course in Subject A a grade of A is permitted, on recommendation of the Committee on Subject A, to withdraw from the course at a date determined by that Committee, and is excused from the Subject A requirement.

Every student who is required to take the course in Subject A is charged a fee and the charge will be repeated each time he takes the course.

No student will be granted a bachelor's degree until he has satisfied the requirement of Subject A.

In respect to grading, conditions, and failure, the course in Subject A is governed by the same rules as other University courses.

Students from other countries whose native language is not English should take the Entrance Examination in English as a Second Language. Those who pass this special examination will be credited as having met the Subject A requirement, as will students who satisfactorily complete the advanced course in English for foreign students.

### **AMERICAN HISTORY AND INSTITUTIONS**

Candidates for a bachelor's degree must satisfy the "Requirement in American History and Institutions" by demonstrating a knowledge of American history and of the principles of American institutions under the federal and state constitutions. This requirement may be met by one of the following methods:

1. By satisfactory completion of one course chosen from the following list: Economics 10; History 7A, 7B, 171A, 171B, 172A, 172B, 173A, 173B, 174A, 174B, 175A, 175B, 176A, 176B, 177A, 177B, 178A, 178B, 179A, 179B, 180A, 180B, 188; Political Science 1, 114, 143, 144, 145, 171, 172A, 172B, 180, 186.

Equivalent courses completed in the University Extension may be used to fulfill the requirement. Equivalent courses taken at other collegiate institutions and accepted by the Board of Admissions may also be used to fulfill the requirement.

2. By passing two optional examinations (one in American History and one in American Institutions) which the Committee on American History and Institutions offers for the purpose of satisfying the requirement. (Normally the examinations are offered once each quarter. No course credit is given for the examinations.)

3. By presentation of a certificate of satisfaction of the present California requirement as administered in another collegiate institution within the State.

Candidates for a teaching credential, but not for a degree, need take only the optional examination in American Institutions or one of the courses listed above under 1.

An alien attending the University on an "F-1 or J-1" student visa may, by showing proof of his temporary residence in the United States, petition for exemption from this State requirement.

Further information regarding the requirement and the optional examinations may be obtained from the Committee on American History and Institutions, Room 6248, Ralph Bunche Hall.

### **SENIOR RESIDENCE**

Of the last 45 units which a student offers for a bachelor's degree 35 must be earned in residence in the college or school of the University of California in which the degree is to be taken. When translated to the course structure at UCLA this normally implies that nine of the last 11 courses a student offers for a bachelor's degree must be earned in the college or school in which the degree is to be taken. Not more than 18 of the 35 units may be completed in Summer Session on the campus of residence.

### **CANDIDACY FOR A DEGREE**

A student should announce his candidacy for the bachelor's degree at least three quarters before he expects to receive the degree by completing the Announcement of Candidacy Card (A-card) in the Registration Packet. The completed A-card must be filed (even though one or more were filed at earlier registrations) during the first two weeks of instruction for the quarter in which a student expects to complete the work for the degree. Announcements accepted later in the quarter are subject to a late fee.

### **Change of College or Major**

A change of college (or major) by an undergraduate student requires the approval of the college (or department) to which admission is sought. Applications are made by petition, which may be obtained from the college or school office. No student is permitted to change his major after the opening of the last quarter of his senior year.

A graduate also makes applications for a change in major by petition, which may be obtained at the Office of Student and Academic Affairs Section of the Graduate Division.

### **Withdrawal from the University**

A student withdrawing from the University within the course of a quarter must file with the Registrar's Office an acceptable Notice of Withdrawal. Failure

to do so will result in nonpassing grades in all courses, thus jeopardizing his eligibility to re-enter the University of California or his admission by transfer to another institution. Forms containing complete instructions are issued at the office of the dean of the student's college, school or Graduate Division or Window A, Office of the Registrar. The completed form must be filed at the Registrar's Office Information Window after necessary clearances are obtained. Current Registration Card, UCLA Student Identification Card, and tuition and incidental fee receipts must be turned in with the completed Notice of Withdrawal.

A student who withdraws within the course of a quarter must file an Application for Readmission (see page 33) for the quarter in which he proposes to return to the University provided a quarter—including the period between the Spring and Fall quarters—has intervened since the withdrawal. Such application is necessary in order that the Registrar may be prepared to register the student. The deadlines for filing applications for readmission are not later than six weeks before the beginning of the quarter in which the students wishes to re-enter..

### **Transcript of Record**

Upon formal application to the Registrar a student may have issued on his behalf transcripts of his record on all work taken at UCLA in either regular or summer sessions. A fee of \$1 is charged for each transcript, except for those required for the intercampus transfer of undergraduate students within the University which are provided without charge.

## **STUDENT CONDUCT AND DISCIPLINE**

A student enrolled in the University assumes an obligation to conduct himself in a manner compatible with the University's function as an educational institution. Rules concerning student conduct, student organizations, use of University facilities and related matters are set forth in both University policies and campus regulations, copies of which are available upon request at the Office of Dean of Students, 2224 Murphy Hall and the Office of Student Activities, 312 Kerckhoff Hall.

Particular attention is called to the booklet UNIVERSITY OF CALIFORNIA POLICIES RELATING TO STUDENTS AND STUDENT ORGANIZATIONS, USE OF UNIVERSITY FACILITIES, AND NON-DISCRIMINATION and to the standards of conduct set forth therein.

# Expenses, Financial Aids, Housing

## GENERAL EXPENSES AND FEES\*

The question of expense while attending the University is of importance to every student. It is difficult, however, to give specific information about yearly expenditures. In a student body of some thirty thousand members there are so many different tastes, as well as such a wide range of financial resources, that each student must determine his budget in keeping with his own needs and financial condition. It is possible to live simply, and to participate moderately in the life of the student community, on a modest budget. The best help the University authorities can offer the student in planning his budget is to inform him of certain definite expense items, and acquaint him with others for which he will in all probability have to provide.

An estimated budget for the academic year is given on page 46.

Fees and deposits are payable preferably in cash. If a check is presented the face amount should not exceed all the fees to be paid and must be made payable to The Regents of the University of California.

## Fees Assessed All Students

A Registration Fee of \$100 and Student Union Fee of \$4 must be paid by all undergraduate and graduate students when registering each quarter. In addition to the above fees all undergraduate students must pay each quarter an Educational Fee‡ of \$50 and an Associated Student Fee of \$4.50, while all graduate students must pay each quarter an Educational Fee‡ of \$60 and a Graduate Students Association Fee of \$3. The Registration Fee covers certain expenses of students for counseling service, for library books, for athletic and gymnasium facilities and equipment, for lockers and washroom,† for registration and graduation, for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished on the campus by the Student Health Service, and for all laboratory and course fees. Membership in the Associated Students (see page 61) or Graduate Students Association (see page 61) is covered by the Associated Student and Graduate Students Association fees respectively. No part of these fees is remitted to those students who may not desire to make use of any or all of these privileges. If a student withdraws from the University within the first five weeks of the quarter, a part of these fees will be refunded.

## Nonresident Tuition Fee

Students who have not been bona fide residents of California for more than one year immediately prior to the opening day of the quarter in which they register are charged, along with other fees, a tuition fee of \$400 for the quarter. (Government Code Section 244 and Education Code Section 23054, 23055 and 23057.) Legal residence is the combination of physical presence and the inten-

\* All fees are subject to change without notice. Payment of registration fee is a part of registration. Other fees are payable at Cashier's Office which is open from 8:30 a.m. to 4 p.m. daily.

† Lockers are issued, as long as they are available, to registered students who have purchased standard locks. Locks are sold at \$1.25 each, and may be used as long as desired, or may be transferred by the purchaser to another student.

‡ Resident Students in the Schools of Dentistry and Medicine are not charged the Educational Fee until 1971-1972.

tion of making the state one's permanent home. New and returning students are required to fill out a Statement of Legal Residence, a form that is issued at the time of registration. Their status is determined by the Attorney in Residence Matters, 590 University Hall, University of California, Berkeley 94720, or by his deputy in the Registrar's Office. All correspondence concerning residence should be addressed to that official as he has the sole authority to determine residence classification.

The attention of the following students is directed to the fact that presence in California for more than one year does not, in itself, entitle them to resident classification: (1) Those under 22, whose parents are not California residents; (2) Veterans who were not California residents at the time of entry into the Armed Forces; (3) Alien students who first must qualify for permanent residence status according to the applicable laws of the United States. Exemption from payment of the tuition fee may be granted to the unmarried minor whose parent is in the active military service of the United States and is stationed in California on the opening day of the quarter for which the minor registers.

Those classified incorrectly as residents are subject to reclassification as non-residents. If incorrect classification resulted from false or concealed facts, the student is subject to University discipline and is required to pay all back fees he would have been charged as a nonresident. Resident students who become non-



residents must immediately notify the Attorney in Residence Matters or his deputy. Application for a change in classification with respect to a previous quarter is not received under any circumstances.

Part of the fees may be refunded to students who withdraw within the first five weeks of the quarter. A separate circular, **STUDENT FEES AND DEPOSITS**, gives information on refunds. This circular is available from the Registrar.

### FOR REDUCED PROGRAMS

For the undergraduate student enrolled in less than three courses, the non-resident tuition fee is \$136 per course or the proportionate part for a fractional course. For graduate students the tuition is \$400 per quarter regardless of the number of courses undertaken. There is no reduction in Registration, Student Union or ASUCLA fees.

### Other Fees\*

Application fee, \$10. This nonrefundable fee is charged every undergraduate applicant for admission, readmission, or intercampus transfer to the University and every graduate applicant for admission and readmission to the University.

Acceptance of admission fee, \$50. For undergraduates only. The fee is non-refundable, but is applied toward the University Registration Fee.

Returned check collection, \$5.

Physical examination—second or late appointment, \$4. Original appointment, or deferment arranged in advance, no fee.

Late registration, \$10. When permitted.

Late filing of study (enrollment in classes) list, \$10. When accepted.

Duplicate registration and/or other cards in registration packet, \$3 each petition.

Change in study list after the first two weeks of instruction, \$3 each petition. When dropping, substituting, or adding a course.

Removal of grade E or I, \$5 each petition.

Reinstatement fee, \$10. Reinstatement after a status lapsed.

Late filing of announcement of candidacy for the bachelor's degree, \$3.

Candidacy for Ph.D., Ed.D., or Dr.P.H., \$25.

Special course Subject A, \$45.

Duplicate diploma, \$20. Replacement cost upon presentation of evidence original is lost or destroyed.

Late application for teaching assignment, \$1.

Late return of athletic supplies, † \$1 for each 24 hours until full purchase price of article is reached.

Failure to empty locker within specified time, \$5.

Transcript of Record, \$1 each.

Master's thesis and doctoral dissertation filing fee, \$50. For the graduate student who is not registered and who has completed all formal requirements for the degree except the filing of a thesis or dissertation and/or the completion of a formal final examination.

\*Fees are subject to change without notice.

† Supplies or equipment not returned before the close of the fiscal year must be paid for in full; return after that date is not permitted.

**Principal Items of Expense**

Estimated for a college year (three quarters)

EXPENSE ITEM	COST	REMARKS
Registration Fee .....	\$ 300.00	Actual cost.
Educational Fee .....	150.00	The Educational Fee for graduate students is \$180.00.
Student Union Fee.....	12.00	Actual cost.
ASUCLA Membership Fee .....	13.50	Membership required of undergraduates; optional for graduate students; however, \$9.00 Graduate Students Association Membership Fee is required.
Books and Supplies.....	150.00	Approximate cost.
Board and Room.....	1,115.00	Room and Board (20 meals/week) for three quarters in a University residence hall costs, on the average, \$1,009. In addition there is a \$29.40 telephone service fee and a \$12 residence hall association membership fee. An additional sum should be budgeted to cover the one meal a week not provided in the University residence halls or in other residence facilities. The cost of remaining on campus during school recesses is not included in the basic residence hall contract. These supplementary board costs may amount to \$65.00 a year. (A refundable deposit of \$30 for breakage is also required.)
Miscellaneous .....	470.00	An average allowance for variable items such as clothing, transportation and parking, medicine and drugs, laundry and dry cleaning, recreation, and the cost of a round trip from home to campus is suggested.
<b>Total .....</b>	<b>\$2,210.00§</b>	An average budget for a student who is a California resident and who lives in a University residence hall. A reasonable budget for those not housed in a University dormitory will be approximately \$2,250 for three quarters. Students classified as nonresidents of the State must also add to their estimated budgets the tuition fee of \$1,200 to the above budget.

§ Because of rising costs, the above estimate of expenses may be subject to change.



## FINANCIAL AIDS FOR STUDENTS

Financial aids offered by UCLA include scholarships, loans, grants, and Federal Work-Study eligibility certification. Application may be made for one or more types of aid and *one basic application* suffices for all available financial aid. If the student applies for all types of aid, a suitable combination of aids for which he qualifies may be offered. Awards are based on financial need as determined by College Scholarship Service criteria. **ALL APPLICANTS EXCEPT FOREIGN STUDENTS MUST SUBMIT A PARENTS' CONFIDENTIAL STATEMENT.** Entering students may obtain this form from their high school counselor or from the College Scholarship Service, Box 1025, Berkeley, California 94701. Continuing students should obtain this form from the UCLA Financial Aids Office. Foreign students are to submit a Non-Immigrant Foreign Student Application instead of the Parents' Confidential Statement.

### Educational Fee Deferment

All students receiving aid are expected to accept a deferment of the new Educational Fee of \$150 for undergraduates and \$180 for graduates. This deferment is made in the form of a loan to the student. No interest is charged while the student is attending an institution of higher learning but 3% interest will be charged from the date he completes his education. Payments are to begin nine months following that date.

### Undergraduate Scholarships

#### REGENTS SCHOLARSHIPS

Students who have achieved an outstanding academic record and show a high degree of promise are eligible for Regents Scholarships. Four-year (12 quarters) awards are made to students entering from high school and two-year (6 quarters) awards to continuing students and those transferring from another university or college who will have completed the sophomore year by the end of the spring quarter. Each Regents Scholar receives an honorarium of \$100 and, if he needs financial assistance, a stipend in an amount determined according to criteria established by the College Scholarship Service.

#### PRESIDENT'S AND UNIVERSITY SCHOLARSHIPS

Awards designated as either President's or University Scholarships are available in amounts ranging, in most instances, from \$350 to \$1,000. Awards are based on grade-point average and financial need.

#### ALUMNI SCHOLARSHIPS

The UCLA Alumni Association, in conjunction with the University, provides scholarships for entering California freshmen which range in amount from \$400 to \$1,500. Awards are based on grade-point average, financial need, leadership and promise.

Special Alumni Scholarships are available to high school students in particular geographical areas and school districts. Eligible students without financial need are awarded honorariums.

## **SPECIAL SCHOLARSHIPS**

A number of special scholarships are offered through the University to students meeting various qualifications. Included are awards for California Seal-bearers, physically handicapped persons, descendants of Civil War veterans, students interested in engineering, and many others.

A limited number of scholarships are available to nonresident students, including foreign students who have completed at least one quarter or semester of study in the United States.

## **MINIMUM REQUIREMENTS FOR APPLICATION**

High school graduates entering the University as freshmen must have a grade-point average of 3.2\* or better in the subjects accepted in fulfillment of the admission requirement of the University.

Continuing students at UCLA or students transferring from other campuses of the University must have a grade-point average of 3.0\* or better.

Students entering from a college or another university must have had a high school grade-point average of 3.2\* or better and a college or university grade-point average of 3.0\* or better.

Scholarship stipends are based on the recipient's financial need. All students must submit the Parents' Confidential Statement to the College Scholarship Service by December 20. When applicable, the Non-Immigrant Foreign Student Application should be submitted directly to the Financial Aids Office by January 15.

## **SCHOLARSHIP APPLICATION PROCEDURE**

Both continuing and entering students may obtain the necessary application forms after October 15 by mail or in person from the Financial Aids Office. Students entering from California high schools are urged to obtain their applications from their high school counselors.

Continuing students should ask for the continuing student application. Entering students should ask for an entering student application. The completed application should be submitted to the Financial Aids Office by January 15.

Foreign students must have completed at least one quarter or semester of study in the United States in order to be eligible for a scholarship.

## **Graduate Awards and Appointments**

For information concerning opportunities for graduate student support, consult the UCLA brochure titled, **GRADUATE FELLOWSHIPS AND ASSISTANTSHIPS**, available from the Fellowship and Assistantship Section of the Graduate Division.

## **Prizes**

The generosity of alumni and friends of the University provides each year for competitive prizes and awards in several fields. Selections will be made by

\* However, because the number of qualified applicants far exceeds the funds available, scholarships are awarded on a competitive basis.

committees in the various academic departments concerned. The names of the recipients of these awards will be included in the Commencement Bulletin issued annually. Further information may be obtained from the Financial Aids Office, 2240 Murphy Hall.

## Loans

Three types of loans can be secured through the Student Loan Office by registered UCLA students in good standing who are in need of financial aid for educational purposes. Students who are registered *only* in University Extension are not eligible.

### UNIVERSITY LOANS

University loans are available at any time during regular sessions. Those desiring to secure a loan should request an appointment with a Financial Aids Counselor. At least three weeks are required for processing the application.

The amount which may be borrowed is based on school-related needs as determined by College Scholarship Service criteria. Depending upon the size of the loan, the applicant must have either one or two comakers who meet University requirements. Cosigners' signatures must be notarized.

No interest is charged while the student is in attendance at the University. After the student has left UCLA, the interest rate is 3 per cent per annum on the unpaid balance. Since these funds are needed to assist other students, repayments are normally scheduled to begin as soon as possible. If repayments cannot be made according to schedule, the borrower must have an adjustment approved by a Financial Aids Counselor.

### EMERGENCY LOANS

Emergency loans in small limited amounts may be obtained and are to be repaid within 30 days. Money is granted at the time of application in conformity with the emergency nature of the loan.

### NATIONAL DEFENSE STUDENT LOANS

National Defense Education Act loans are restricted to students who are U. S. citizens or permanent residents. Depending on their need, determined according to College Scholarship Service criteria, undergraduates may be granted up to \$1,000 for the academic year (not to exceed a total of \$5,000). Ceilings on graduate loans are higher, but all students are limited to a percentage of their need because of the heavy demand and limited funds. Applications (in addition to those submitted by Scholarship applicants) should be submitted by January 15 for the following academic year.

Repayments become due nine months after the student leaves UCLA but may be extended over a ten-year period. Deferment of repayment is possible for members of the armed forces and the Peace Corps, Vista volunteers, and students who transfer to other schools. A portion of these loans may be forgiven borrowers who are veterans and those who enter the teaching profession. A notarized Loyalty Oath will be required at the time the loan is awarded.

### **GUARANTEED LOAN PROGRAM**

These Federally Insured Loans are made available to students from middle- or upper-income families by local banks and other financial institutions. Full-time students may obtain an application from their local bank, their designated State Agency or Regional Health, Education and Welfare Office, or from the UCLA Financial Aids Office (if they are a California resident). Applicants are required to be interviewed by a UCLA Financial Aids Counselor in order to be recommended for such loans. The Application must be approved by the student's bank and by the designated State Agency or Regional HEW Office.

### **Educational Opportunity Grants**

A limited number of these Federal EOG grants will be offered to entering students who have **EXCEPTIONAL** financial need. These awards are governed by Federal regulations and **MUST** be matched by an equal amount of acceptable matching funds (i.e., scholarship, loan, or work-study job).

### **Self-Support and Student Employment**

Many students earn part, and a few earn all, of their expenses while attending the University. The University authorities are eager to offer as much encouragement as possible to students who must maintain themselves, but long experience has brought out the fact that the self-supporting student, early in his college life, may have to face unforeseen problems which affect his welfare.

University work demands the best that a student can give it. The following statements are made, therefore, not to discourage the able student who must do outside work, but to provide him with facts and information so that he may plan carefully and intelligently.

1. Whenever possible, it is wise for a student to use his savings to make the first term of residence in the University one of freedom to give full time to academic work. He may then have an opportunity to adjust himself to new surroundings, to establish sound habits of study, and to maintain a good scholastic standing, and thereby build a foundation for the rest of his University course. By the end of the first quarter the student should know the demands of University life and his own capabilities well enough to make it possible to plan, for subsequent quarters, a combined program of studies and work for self-support.

2. The regular undergraduate four-year course based on an average of four courses per quarter is organized on the supposition that students will give the major part of their time and attention to their studies while attending the University. Therefore, a student who must give considerable time and energy to outside work should consider at the outset the possibility that more than the usual twelve quarters (four years) may be required to complete the program for the degree, if he is to maintain his scholastic standing and his health, and to enjoy the advantages of University life.

With reasonable diligence, a student in good health carrying an average program of study in the undergraduate departments can give as much as fifteen hours a week to outside employment without seriously interfering with his college work; employment in excess of this amount should be accompanied by a reduction of the academic program carried.

## EMPLOYMENT OPPORTUNITIES

The University maintains a Placement and Career Planning Center which offers regularly enrolled students part-time and summer employment. Wives of regularly enrolled students are eligible for assistance in seeking part-time or full-time work.

Placement interviewers are available for consultation with any student who may not be seeking immediate employment but is concerned with his future career prospects and wishes vocational information or guidance.

The Federal Work-Study Program is designed to create jobs for students from low-income families and offers a wide range of work opportunities on campus and with community nonprofit agencies. The eligibility of all applicants must be certified by the Financial Aids Office. Work under this program is restricted to a maximum of 15 hours per week during the academic year and to full time during all vacation periods. If they meet the criteria of need, high school graduates admitted to the University may secure full-time employment in the quarter immediately prior to registration. Work-Study jobs are available to full-time students throughout the year.

## LIVING ACCOMMODATIONS\*

The different types of living accommodations which are available to students are: University residence halls; cooperatives; private residence halls; privately owned rooms and apartments; sororities or fraternities; or the Married Student Apartments.

### University Residence Halls—(Single Students)

Four coed residence halls accommodate undergraduate students. Graduate students (21–29 years of age) are accommodated in a coed graduate hall.

Rooms (shared by two students) are furnished with studio beds, desks, draperies, bedspreads, bed linen, pillows, and towels. Students must furnish blankets. There is a telephone in each room.

The rate for room and board (exclusive of recesses) is approximately \$1100 for the academic year (Fall, Winter and Spring Quarters), including a telephone fee and membership fee in the residence hall student association. The rate is prorated for portions of the year. Three meals are served daily except Sundays and University holidays when two meals are served. Room and board may be paid in installments as authorized by the University.

### ASSIGNMENTS TO RESIDENCE HALLS

Factors considered in making assignments are: acceptance of admission, post-mark date that residence hall application was mailed, class in the University, and home area. Residence hall assignments are mailed beginning about July 1 for the academic year beginning in the fall; about November 15 for the Winter Quarter and February 15 for the Spring Quarter.

\* Rates and information subject to change.

## University Married Student Apartments

The University maintains the Park Vista and Sepulveda Park apartment complexes which consist of 643 unfurnished one-, two-, and three-bedroom apartments, and are located on Sawtelle and Sepulveda Boulevards, approximately five miles from campus.

The basic monthly rates range from \$90 to \$145 per month. The utilities are not included in the rates. In a few of the apartments drapes and carpeting have been installed for which there is a small additional charge.

Assignments are made only to the full-time student member of the family and are nontransferable to another member of the family. To remain eligible for housing all assigned students must be enrolled for not less than three of the four quarters, e.g., Fall, Winter and Spring Quarters, with Summer attendance not required if student is pre-enrolled for the following Fall Quarter.

Only the student and his immediate family may live in the apartment. Extension students are not eligible.

## Privately Operated Residences

### COOPERATIVES

There are several privately owned, nonprofit, member controlled, student living groups located adjacent to the UCLA campus. Each student is required to work 3-5 hours per week as part payment of room and board. Each cooperative has a manager, housemother, or head resident responsible for supervision and management. The Cooperative Housing Association is for men and women; YWCA, Twin Pines, and Stevens House are for women only. Room and board rates vary from approximately \$210 to \$250 per quarter.

### PRIVATE RESIDENCE HALLS

Weyburn Hall and La Mancha Hall accommodate both men and women in rooms accommodating two students, or (in La Mancha) suites and private rooms. The rate for room and board for the academic year (Fall, Winter and Spring Quarters) if paid by the quarter, varies from approximately \$1443-\$1818.

### FRATERNITIES AND SORORITIES

Most of the fraternities and sororities own or lease homes near the campus and provide lodging and meals for their members and pledges. Expenses for residents range from about \$100 to \$125 per month depending upon the number of meals served and the social and recreational privileges included. Students interested in affiliating with a sorority or fraternity should contact either the Panhellenic Office (for sororities), care of the Dean of Women's Office, 2241 Murphy Hall, 405 Hilgard Avenue, Los Angeles 90024, or the UCLA Interfraternity Council (for fraternities) at P.O. Box 111, 308 Westwood Plaza, Los Angeles, California 90024.

**PRIVATE LANDLORDS****For Single and Married Students**

Room and apartment rental listings are available to any student who desires to call *in person* at the Office of Housing Services. Since the listings change from day to day, arrangements for such accommodations cannot be made by mail. Students planning to live in rooms or apartments are advised to arrive on campus at least a week or ten days prior to the opening of the term.

The University does not inspect accommodations nor make rental or other arrangements on behalf of students. Such transactions must be made individually and directly with landlords. Students are advised to have a clear understanding, preferably in writing, of the terms and conditions of occupancy.

Only a very few places offer room and board at about \$150 per month. Rooms in private homes cost from \$50–\$75 per month. Single and bachelor apartments, usually furnished, rent for \$90 and up. Depending upon whether the apartment is furnished or unfurnished, as well as the location, rental prices for 1- and 2-bedroom apartments, \$150 and up. Rental prices for houses are appreciably higher.

Students who are not boarding by the month can obtain moderately priced meals at the cafeteria in the Ackerman Union, or at one of the many restaurants in Westwood Village adjoining the campus.

**MOTELS AND TRAILER COURTS**

Motels are located from one to five miles from campus with varying rates and accommodations. It is sometimes advisable for single or married students to accept these accommodations temporarily until more permanent accommodations can be located. Listings may be secured from the Office of Housing Services.

No trailer parking areas are provided on or adjacent to the campus.

**TRANSPORTATION TO CAMPUS AND PARKING**

Student parking facilities on campus are limited and are subject to a parking fee. Since the full demand cannot be met at the present time, the use of public transportation, car pools, bicycles, and motor scooters is encouraged whenever possible. Please contact the Southern California Rapid Transit District or the Santa Monica Municipal Bus Lines for information regarding bus schedules in this area.

**Automobile**

A limited number of parking permits will be sold to students. Those students with physical disabilities which preclude walking long distances may apply for permits through the Student Health Service. All other students must file parking petitions with the Campus Parking Service, Room 280, Gayley-Strathmore Structure (Area 8). Petitions will be processed on IBM cards utilizing a point system established on the basis of need. Permits approved for the fall quarter can be renewed for the winter and spring quarters for continuing students and

new petitions need not be filed. However, new or re-entering students for each quarter must file parking petitions. Deadlines for filing and for renewing permits will be established for each quarter. Inquire at Campus Parking Service for additional information.

### **Bicycle, Motor Scooter and Motorcycle**

Bicycle racks and scooter parking areas are provided at convenient locations throughout the campus. Registration of motor scooters and motorcycles is not required. Parking regulations, guide maps indicating the location of parking facilities, and additional information may be obtained from Campus Parking Service. Registration of bicycles is not required.



# Student Services and Activities

## STUDENT HEALTH SERVICE

This facility provides complete medical, surgical, and hospital care for short-term illnesses and injuries, diagnosis and emergency treatment for dental conditions, and guidance and limited treatment for chronic diseases. This care is given in the Student Dispensary and Student Hospital Ward, located in the Center for the Health Sciences, and in the Emergency Station in the Pauley Pavilion. Arrangements have been made whereby the resources of other facilities in the Health Sciences Center and the associated Neuropsychiatric Institute can be utilized in the care of student patients, with a minimum of formality and loss of time. With these unexcelled resources practically any condition can be treated provided it is one which is eligible for care under Student Health Service auspices.

Any student who has paid the full incidental fee or the special health service fee may use the Student Health Service. Current expenses are met chiefly by allocations from these fees. Charges are made for filling certain types of prescriptions, for missed appointments, and for a few other items. No additional charges are made for consultations with specialists, X-ray examinations, laboratory tests, hospital care, major or minor surgery, immunizations, dental examinations, or emergency dental treatment. A limited amount of routine dentistry is available on a fee basis for students who are unable to visit their regular dentists.

Eligible students are given care from the first until the last day of the quarter; at the discretion of the Director an additional seven days of care may be given after that. Prospective students arriving from a considerable distance are given emergency care for several days prior to the first day of the quarter; if later they fail to register they are charged for this service. A student registered in any quarter, who intends to register again in the quarter immediately following, is eligible for complete service during the interval between quarters. A continuing student who does not register for any quarter is not eligible for any service during that quarter; he may, however, be given minor services as a courtesy when time permits. An exception is made in the case of graduate students who are on campus to work toward a degree, and foreign students who remain on or near the campus. Such students, though not currently registered, may obtain full service during the quarter by paying a special health service fee at the beginning of the period to be covered.

Students enrolled in Summer Session are eligible for care by virtue of paying a health service fee at the start of the session. Students in University Extension are not eligible for any services, the only exception being in the case of foreign students who pay a health service fee at the beginning of the period to be covered.

A student's eligibility for care by the Student Health Service ceases immediately if he withdraws from the University.

The Student Dispensary, located on "A" floor of the Center for the Health Sciences, is open from 8 a.m. until 5 p.m., Monday through Friday, and from

8 a.m. until noon on Saturday. It is closed on Sundays and administrative holidays. The Student Dispensary houses: (a) A General Clinic where students with all kinds of ailments are seen without appointment. (b) A wide variety of Special Clinics where students are seen chiefly by appointment, after referral from the General Clinic or another Special Clinic. Exceptions are the Dental Clinic and the Psychiatric Clinic, where any student may apply directly without referral. (c) Clinical Laboratory, X-ray, pharmacy, and other ancillary services. (d) An immunization station which operates from 8 a.m. until 4:30 p.m., Monday through Friday; an appointment is not required except in the case of yellow fever vaccination.

Emergencies are regularly treated at the Student Dispensary, or at the Emergency Station in the Pauley Pavilion, during the hours they are open. (The Pauley Pavilion Emergency Station is open from 2 p.m. until 7 p.m., Monday through Friday. It is especially staffed and equipped to provide prompt expert care for athletic injuries.) When these facilities are closed, students in need of emergency care are treated at Student Health Service expense (except for the first \$5.00 of the fee, which is charged to the student) in the UCLA Hospital Emergency Room; ambulance and other serious cases in need of immediate specialized emergency treatment are treated there at any time. The Student Health Service is not responsible for ambulance fees, except when previously authorized in connection with on-campus emergencies.

The Student Hospital Ward is a unit of the UCLA Hospital. Upon recommendation of the Director of the Student Health Service an eligible student may be given up to 10 days of hospital care. During regular hours students are admitted to the hospital by referral from the Student Dispensary; at other times they are admitted by way of the hospital Emergency Room. In the case of illness or injury requiring long-continued care (tuberculosis, mental disease, severe spinal injury, etc.) where the condition obviously will prevent the student from returning to classes during the current quarter, he will be released to the care of his family or the community as soon as this is safely possible. A student who is still in the hospital at the end of the quarter will likewise be released to other care as soon as this can be done with safety.

### Limitations

The services provided are limited by the staff, space and facilities available. These limitations are felt especially keenly in the Psychiatric and Dental Clinics, where only a small proportion of students requesting routine services can be accommodated. The General Clinic is subject to recurring periods of overcrowding during which only preliminary service is possible for any but the most urgent conditions. Furthermore, it is against Student Health Service policy to provide the following: (1) Surgical correction of conditions existing at the time of entrance or re-entrance to the University; (2) Eyeglasses, or visual refraction for eyeglasses; (3) Routine dentistry, except under special conditions; (4) Obstetrical care, or the care of dependents; (5) Premarital examinations, other than the giving of general advice and performance of the required blood test; (6) Care, other than first aid, for conditions compensable under the work injury laws (industrial accidents); (7) Care of conditions for which a surgical operation has

been performed, a plaster cast applied, or other definitive treatment begun elsewhere, except when it would be impracticable for a student to return to his original doctor; (8) Care of chronic conditions for which a student has been under the care of an outside doctor, unless the latter recommends that the student be transferred to our care while attending the University; (9) Ambulance or other transportation; (10) Wheelchairs or special orthopedic apparatus; (11) Filling of prescriptions for drugs, or requisitions for x-rays or laboratory tests originating with outside doctors.

### Care Off Campus

When visiting another University of California campus a UCLA student is eligible for treatment of an acute illness or injury at the health center under the same conditions that apply to students enrolled on that campus. He must show his registration card to identify himself. While a student is off campus participating in an officially sponsored field trip, sport event, or recreational outing, necessary medical expenses incurred because of injury or sudden illness are covered by insurance carried by the Regents of the University. This policy does not cover any care which the student could reasonably have obtained through the Student Health Service.

### Supplemental Medical Insurance

A student can receive care through the Student Health Service only if he is able to come to the health center on a University of California campus for it. Students are not eligible for care during a quarter in which they are not registered or have not paid a health service fee. Eligibility for service ceases immediately if a student withdraws from the University. There is no provision for replacing teeth lost in accidents. Large medical and hospital expenses incurred in these and certain other situations in which a student is not covered by the Student Health Service may be covered in part by purchasing a *Student Accident and Sickness Medical Expense Plan for Members* which is sponsored by the Associated Students of UCLA. This insurance is offered for a very low premium. It is available only at the beginning of each quarter. For an additional premium an insured student may also insure his wife and children. For all foreign students, except those who are in the United States on a permanent immigrant visa, the acquisition of satisfactory health insurance is a condition of registration in the University of California.

## STUDENT COUNSELING SERVICES

The Counseling Services are designed primarily for the voluntary use of any regularly enrolled student. These services are not a part of an administrative unit such as an academic college or department. They offer the student the opportunity, on his own initiative, to consider with a counselor any questions, concerns, skill needs, hopes, dilemmas, crises, or choices that may occur during the college years. There is no charge for these services. The staff is composed of counseling and clinical psychologists and professionals familiar with the needs and interests of college students. The Services are found in three locations:

The Counseling Center (Murphy Hall 3334) offers individual and group counseling to assist students in coping with any concerns or difficulties that may be interfering with their effectiveness at the University or may be involved in their continued growth. Marriage and premarital counseling is available. Counseling is private and confidential; no records of interviews are kept.

The Center for Reading and Study Counsel (Social Welfare 271) offers individual and group programs designed to assist students in the development of reading, writing and study skills, and habits appropriate to the demands of their University studies. Counseling and instructional staff is available. Students may enroll in a program at any time during the quarter.

The Educational and Career Information Service (Murphy Hall 3329) maintains an extensive collection of current materials concerning occupations, colleges, universities and professional schools. These materials are for use by students as an aid in better informing themselves when making educational and career decisions. Counseling personnel are available as needed to assist the student in the use of the materials and in the further clarification of his educational and career objectives.

## **RESERVE OFFICERS' TRAINING PROGRAMS**

### **Army Reserve Officers' Training Corps**

In accordance with National Defense Act of 1920, and with the concurrence of the Regents of the University, a unit of the Senior Division Reserve Officers' Training Corps was established on the Los Angeles campus of the University in July, 1920.

The purpose of the Army ROTC is to qualify male students as leaders in their chosen fields, as far as the requirements of the service permit: engineering, communications, administration, logistics, personnel management, intelligence, and many others. The ROTC program qualifies graduates for commissions as officers in the United States Army Reserve and selected graduates for commissions in the Regular Army.

The choice of programs in general military science has been expanded to provide Army commissions to successful cadets after completion of both two and four years of Military Science. One, two, three and four year scholarships are offered in the four year program. See page 390 for details of this program.

### **Naval Reserve Officers' Training Corps**

By action of the Secretary of the Navy and of the Regents of the University of California in June, 1938, provision was made for the establishment of a unit of the Naval Reserve Officers' Training Corps on the Los Angeles campus of the University.

The primary objective of the Naval Reserve Officers' Training Corps is to provide at civil institutions an education which will qualify selected students of such institutions for appointment as officers in the Regular Navy, Naval Reserve, Marine Corps, and Marine Corps Reserve. Upon successful completion of the four-year program, which includes the receipt of a baccalaureate degree from the University, the student may expect to be commissioned and

to be ordered to active duty in ships, submarines or aircraft of the Navy, with field units of the Marine Corps, or with Marine Aviation. In addition, post-graduate education in certain fields and nuclear engineering is available to qualified applicants. See page 407 for details of the program.

### **Air Force Reserve Officers' Training Corps**

The mission of the Air Force ROTC is to develop in selected college students those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the U. S. Air Force. The objectives of the program are to: (1) develop in cadets an understanding of the U. S. Air Force history, mission, organization, operation, problems, and techniques; (2) develop in cadets the ability to work with others on group activities and assume a leadership role when required; and (3) supplement the broad, liberal, education offered at UCLA to prepare cadets for their post-commissioning professional training which in turn will prepare them to discharge the responsibilities required of them as U. S. Air Force officers.

### **ROTC Draft Deferment**

Students who qualify may be deferred from induction into the service under the authority contained in the Universal Military Training and Service Act (65 Stat. 75; 50 U.S.C. app. 451-467) as amended, and as further amended by the Reserve Forces Act of 1955 (P.L. 305, 84th Congress D.A. Bull. 12, 1955).

For military deferment, see the department concerned. Students securing ROTC draft deferments need not request deferment through the Office of Special Services as described below.

## **OFFICE OF SPECIAL SERVICES**

### **Selective Service (Draft)**

Selective Service information and counseling on draft matters are available at the Office of Special Services, A-255 Murphy Hall. Students subject to Selective Service should keep their local boards informed of all situations which might affect their draft classifications.

Verification of enrollment in full-time programs will be submitted to the Selective Service Boards from forms included in the registration packets issued by the Registrar. Students who wish notification sent to their Selective Service Boards are required to fill in these forms and return them with the registration packet. Special Services will confirm the student's program with his Local Board. The official University requirement for minimum progression from one class level to the next is: completion of 40.5 units at the end of the first year; 84 units at the end of the second year; and 135 units at the end of the third year. Unless these minimum requirements are maintained, the Selective Service boards may not grant the 2-S deferment. Students desiring deferment on the basis of enrollment in the University ROTC programs should consult the proper ROTC Department.

## **Veterans Information**

Special Services maintains liaison between certain veterans and veterans' dependents, the Veterans Administration and the State Department of Veterans Affairs to assist students in coordinating University procedures with veterans' educational regulations.

Students wishing to enroll under any available federal educational acts must obtain from the United States Veterans Administration a Certificate for Education and Training which should be filed with the Office of Special Services, Room A-253 Murphy Hall, as soon as possible. These students must be prepared to pay all fees and educational costs at the time of registration, as education and training allowances are paid to the student by the Veterans Administration. The first monthly payments will normally be received 60 days after compliance with the above instructions. All students registered under a veteran's or dependent's subsidy program are required to personally file an official study list in the Office of Special Services for each quarter.

Information regarding educational benefits available for veterans' dependents from the State of California may be obtained from the State Department of Veterans Affairs, P.O. Box 1559, Sacramento, California 95807, or by writing either to 830 North La Brea Avenue, Inglewood, California 90309, or 350 McAllister Street, San Francisco, California 94102. Veterans' dependents who are on the State Program are eligible for fee waivers for the registration fee upon presentation of authorizations from the Division of Educational Assistance.

## **Social Security Benefits for Students**

The full-time status of Social Security dependents from the ages of 18 to 22 is certified to the Social Security Administration by the Office of Special Services. Students who are dependents of retired, deceased, and disabled workers should check their eligibility with the Social Security office nearest their home which will send the certification form directly to the Office of Special Services for completion, so that payments can be made to the student.

## **Vocational Rehabilitation Service**

Students who have a physical, emotional, or other disability which handicaps them vocationally may be eligible for the services of the State Department of Rehabilitation. These services include vocational counseling and guidance, training (with payment of costs such as books, fees, tuition, etc.), and job placement. Under certain circumstances students may also qualify for help with medical needs, living expenses and transportation.

Appointments may be made with a counselor in the Office of Special Services, or by contacting the State Department of Rehabilitation Office at 1494 South Robertson Blvd., Los Angeles 90035; telephone 273-4302.

The Office of Special Services provides assistance in cases of clearly indicated need to physically handicapped students on registration and enrollment procedures and other matters.

## **Work-Study Program**

The Office of Special Services participates in the Work-Study Program, Part 1C of the Economic Opportunity Act of 1964, as it pertains to affiliation with off-campus non-profit agencies.

## **THE ASSOCIATED STUDENTS**

Almost all extracurricular programs or activities for students at UCLA are in some way connected with the Associated Students UCLA. ASUCLA, through its undergraduate and graduate student associations, sponsors dramatic, musical, and cultural programs, social events, community service projects, and student services. The Association operates the Ackerman Union and Kerckhoff Hall, providing students with facilities for meetings, relaxation, a complete student store, and food service areas.

Every UCLA student holds membership in ASUCLA. Undergraduate opinion in the formation of academic, cultural and social policies is represented by the elected members of the Student Legislative Council. The Graduate Students' Association Council is composed of elected representatives from each school or department in the University which has 15 or more graduate students. Both councils sponsor special activities and programs designed to meet the needs and interests of their respective constituencies.

In addition to the Undergraduate Students' Association and the Graduate Students' Association, there are four special governing bodies in ASUCLA: Board of Control, Communications Board, the Student Cultural Commission, and the ASUCLA Film Commission. These boards establish and administer policies regarding ASUCLA finances, facilities, publications, cultural program subsidies, and film programs.

ASUCLA also provides a variety of low-cost services for the convenience of every member of the campus community. These services include a barbershop, cashier, charter flights, ticket agency, print shop, photographic center, post office, and daily newspaper. All ASUCLA activities and services are offered free or at a nominal fee to any UCLA student.

## **UNIVERSITY STUDENT ACTIVITIES OFFICE**

The heterogeneity of the student body at UCLA engenders a broad spectrum of student interests. These interests are expressed in a wide variety of student activities all of which are under the jurisdiction of the University Student Activities Office.

This office has the responsibility of administering University regulations relating to activities of students and registered student organizations. It accomplishes this function by working with the individuals or groups during the ideational development stage, resolving conflicts and maximizing the potential of each activity.

An individual student will generally find an organization to satisfy his interests within the 275 recreation groups, honor societies, religious groups, social clubs, political clubs or fraternal and living groups. He may, however, desire to

participate in student government, merely attend programs ranging from speakers to Mardi Gras, or form his own club.

New ideas for activities are welcomed by and initiated in the Student Activities Office. A philosophy of co-operative programming—involving students, faculty and staff—is prevalent and lends informality to the operation of this office. Students are invited to come in at any time and discuss concepts, plans or problems. Kerckhoff Hall 312.

## **OFFICE OF CULTURAL AND RECREATIONAL AFFAIRS**

The Office of Cultural and Recreational Affairs serves as the administrative center for the coordination of facilities, equipment, programming and supervision of campus recreational activities and services. All students who have paid the full incidental fee are entitled to these services. Four professionally staffed divisions provide a variety of services and programs to accommodate the total campus community.

## **RECREATION SERVICES AND FACILITIES**

Opportunities for informal participation in swimming, body conditioning, basketball, handball, volleyball, badminton, tennis, and field sports are available seven days a week at the two gymnasiums, the Memorial Activities Center, the athletic fields, and tennis courts. In addition, recreation classes are offered in tennis, skiing, volleyball, exercise and figure control, swimming, water safety, senior lifesaving and gymnastics. Further information may be obtained at Pauley Pavilion 164.

## **INTRAMURAL SPORTS**

Organized participation at various skill levels in twenty-four sports is available on an individual, dual, and team basis. The total program includes extramural competition for women, coed activities, as well as the wide range of sports for men and women. The Intramural Office is located in Men's Gymnasium 118.

## **THE UNIVERSITY RECREATION ASSOCIATION**

The University Recreation Association is a federation of thirty-five special interest clubs which features clinics, seminars, exhibitions, concerts, lectures, classes, tournaments, and field trips. The clubs serve students with interests ranging from chess to surfing, and karate to skiing. Inquiries should be directed to Kerckhoff Hall 600.

## **Sunset Canyon Recreation Center**

The Sunset Canyon Recreation Center is a recreational and cultural facility aesthetically designed to serve the University community. It is open all year, seven days a week, for formal and informal use on both an individual and a group basis. Located in the hills of the west campus adjacent to the residence halls, it features two swimming pools (one for children), picnic-barbecue areas, multipurpose play fields, and an outdoor amphitheater. Meeting and lounge rooms are available for conferences, receptions, symposia, dances, catered luncheons and dinners. The Center sponsors programs of poetry readings, in-



formal concerts, exhibitions and art and dance classes for adults and children. An extensive aquatic program includes swim classes for children and adults.

## PHYSICAL EDUCATION

A limited number of regularly scheduled classes are available on the beginning, intermediate and advanced levels in a variety of individual and dual sports, team sports, conditioning activities and social dance. Students may specialize in one area of interest or choose a different activity each quarter.

Regularly scheduled classes are available on the beginning, intermediate and advanced levels in a variety of individual and dual sports, team, conditioning activities and social dance. Students may specialize in one area of interest or choose a different activity each quarter. Participation in this program will enable one to: maintain and improve strength and endurance; reduce tensions and relieve pressures of academic competition; learn new skills for recreational purposes in the university, family and business experiences; practice and perfect skills for more successful intramural participation; improve skill performance in a chosen sport activity. (See SCHEDULE OF CLASSES for complete listing.)

## RELIGIOUS FACILITIES

In the immediate vicinity of the campus, at the southeast corner of Hilgard and Le Conte Avenues, is the University Religious Conference, where official representatives of the Baptist, United Church of Christ, Disciple, Episcopal, Jewish, Latter Day Saints, Lutheran, Methodist and Presbyterian denominations have headquarters or offices from which various campus ministries are carried out. Other available religious facilities exist for Catholic students at the Newman Center, 840 Hilgard Avenue; for Baptists at 666 Levering; and for Lutherans at 10915 Strathmore. The Christian Science Organization reading room and headquarters are located at 560 Hilgard Avenue. The Y.W.C.A. occupies its own building at 574 Hilgard Avenue, near the entrance to the campus.

In these facilities are held religious discussion groups, lectures, Bible classes, social gatherings, luncheons, dinners, social action conferences and other meetings dealing with campus religious life.

## PLACEMENT SERVICES

### PLACEMENT AND CAREER PLANNING CENTER

**Full-Time Career Planning and Placement.** A staff of professional placement representatives is available for consultation about specific career opportunities, planning a job search, as well as more general counsel to assist in the formulation of career directions. This service is available to all regularly enrolled students of the University, their spouses, and alumni.

Included in the service is the Campus Interview Program. Representatives from hundreds of organizations visit the campus each year to interview students of all disciplines and degree levels and to discuss a diversity of employment opportunities with interested students. To participate in this program, contact should be made with the Placement and Career Planning Center preferably a year prior to completion of studies.

In addition, the Center receives numerous listings of full-time career opportunities from many organizations that do not participate in the Campus Interview Program. In the case of such listings, students and alumni are referred directly to the employers' offices.

**Part-Time and Temporary Employment.** Currently enrolled students and their spouses seeking employment during the regular quarters and vacation periods may register with the Center. A job listing and referral service is provided to assist the student in finding suitable employment. Opportunities range from temporary, on call, or part-time jobs during the school year to full-time jobs during quarter-length vacations.

The new student who plans to be self-supporting is advised not to begin his University course without sufficient funds to cover the major portion of at least the first quarter, since it is not always possible to secure employment immediately.

Jobs are usually available on an hourly basis in the fields of typing, stenography, bookkeeping, sales, and clerical work, as well as in unskilled or manual labor categories. Also available for properly qualified students are positions such as recreation assistants, engineering or lab assistants, tutors, and other specialized types of work in research, art, foreign languages, and accounting, among others. Listings of room and board in exchange for work in private homes are also maintained. These are available to men, women, and married couples.

#### **OFFICE OF EDUCATIONAL CAREER SERVICES**

The Office of Educational Career Services is a source of information and counsel to persons from any field of study who are interested in careers in education. The Office refers students and alumni to teaching, administrative and research positions in schools, colleges, industry and government. Services are provided without fee to educational employers as well as matriculated students, former students of regular sessions and graduates of the University of California.

The Office maintains a current file of openings in educational institutions and recommends candidates from among those who have registered for employment services. The University reserves the right not to recommend candidates who seek positions for which they are not fully qualified. Communications should be addressed to the Office of Educational Career Services, 220 Moore Hall.

# Colleges, Schools and Graduate Division

## COLLEGE OF LETTERS AND SCIENCE

The curricula of the College of Letters and Science are designed to provide the student with opportunities to broaden his culture and prepare him for specialized professional studies. These curricula lead to the degree of either Bachelor of Arts or Bachelor of Science, normally at the end of the twelfth quarter.

A liberal education presupposes a reasonably wide distribution of courses that contribute to a desirable balance of intellectual interests. To this end the student is required to select courses in the lower division that deal with general fundamentals of human knowledge. In the more diverse offerings of the upper division the student is relatively free to concentrate his attention upon courses in a field of interest best suited to his aptitudes and purposes.

Each student, therefore, chooses a major which may be a program of related upper division courses within a single department (departmental major), or a group of coordinated courses involving a number of departments (interdepartmental major), or, under certain circumstances, an organized group of courses chosen to meet a student's special need (individual major). The pursuit of such definite courses of study necessarily requires a knowledge of antecedent courses known as "prerequisites." With the assistance of his departmental adviser, the student is expected to select those lower division courses which are related to his proposed advanced study. The College of Letters and Science also maintains a staff of counselors to advise and guide students in all academic matters, especially those students who have not selected a major.

## Honors Program

The College of Letters and Science has instituted an Honors Program which accords special privileges to students who, having demonstrated superior academic achievement, are admitted to College Honors Status. These privileges are designed to offer qualified students educational opportunities not regularly available in the College.

## ADMISSION TO COLLEGE HONORS STATUS

A student in the College who has completed at least four courses on a grade basis, and whose grade-point average for all work undertaken in the University is not less than 3.25, may apply for admission to this program on forms to be supplied by the Office of the Dean.

## PRIVILEGES ACCORDED STUDENTS ADMITTED TO COLLEGE HONORS STATUS

1. Honors students receive special counselling and guidance designed to meet their individual academic needs and interests.

2. Honors students receive stack passes to the University Research Library.
3. Honors students, with the permission of the Dean of Honors Programs, may take as many as six courses in any quarter.
4. Honors students may, with the approval of the Dean of Honors Programs and of the instructor and department concerned, receive credit and grade for regular courses taken by examination only. Such courses may be undertaken in addition to the maximum study-list limits of the College. Applications to take courses on this basis must be obtained from the Office of the Dean of Honors Programs.
5. Students with College Honors Status are usually eligible for admission to the honors programs offered by a number of the departments in the College. Such programs include honors sections of regular courses, honors courses of a seminar type, honors thesis programs, and supplementary and advanced directed study. The departments are responsible for admitting students to their separate honors programs. For details of these programs, the student may consult the Dean of Honors Programs or the department of his major.

### **HONORS WITH THE BACHELOR'S DEGREE**

1. Departmental Honors and Departmental Highest Honors may be awarded at graduation upon the recommendation of the student's major department. The recommendation will be based on successful completion of a departmental honors program by the student. For the requirements of the various departments, consult the department concerned.

2. College Honors will be awarded with the bachelor's degree according to the student's over-all grade-point average at the beginning of his last quarter of academic work, or, if he is not then eligible, at graduation. To be eligible for College Honors, a student must have completed at least 20 courses (80 units) in the University of California. The College Committee on Honors is responsible for awarding College Honors. The degrees of honors and the requirements for each degree are: *Cum laude*, an over-all average of 3.25; *Magna cum laude*, 3.6; *Summa cum laude*, 3.8. Marginal cases will be decided by the Committee on Honors.

3. A list of students who have graduated with College Honors, Departmental Honors, or both, shall be published yearly by the College. Each honors student will be awarded a certificate of honors at graduation indicating both the Departmental Honors and the College Honors which he has won.

### **Requirements for the Bachelor's Degree**

The degree of Bachelor of Arts or Bachelor of Science will be granted upon the following conditions:

1. The minimum number of courses (and units) for the bachelor's degree shall be 45 courses (180 units), of which at least 13 courses (52 units) shall be upper-division courses (courses numbered 100-199). After a student has completed 26 and  $\frac{1}{4}$  courses (105 units) toward the degree, he will be allowed no further unit credit for courses completed at a junior college. Not more than one course (4

units) in Physical Education 1 and 2, and not more than two courses (8 units) in 300 or 400 courses may be counted toward the bachelor's degree. The candidate shall have attained at least a C (2.00) grade-point average in all courses undertaken in this University. A student is not normally expected to take more than 180 units to attain the bachelor's degree. After having credit for 208 units, he will not be permitted to continue, except in rare cases approved by the Dean.

2. The candidate shall have completed the general University and College requirements (see pages 68-70 of this bulletin).

3. The candidate shall have met the University requirement in American History and Institutions.

4. The candidate shall have satisfied the requirements of a major (including preparation for the major) in the College of Letters and Science. Before the degree is granted, the department or committee in charge of the student's major must certify that the student has completed the requirements for the major.

5. Nine courses (36 units) of the final 11 courses (44 units) completed for the bachelor's degree must be earned in residence in the College of Letters and Science on this campus. Not more than five of the nine courses may be completed in summer session on the Los Angeles campus. While registered in this College the student must complete at least six upper division courses (24 units), including four courses (16 units) in the major. This regulation applies to all students, including those entering this University from other institutions or from University of California Extension and those transferring from other colleges of this University. Students transferring from a College of Letters and Science on another campus of the University may petition for an exception to this rule.

Concurrent enrollment in courses offered by University Extension (including correspondence courses) or at other institutions is not permitted except in extraordinary circumstances, and no credit will be given for such courses unless the approval of the Dean has been obtained by petition prior to enrollment.

The degree of Bachelor of Arts shall be granted to all candidates who qualify for the bachelor's degree, except that the degree of Bachelor of Science shall instead be granted to candidates who have completed such majors as the Executive Committee of the College may designate as leading to that degree.

### **General University and College Requirements**

It is advisable that each of the requirements be completed as early as possible in the student's progress toward the degree, normally all of them within the first 24 quarter courses (96 units) of college work. In majors requiring unusually heavy lower division preparation, some postponements may be advisable.

#### **A. Subject A**

All entrants are required to demonstrate proficiency in English composition (Subject A). For further regulations concerning Subject A, see page 40 of this bulletin.

**B. American History and Institutions.** See pages 40-41 of this bulletin.

### **C. Foreign Language**

Five quarter courses in one or two languages or their equivalent. Each year of high-school language (grade C or better) is equivalent to one University course.

A minimum of two courses is required in any language offered in satisfaction of this requirement.

College credit will not be given for work equivalent to that for which credit was given in high school. The first two University courses in a foreign language will be considered a duplication of two years, the first three University courses a duplication of three years, and the first four University courses a duplication of four years of high-school work. No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

Courses in literature in translation given by a foreign-language department will not be accepted in fulfillment of this requirement.

College credit for the mother tongue of a foreign student and for its literature is allowed only for courses taken in native institutions of college grade, or for upper division and graduate courses actually taken at the University of California or at another English-speaking institution of approved standing.

### **D. English Composition**

One course in English composition (English 1) with a grade of C or better. This requirement may also be satisfied with a score of 4 or 5 on the CEEB Advanced Placement Test in English, or by passing a proficiency examination in English composition set and administered by the Department of English. To be eligible for this proficiency examination an entering student must have a score of 700 on the CEEB English Achievement Test with a verbal score of 675 on the CEEB Scholastic Aptitude Test. Transfer students who have completed with grade C or better a college composition course that has not satisfied the College of Letters and Science requirement in English composition may be eligible for the proficiency examination after an interview by the department. Eligible students must register for the examination in the English Department office prior to the day of enrollment in each quarter. A bona fide student from abroad, who has learned English as a foreign language and in whose secondary education English was not the medium of instruction, may satisfy this requirement by completing English 33C with a grade of C or better when that course is required.

### **BREADTH REQUIREMENTS\***

Students who acquired college credit prior to fall 1970 may choose to complete the E-I requirements as described on page 66 of the 1969-70 General Catalog. All other students will be required to complete one of the following alternates, Plan A or Plan B.

\* To meet a breadth requirement a transfer student may offer a 3-unit semester course which parallels a quarter course at UCLA. 1 unit semester courses are not acceptable for application to these requirements. English 1 and courses used to satisfy the Foreign Language requirement may not be used.

For the purposes of these requirements, departmental and interdepartmental majors are classified in the following divisions.

<b>Humanities</b>	Russian	<b>Social Sciences</b>
Ancient Near Eastern Civilizations	Scandinavian Languages	Anthropology
Arabic	Spanish	Business-Economics (for Business Teachers)
Chinese	Speech	Economics
Classics	<b>Physical Sciences</b>	Geography
English	Astronomy	History
French	Chemistry	Latin American Studies
German	Earth Physics and Exploration Geophysics	Political Science
Greek	Geology	Public Service
Hebrew	Mathematics	Social Sciences for Elementary Teachers
Indo-European Studies	Mathematics-Computer Science	Sociology
Italian	Mathematics-Systems Science	<b>Life Sciences</b>
Japanese	Meteorology	Bacteriology
Latin	Physical Sciences-Mathematics	Botany
Linguistics	Physics	Physical Education
Music		Psychology
Near Eastern Studies		Psychology-Mathematics
Philosophy		Zoology
Portuguese		

Each student will choose to satisfy the requirements according to either Plan A or Plan B.

## PLAN A

The student will ordinarily take three courses in each of the three divisions outside the division of his own major. He may, however, elect to use interdisciplinary courses which are authorized by the Academic Senate Council on Educational Development to replace up to three of the total nine courses required. In no case shall the student take less than two courses in each of the three divisions outside the division of his major.

For the purposes of this requirement, all courses offered in the College of Fine Arts, except performance or craft courses, will be considered humanities courses.

Except for the individual courses specified below, courses in the student's major division may not be used to satisfy any of these requirements. In no case may courses in the student's major department or courses required for the major be used to satisfy these requirements. Courses in other divisions required in preparation for the major may be used to satisfy these requirements.

The divisional requirements may be satisfied as follows:

### E. Physical Sciences

Any courses for which the student is eligible in Astronomy, Chemistry, Geology (except Geology 115 and 118), Mathematics, Meteorology, and Physics; also Linguistics 125.

**F. Life Sciences**

Any courses for which the student is eligible in Bacteriology, Biology, Botany, Psychology and Zoology; also Anthropology 11, Geography 5, Geology 115 and 118, and all courses in Physical Education except 1, 2, 119, 121, 136, 139, and 148.

**G. Social Sciences**

Any courses for which the student is eligible in Anthropology (except Anthropology 11), Economics, Geography (except Geography 5), History, Journalism, Political Science, and Sociology; also Physical Education 136, 139, and 148.

**H. Humanities**

Any courses for which the student is eligible in Classics, English, Folklore, French, Germanic Languages, Humanities, Italian, Linguistics, Near Eastern Languages, Oriental Languages, Philosophy, Slavic Languages, Spanish and Portuguese, and Speech.

Acceptable courses in the College of Fine Arts are:

Art 1A-1B-1C, 30A, 100A-100B-100C, 101A-101B-101C, 103B-103C-103D, 104A-104D, 105A-105D, 106A-106B-106C, 108A-108B, 109A-109D, 110A-110D, 111, 112A-112B, 114A-114B-114C, 115A-115B, 116, 118A-118B-118C, 119A-119B-119C, 120A-120B, 121A-121B, 122, 123A-123B.

Dance 140A-140B-140C, 151A-151B.

Integrated Arts 1A-1B-1C.

Music 2A-2B, 13A-13B, 120, 121, 122, 123, 124, 125, 129, 130, 131, 132, 133, 134, 135A-135B-135C, 136, 137, 138, 139, 140A-140B-140C, 141A-141B, 142, 143A-143B, 144, 145, 146, 147, 150A-150B-150C, 154.

Theater Arts 5A-5B-5C, 102A-102B-102D, 104, 105, 106A-106B, 108, 110.

**PLAN B**

The student will take seven courses in any division outside the division of his own major, and either one course in each of the two remaining divisions or two courses in one of the remaining divisions.

For the purposes of this requirement, all courses offered in the College of Fine Arts, except performance or craft courses, will be considered humanities courses. For acceptable courses in the College of Fine Arts, see the list under H in Plan A.

Courses required for the major or preparation for the major may not also be used to satisfy this requirement.

For students electing Plan B, Geology 115 and 118 remain in the Division of Physical Sciences; Physical Education 136, 139, and 148 remain in the Division of Life Sciences; Anthropology 11 and Geography 5 remain in the Division of Social Sciences; and Linguistics 125 remains in the Division of Humanities.



### Credit For Advanced Placement Tests

Students may fulfill a part of the College requirements with credit allowed at the time of admission for College Entrance Examination Board Advanced Placement Tests with scores of 5, 4, or 3. Advanced Placement Test credit will fulfill requirements in the College of Letters and Science as follows:

TEST	CREDIT ALLOWED ON COLLEGE REQUIREMENTS
Biology	Two courses in Life Science.
Chemistry	Two courses in Physical Science.
English	Fulfills the <i>D</i> requirement (Grades 4 and 5 only).
Foreign Language	Fulfills the <i>C</i> requirement.
History—American	Two courses in Social Science.
History—European	Two courses in Social Science.
Mathematics	Two courses in Physical Science.
Physics	Two courses in Physical Science.

Students should be aware that portions of Advanced Placement Test credit may be evaluated by corresponding UCLA course number; e.g. History 7A. If a student takes the equivalent UCLA course, a deduction of unit credit for such duplication will be made prior to graduation.

### Regulations Governing the Major

A major shall consist of not less than nine (36 units), nor more than 15 (60 units) upper division courses, except that a departmental major may be increased by three more upper division courses (12 units) in other departments, with the approval of the Executive Committee of the College.

The majors shall be designated as departmental, interdepartmental, or individual.

A departmental major shall consist of a group of coordinated upper division courses, of which at least six courses are in one department, set up and supervised by a department.

An interdepartmental major shall consist of at least 13 coordinated upper division courses, of which not more than eight are in one department, set up and supervised by a committee appointed by the Executive Committee of the College.

A student who has some unusual but definite academic interest for which no suitable major is offered in the University of California and who has completed at least three quarters of work (a minimum of nine courses) in the University with a grade-point average of B (3.00) or higher may, with the consent of the Dean of the College and with the assistance of a faculty adviser appointed by the Dean, plan his own major. The individual major must be approved by the Executive Committee of the College before it may be accepted in lieu of a departmental or interdepartmental major. The faculty adviser shall supervise the student's work in lieu of a department or committee, and the student's study list must be approved by him before it will be accepted by the Registrar. The Dean must certify that the student has completed the requirements of his major before the degree is granted.

A student who has been away from the University for several terms should consult with his major department concerning the major requirements under which he will graduate.

Each sophomore and upper division student, and each freshman student who has chosen his major, must designate his major on his study-list card; he must declare his major to the Dean of the College; and he shall be advised by a representative of the department or committee before enrolling in classes.

A student in good standing may request to change his major by indicating his intention to the Dean of the College. A student on probation may change his major only with the consent of the Dean of the College. No change of major will be permitted after the opening of the student's last quarter.

Students who fail to attain a grade-point average of at least C (2.00) in work taken in the prerequisites for the major, or in courses in the major, may, at the option of the department or committee in charge, be denied the privilege of entering or of continuing in that major. The student must attain an average grade of C (2.00) in all courses undertaken in the major.

## Organized Majors in the College of Letters and Science

### DEPARTMENTAL MAJORS LEADING TO THE BACHELOR'S DEGREE

The College offers departmental majors in the following fields. These majors lead to the degree of Bachelor of Arts unless otherwise noted.

Ancient Near Eastern Civilizations	French Geography	Music Philosophy
Anthropology	Geology*	Physical Education*
Arabic	German	Physics*
Astronomy	Greek	Political Science
Bacteriology	Hebrew	Portuguese
Botany	History	Psychology
Business-Economics (For Business Teachers)	Indo-European Studies	Russian
Chemistry*	Italian	Scandinavian Languages
Chinese	Japanese	Sociology
Classics	Latin	Spanish
Economics	Linguistics	Speech
English	Mathematics	Zoology
	Meteorology	

### INTERDEPARTMENTAL MAJORS LEADING TO THE BACHELOR'S DEGREE

The College offers interdepartmental majors in the following fields. These majors lead to the degree of Bachelor of Arts unless otherwise noted.

Earth Physics and Exploration Geophysics	Physical Sciences-Mathematics
Latin American Studies	Premedical Studies
Mathematics-Computer Science	Psychology-Mathematics
Mathematics-System Science	Public Service
Near Eastern Studies	Social Sciences for Elementary Teachers

Requirements of these majors are listed in detail on the following pages.

### Special Program in African Studies

*Committee in Charge.* W. E. Welmers (chairman), E. A. Alpers, Mrs. H. Kuper, B. I. Obichere, J. F. Povey.

\* Leading to the degree of Bachelor of Science.

This program is designed primarily for (1) students who plan to live and work in Africa or who are interested in government and public service careers involving African affairs, and (2) students who plan to pursue graduate work in one of the social sciences or Near Eastern and African languages with primary concentration on the African field.

The underlying philosophy of the program in African Studies is that persons with a firm grounding in one of the established disciplines can make the best contribution to an understanding of Africa and its problems. Thus, the special program in African Studies can be taken only jointly with work toward a bachelor's degree in one of the following fields: anthropology, economics, geography, history, Near Eastern and African languages, political science, or sociology. The student completing this special program will receive a degree with a major in his chosen discipline and specialization in African Studies.

*Preparation.* Introductory courses in any four of the five following departments: Anthropology 5A, 5C; Economics 1, 2 or 100; Geography 1A-1B or 101; History 1A-1B-1C; Sociology 1 or 101. Training in Arabic, French, Portuguese, or an African language is highly recommended.

*Upper Division.* The student is required to take a major in a social science, in arts and humanities. In addition to his major he is required to take four courses, in each of four disciplines, which pertain to Africa. He is also required to take African Languages 190 or one quarter of an African language.

### **Special Program in International Relations**

*Adviser.* Undergraduate international relations adviser in the department of Political Science.

This program can only be taken jointly with a major in political science. The student completing this special program will receive a degree with a major in political science and specialization in international relations. The program is designed to serve the needs of: (1) students desiring a general education focused on international affairs; and (2) students preparing for graduate work in international affairs, whether in a social science, in area study, or in a school of foreign service.

The program also partially serves the needs of: (1) students planning careers (in business, law, journalism, or library service) with an international emphasis; and (2) students preparing to teach social science in the secondary schools. These students should govern their programs primarily by the preparation requirements of the professional school or teaching credential of their choice.

*Preparation.* Political Science 1 and 2. History 1A-1B-1C, or any three courses selected from History 8, 9A-9B-9C-9D. Economics 1 and 2, or 100. Sociology 1 or 101. Anthropology 22 or 100. One course selected from Geography 1B, 10A-10B-10C, 101.

*Upper division.* The political science major should be completed as follows: Political Science 110, 120, 121, 141, 150; two additional courses from Group II, International Relations (courses 123 to 139); one course from Group IV, Comparative Government (152 to 169); one course from 115, 146, 188A.

Other social science courses required: Anthropology 125; Economics 180, 190; Geography 140; History 141F-141G, 178A-178B; Sociology 140.

Language requirement: completion of the sixth quarter course (or its equivalent, as prescribed by the language department), with a grade of C or better, of any modern foreign language. French 6, German 6, Spanish 25, Russian 6 or 14, are most frequently offered in fulfillment of this requirement, but see also the offerings listed under Portuguese, Italian, Germanic Languages, Near Eastern and African Languages, and Oriental Languages. Chinese, French, German, Russian and Spanish, are the languages of widest career utility in international affairs.

*Recommended Courses:* Geography 180 through 190; History 125 through 169, 191 through 196; Sociology 120, 126; Economics 110, 111, 112; Anthropology 122, 161, 165.

*Area Focus.* Students are advised but not required to concentrate their political science, geography, history and language courses so as to achieve broad familiarity with one area such as Latin America, Africa, the Atlantic area, the Soviet sphere, East Asia, Southeast Asia, South Asia, or the Middle East.

### Major in Earth Physics and Exploration Geophysics

*Committee in Charge.* R. L. Shreve (chairman), L. Knopoff, G. W. Wetherill.

This major is designed to provide training in the physical sciences which are basic to geophysics. The requirements of companies concerned with geophysical exploration and the demands of educational and research institutions indicate the desirability of a broad training in the physical sciences for those who intend to enter either the field of applied geophysics or the general field of the physics of the earth. Two options are provided below: the first is designed for students with an interest in exploration geophysics; the second is designed as preparation for students intending to undertake graduate study in geophysics, planetary physics, or space sciences.

#### OPTION I. EXPLORATION GEOPHYSICS

*Preparation for the Major.* Chemistry 1A-1B-1C; Geology 4; Mathematics 11A-11B-11C, 12A-12B-12C; Physical Sciences 3G; Physics 7A-7B-7C-7D.

*The Major.* At least 13 courses selected from: (1) required Geology 101A-101B-101C or 111A-111B-111C; Geophysics 136; Physics 105A, 110A, 114, 131, and (2) at least five courses from: Chemistry 110A, 110B, 113; Geology 101A-101B-101C, 111A-111B-111C; Mathematics 130A-130B-130C, 131A-131B, 140A; Physics 105B, 110B, 115A, 116; Planetary and Space Science 101. A summer's experience with a geophysical crew is strongly recommended.

The student must have his program, including electives, approved by his major adviser each quarter.

#### OPTION II. EARTH PHYSICS

*Preparation for the Major.* Chemistry 1A-1B-1C; Mathematics 11A-11B-11C, 12A-12B-12C; Physics 7A-7B-7C-7D.

*The Major.* Physics 105A-105B, 110A-110B, 112A, 114, 115A-115B-115C,

131; Planetary and Space Science 101; and either Mathematics 130A-130B or 131A-131B.

The student must have his program, including electives, approved by his major adviser each quarter.

### Major in Latin American Studies

*Committee in Charge.* C. F. Bennett (chairman), E. Gonzalez, C. L. Hulet, J. M. Lockhart, A. Machado da Rosa, C. W. Meighan.

This major is designed to serve the needs of the following students: (1) those desiring a general education focused on this particular area; and (2) those planning careers which will necessitate residence in or knowledge of Latin America. Selection of courses should be governed in part by the objective of the student.

It is recommended that students who wish to receive credit for work taken in Latin American schools obtain the prior written approval of the Committee.

*Preparation for the Major.* History 8, Portuguese 3, and Spanish 5, 25.

*The Major.* Required: Anthropology 107; Geography 181, 182; History 162A-162B; Political Science 168A-168B; Spanish 121A-121B or Portuguese 121A-121B; *Major Electives:* Five courses with Latin American content chosen from the following list (199 courses must have Latin American content): Anthropology 109, 117, 121, 133A, 133B, 134, 199; Art 118B, 199; Dance 146, 171J, 199; Economics 110, 111, 112, 199; Geography 199; History 163A-163B, 166, 168A-168B, 169, 199; Music 131, 171J, 199; Political Science 131, and when concerned with Latin America, 139, 169, 198, 199; Sociology 131 (same as Anthropology 121), 199; Spanish American Literature 118, 121A-121B (when not counted as part of the major requirement), 137, 139, 143, 149, 151, 160B, 199; Brazilian Literature 101A, 118, 121A-121B (when not counted as part of the major requirement), 131, 133, 199. *Additional Electives:* Four upper division courses to be approved by the curriculum adviser.

### Major in Mathematics-Computer Science

*Committee in Charge.* D. Curtis (Chairman), D. Kantor, D. Martin, J. McLaurin, R. Nilsen.

This major, an alternate to the regular departmental major in Mathematics, consists of an integrated program of courses offered by the Department of Mathematics and the Computer Science Department (School of Engineering and Applied Science). In addition to the appropriate studies in Mathematics, the joint major permits study in the principal disciplines of Computer Science, including theoretical foundations of computer science, methodology of computing, computer system design, programming languages and systems, and computer applications.

*Preparation for the Major.* Mathematics 11A-11B-11C, 12A-12B-12C, Physics 7A-7B-7C or Physics 7A-7B-7D. Engineering 10.

*The Major.* Mathematics 110A, 115, 130A, 152A, and three courses in Mathematics chosen from courses numbered 110 and above. (Recommended: 113, 114, 140A, 140B, 144.) Engineering 100D, 123A, 123B, 125A, 125L, and two courses chosen from Engineering 124A, 125B, 125N, 125P. Credit will not be allowed toward the major for both Mathematics 140B and Engineering 124A.

### Major in Mathematics-System Science

*Committee in Charge.* P. C. Curtis (Chairman), M. Crandall, S. Greibach, T. S. Motzkin, R. Sridhar.

This major is an alternate to the regular departmental major in Mathematics, and combines work in the Department of System Science (School of Engineering and Applied Science) with thorough preparation in mathematics, including those aspects significant in the theory of systems, information, and control. The major is appropriate for students who plan graduate study in mathematics, applied mathematics, or engineering, with emphasis on mathematically based research relevant to such fields as: automata, formal languages, applied logic and the theory of computing; random signals and noise, information theory, coding, communication systems; networks and graphs, state-space theory of systems, feedback and control systems, optimal control theory, computing techniques for system optimization, identification and adaptivity; modeling and analysis of quantitative aspects of systems in other fields, such as biomedical, socio-economic, and civil systems.

*Preparation for the Major.* Mathematics 11A-11B-11C, 12A-12B-12C, and 60 (this course serves as a prerequisite to several upper division Engineering courses: upper division students transferring into the major may substitute an equivalent course with the approval of the committee in charge). Physics 7A-7B-7D. Recommended: Engineering 10 and Physics 7C.

*The Major.* Mathematics 115, 130A, 131A, 132, and two additional Mathematics courses from 110A, 114, 121, 130B, 131B, 150B. Engineering 121C (or 100C or equivalent), 120A, 128A, 128D; one course from Engineering 122A, 128L, 129A; one course from Engineering 120B, 122B, 127B; two additional upper division courses from Mathematics or System Science or related departments as approved by the committee in charge.

### Major in Near Eastern Studies

*Committee in Charge.* A. Tietze (chairman), M. H. Kerr, G. Sabagh, A. K. Sanjian, S. J. Shaw.

This major is designed primarily for the following classes of students: (1) those seeking a general education and desiring a special emphasis in this particular area; and (2) those who plan to live and work in the Near East whose careers will be aided by a knowledge of its peoples, languages, and institutions. Selection of courses should be decided partly by the student's own special objectives except that the same Near Eastern language must be maintained in both lower and upper division.

*Preparation for the Major.* Arabic 1A-1B-1C or, in exceptional cases, the beginning course in Hebrew, Persian or Turkish; candidates must also obtain a reading proficiency in French, German or Italian, and give evidence, normally by examination, of their ability to read current literature on Near Eastern studies (this requirement may be satisfied at any time before graduation); History 1A-1B-1C, 9D; four social science courses from: Anthropology 5A, 5C; Economics 1, 2; Geography 1B, 10C; Sociology 1.

*The Major.* Required courses: Arabic 102A-102B-102C, 103A-103B-103C

and one sequence chosen from: Arabic 130A-130B-130C or 140A-140B-140C (in exceptional cases the equivalent courses in Hebrew, Persian or Turkish may be substituted); History 134A-134B and two courses selected from 135, 136, 138A-138B, 139A-139B-139C, 140A-140B, 209A-209B or 211A-211B-211C; four courses in at least two disciplines selected from: Anthropology 124, 125, 130A-130B, 147; Geography 187, 188; History 117, 123A-123B-123C, 126A-126B, 131A-131B, 133A-133B, 207 or any other history courses listed above; Political Science 132, 164; Sociology 132, 133. **Recommended courses:** Arabic 150A-150B, Hebrew 150A-150B, Persian 150A-150B, Folklore 101; History 111A-111B-111C, 125A-125B-125C; Linguistics 100, 120A-120B; Philosophy 101, 102, 175.

Competency in a second Near Eastern language is suggested for students planning graduate work in Islamic Studies. This work should be undertaken in the senior year.

### **Major in Physical Sciences-Mathematics**

*Committee in Charge.* D. M. Popper (chairman), D. G. Babbitt, M. Chester, M. A. El-Sayed, J. D. McNeil.

This curriculum is being discontinued. Students must complete degree requirements by June, 1973.

This major is designed to provide training in sciences and mathematics for those students who are planning to work for the general secondary credential with physical sciences and general science as a major and mathematics as a minor. The major has been designed to provide adequate training for secondary teachers of physics, chemistry, general science or mathematics.

*Preparation for the Major.* Chemistry 1A-1B-1C, 4A-4B, 6A-6B; Mathematics 11A-11B-11C and 12A-12B or 13A-13B; Physical Sciences 3C, 3M; Physics 7A-7B-7C-7D.

*The Major.* Astronomy 101; Chemistry 110A; Education 130 and either 100 or 108 or 112; Mathematics, three upper division courses, preferably 103A-103B and 106, or 101A-101B and 102A; Physical Sciences 370 (or Mathematics 370); Physics 105A; Physics 121 or Chemistry 113; and three other upper division courses from the physical sciences, life sciences or history (History of Science).

### **Major in Psychology-Mathematics**

*Committee in Charge.* M. P. Friedman (chairman), A. L. Comrey, B. O'Neill, S. Port, M. Seeman.

This major is provided as an alternate to the regular psychology major. It is designed for students planning to go on for graduate work in those fields of psychology where mathematical training is more essential, e.g., measurement, experimental psychology, and theoretical psychology. Present-day trends indicate that mathematical skills are becoming more and more important to the research psychologist.

*Preparation for the Major.* Biology 2, or Biology 1A-1B; Psychology 10 (transfer students and students who change their majors at the beginning of the junior year or later may take Psychology 101 in lieu of Psychology 10 but may not count it toward upper division credit on the major); two courses in

physics and/or chemistry (Physical Sciences 1 and 2 may be used); Mathematics 11A–11B–11C or the equivalent; Mathematics 12A–12B–12C, or the equivalent.

*The Major.* Psychology 110, 115, 120, 125, 135, either 111 (half course) or 121 (half course), and one of 116, 126, or 136 (all half courses); Mathematics 110A, 130A; 150A–150B–150C or 152A–152B and one elective course in mathematics; two elective courses in mathematics and/or psychology.

### **Major in Public Service**

*Committee in Charge.* Ernest A. Engelbert (Chairman), Leland S. Burns, and Jerome Cohen.

This major is a four year program leading to the Bachelor of Arts in Public Service. The major prepares students to work in government, in quasi-governmental agencies and in community organizations related to the public service. This major may also serve as preparation for entry to a variety of graduate and professional programs.

The curriculum is designed to accommodate students who have an interest in public problems and the motivation to acquire the knowledge and skills to deal with those problems. The curriculum combines interdisciplinary course work in the social and behavioral sciences, quantitative methods, seminars on public problems, field internships, and individual and group field research projects. Students may spend up to two quarters off-campus with full academic credit (8 courses).

Students will select a field of specialization from one of the following: Urban and Community Development, National Policy and Administration, International Development Administration, Public Management, Financial Administration, Information Systems, and Human Resources Development.

Each field of specialization has a particular set of requirements and course options. The fields require up to 8 courses of preparation for the major and a minimum of 16 upper division courses in the major. No more than eight upper division courses in any one department, nor more than six Public Service courses, may be credited toward the 16 course requirement.

Students should contact the Public Service Curriculum Office before enrolling in the program.

*Public Service Courses.* Public Service majors are encouraged to develop understanding and expertise in problems of contemporary public relevance, to gain experience in organizations dealing with public problems, to undertake research on public problems, and to participate in seminars integrating on- and off-campus educational experiences related to the program. Accordingly, Public Service majors may take up to 12 courses in the Public Service series 100, 170, 180 and 190. Up to six Public Service courses may be applied to the 16-course requirement in the Major; additional Public Service courses (not to exceed six) will be credited as electives.

### **FIELDS OF SPECIALIZATION**

#### **Urban and Community Development**

*Preparation for the Major.* Economics 1, 2; Mathematics 1 or the equivalent; Math 50 or Sociology 18 and 19; Political Science 1; Psychology 10 (or 101); Sociology 1 (or 101).



*The Major. Required:* 2 courses selected from Anthropology 149 or Sociology 125, Political Science 180 or 182 or 184, Economics 102 or Business Administration 175; Political Science 181 or 190 or Sociology 121; Political Science 115 or Sociology 120; Sociology 124 or 155; Psychology 135.

The remainder of the 16 courses (10 courses) will be selected from Anthropology 149; Business Administration 175, 177, 180, 182, 190A, 190B; Economics 101A, 101B, 102, 109, 120, 121, 122, 130, 133, 150, 151, 152, 170, 173, 175, 178; Geography 150, 152; History 176A, 176B, 180B, 182, 183, 185; Political Science 115, 141, 142, 143, 144, 145, 146, 172A, 172B, 174, 181, 182, 185, 186, 188B, 190, 191; Psychology 125, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 121, 123, 124, 125, 126, 140, 142, 143, 144, 145, 150, 152, 154, 155.

#### **National Policy and Administration**

*Preparation for the Major.* Economics 1, 2; Mathematics 1 or the equivalent; Mathematics 50 or Sociology 18 and 19; Political Science 1; Psychology 10 (or 101); Sociology 1 (or 101).

*The Major—Required.* Economics 102; Political Science 186; any 2 courses from Political Science 141, 142, 143, 144, 145; Political Science 115 or Sociology 120; Political Science 181 or 190 or Sociology 121; Psychology 135.

The remainder of the 16 courses (nine courses) will be selected from Anthropology 167; Business Administration 111, 175, 177, 180, 182, 190A, 190B; Economics 101A, 101B, 108, 109, 110, 111, 112, 120, 130, 160, 170, 173, 175, 178, 180; Geography 134; History 174A, 174B, 176A, 176B, 183, 185; Political Science 115, 141, 142, 143, 144, 145, 172A, 172B, 173, 174, 181, 185, 186, 187, 188B, 190, 191, 192; Psychology 125, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 121, 123, 124, 125, 126, 140, 143, 145, 150, 152, 154, 155.

#### **International Development Administration**

*Preparation for the Major.* Economics 1, 2; Mathematics 1 or the equivalent and Mathematics 2A–2B; Mathematics 50 or Sociology 18 and 19; 6th quarter course in any foreign language or equivalent competence as determined by examination.

*The Major. Required:* Economics 102, 110, 112; Political Science 115 or Sociology 120; Political Science 181 or 190 or Sociology 121; Political Science 188A.

The remainder of the 16 courses (10 courses) will be selected from Anthropology 129, 161, 165, 166; Business Administration 180, 182, 190A, 190B; Economics 101A, 101B, 108, 109, 111, 180, 181, 190, 191, 192; Geography 132, 140; Political Science 115, 150, 161, 162, 164, 165, 166, 168A, 168B, 181, 183, 188B, 190; Psychology 135, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 121, 126, 140, 150, 152, 154, 155.

#### **Public Management**

*Preparation for the Major.* Economics 1, 2; Mathematics 2A–2B–2C; Political Science 1; Psychology 10 (or 101); Sociology 1 (or 101).

*The Major. Required:* Business Administration 113A; one course chosen from Economics 102, 120, 130; Political Science 181; Political Science 190 or Sociology 121; 2 courses chosen from Political Science 141, 142, 143, 144, 145, 180, 186; Political Science 115 or Sociology 120; Psychology 135.

The remainder of the 16 courses (eight courses) will be selected from Anthropology 167; Business Administration 111, 115A, 116A, 180, 182, 190A, 190B; Economics 101A, 101B, 102, 108, 109, 112, 120, 121, 130, 133, 150, 152, 170, 173, 175, 178; History 174A, 174B, 176A, 176B, 183, 185; Political Science 115, 141, 142, 143, 144, 145, 146, 172A, 172B, 173, 174, 180 or 182 or 184, 185, 186, 187, 190, 191, 192; Psychology 125, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 123, 124, 125, 126, 140, 143, 145, 150, 152, 154, 155.

#### **Financial Administration**

*Preparation for the Major.* Business Administration 1A–1B; Economics 1, 2; Mathematics 2A–2B–2C; Political Science 1.

*The Major. Required:* Business Administration 113A and 120; Economics 130, 133; Political Science 181 or 190; two courses chosen from Political Science 141, 142, 143, 144, 180 or 186.

The remainder of the 16 courses (nine courses) will be selected from Business Administration 111, 113B, 115A, 116A, 130, 180, 182, 190A, 190B; Economics 101A, 101B, 102, 109, 120, 121, 132, 160, 161, 162, 192; Political Science 115, 141, 142, 143, 144, 172A, 172B, 180 or 182 or 184, 185, 186, 187, 190, 191; Psychology 125, 135, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 123, 124, 125, 126, 140, 143, 150, 152, 154, 155.

#### **Information Systems**

*Preparation for the Major.* Economics 1, 2; Mathematics 3A–3B–3C or 11A–11B–11C, 12A; Political Science 1; Psychology 10 (or 101) or Sociology 1 (or 101). Recommended: Mathematics 12B–12C.

*The Major. Required:* Engineering 100D; Business Administration 111, 113A, 115A, 116A; one course selected from Economics 102, 120, 130; one course selected from Political Science 181 or 190 or Sociology 121.

The remainder of the 16 courses (nine courses) will be selected from Business Administration 113B, 115D, 115E, 116B, 140, 180, 182, 190A, 190B; Economics 101A, 101B, 102, 108, 111, 120, 130, 133, 145, 146, 147; Mathematics 130A, 144; Political Science 115, 141, 142, 143, 144, 145, 146, 180 or 182 or 184, 185, 186, 190, 191, 192; Psychology 125, 135, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 121, 122, 123, 124, 125, 126, 140, 143, 150, 152, 154, 155.

#### **Human Resources Development**

*Preparation for the Major.* Economics 1, 2; Mathematics 1 or the equivalent; Mathematics 50 or Sociology 18 and 19; Psychology 10 (or 101); Sociology 1 (or 101); Anthropology 5A or 22 or Political Science 1.

*The Major. Required:* Anthropology 161 or 165 or 166; Economics 102, 108; Psychology 135; Political Science 181 or 190 or Sociology 121; Political Science 115 or Sociology 120.

The remainder of the 16 courses (ten courses) will be selected from Anthropology 129, 149, 161, 165, 166, 167; Business Administration 175, 177, 180, 182, 190A, 190B; Economics 101A, 101B, 109, 110, 111, 112, 120, 121, 150, 151, 152, 180; Geography 122; History 176A, 176B, 183, 185; Political Science 115, 141, 142, 144, 172B, 174, 181, 185, 186, 190; Psychology 125, 127, 130, 133A, 133B, 133C, 134, 137A, 137B, 148, 149, 189; Public Service 100, 170, 180, 190; Sociology 113, 120, 121, 123, 124, 125, 126, 140, 142, 143, 144, 145, 150, 152, 154, 155.

### Major in Social Sciences for Elementary Teachers

*Committee in Charge.* J. E. Phillips (chairman), W. H. Dutton, E. A. Engelbert, B. E. Thomas, R. A. Wilson.

This major has been designed in accordance with the State law governing the elementary teaching credential. The program, which must be completed in its entirety for the bachelor's degree, consists of a social science major, an Allied Field in English, and a professional sequence in education. A fifth year is necessary for the completion of the credential requirements. An alternate program is the departmental major. For further information concerning credential programs see the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

Students entering any elementary teaching program must maintain a grade-point average of C (2.00) in all courses taken at the University; of C (2.00) in all courses in the major; of C (2.00) in all courses in the Allied Field; of C (2.00) in all courses in Education; and at least a grade of C in Education 324A-324B. These are the minimum requirements for the bachelor's degree. At least a 2.25 average is necessary to enter the fifth-year certificate program and at least a B (3.00) average is necessary to enter all master's programs.

All petitions regarding exceptions to any of the requirements in this program must be submitted to the College of Letters and Science office.

*Preparation for the Major.* Required of all students: Mathematics 38; Music 1 or 2A; Psychology 10 and 12; History 1A-1B-1C; Geography 1A-1B or 101; English 1, 2, 10A-10B-10C.

*The Major.* The major consists of 11 upper division courses distributed as follows: (1) three courses from History 121A, 121B, 141A-141B, 141G, 162A-162B, 166, 176A-176B, 177A-177B, 178A, 178B, 179A, 179B, 180A-180B, 181, 188; (2) four courses from Geography 110, 120, 122, 124, 130, 132, 134, 140, 150, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191; (3) two courses in two of the following departments: (a) *Anthropology*: two courses from the following: 100, 102, 105, 106, 107, 110, 124, 125, 127, 130A-130B, 167; (b) *Economics*: two courses from the following: 100, 105, 107, 108, 110, 111, 120, 130, 178, 180, 181, 190; (c) *Political Science*: two courses from the following: 112, 113, 114, 115, 120, 121, 123, 141, 142, 143, 144, 145, 171, 173, 174, 180, 181, 182, 186; (d) *Psychology*: two courses from the following: 110, 122, 125, 130, 132A-132B, 135; (e) *Sociology*: two courses from the following: 101, 120, 121, 122, 123, 124, 125, 130, 132, 133, 141, 142, 145, 146, 150, 151, 152, 153, 154, 155.

*The Allied Field.* The allied field in English consists of 3 upper division English courses, including two chosen from the following: 102, 103, 104, 110, 111, 112, 113, 115, 116, 117, 142A-142B, 157, 164, 165, 170, 171, 172, 173 and 174.

**Education Professional Sequence.** The following courses in Education are required: 100, 112, 124A–124B–124C, 324A and 324B.

Students in this curriculum are advised to follow the Plan A Breadth requirements. All courses required for preparation for the major (except History and Geography) will apply to this Plan only.

**Recommended electives:** Art 1A–1B–1C, 10A; Public Health 44, 131; Physical Education 121.

**Departmental Major Program.** In place of the major in Social Sciences for Elementary Teachers one may elect a departmental major. If a teaching minor is desired, see the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION for information.

## Preparation for Various Professional Curricula

In addition to the majors described in the preceding pages, all of which lead to the bachelor's degree, certain courses given at UCLA may be used as preparation for admission to the professional colleges and schools of the University in Los Angeles, Berkeley and San Francisco.

### Precriminology Curricula: Two Years

The School of Criminology (Berkeley) offers a broad range of studies in the nature, causes, and prevention of crime. The School's program falls into two main areas of emphasis: the first, general criminology, draws upon the concepts and methods of the social and behavioral sciences for an understanding of the economic, political, psychological, and sociological factors behind crime; the second, criminalistics, is concerned with the application of the natural sciences to law enforcement and crime investigation. The first program leads to a Bachelor of Arts degree; the second, to a Bachelor of Science degree. Students in either program are expected to gain an acquaintance with both fields.

Students are admitted in the junior year, after the completion of a 90-unit lower division precriminology curriculum with a grade-point average of 2.0 or better. The curriculum normally consists of the following subjects.

**Basic Program (all students).** English 1, 2; Foreign Language (modern), equivalent of course 3; Psychology 10; Sociology 1 and another sociology course.

**Criminology (Social Science Emphasis).** Mathematics 50 or Psychology 41 and Psychology 142; Political Science 1 and 2 or an upper division course in the American field; Psychology 70, or 125 or 130; four courses in natural science including at least one of the following: Biology 1A, 1B, 2; Humanities, four courses.

**Criminalistics (Natural Science Emphasis).** Biology 2; Chemistry 1A–1B–1C, 4A–4B, 6A–6B; Mathematics 3A or 11A; Physics 2A–2B–2C; Psychology 10; Humanities courses, 5 units. (Statistics 20 will be taken at Berkeley.)

In addition to the requirements listed above the student must complete the breadth requirements of the College of Letters and Science of either UCLA or UCB. In meeting the UCLA breadth requirements, the Criminology major is considered to be in the Social Science division and the Criminalistics major in either Life Sciences or Physical Sciences.

For further information regarding these programs, the student should correspond with the School of Criminology, University of California, Berkeley.

### **Predental Curriculum: Three Years**

*Adviser for Applicants to Dental Schools.* Nancy Laurie, School of Dentistry.

The College of Letters and Science offers a predental curriculum designed to fulfill the basic educational requirements for admission to several dental schools and the general educational requirements of the College of Letters and Science. It is advised that the student determine and satisfy the specific requirements of the dental schools to which he expects to apply.\*

The student will find himself more adequately prepared for the predental curriculum if he has taken the following subjects in high school: English, history, mathematics (algebra, geometry and trigonometry), chemistry, physics and foreign language.

The 135 quarter units of work required for admission to the School of Dentistry include the following:

General University Requirements: (1) Subject A; (2) American History and Institutions.

Specific UCLA School of Dentistry Requirements† (1) English 1 and 2; (2) Sciences: Chemistry 1A-1B-1C, 4A-4B, 6A-6B; Physics 2A-2B-2C; Biology 1A-1B; Zoology 115 and Psychology 10.

Social sciences and humanities should also be included in the 135 quarter units for which the student may consider such courses as anthropology, history, economics, psychology, political science, appreciation of art and/or music, and philosophy.

### **Predental Hygiene Curriculum: Two Years§**

*Adviser.* Information may be obtained at the office of the College of Letters and Science.

The University offers a four-year program in dental hygiene leading to the degree of Bachelor of Science. The first two years may be taken at Los Angeles; the last two years must be taken in the School of Dentistry in San Francisco.

The 90 quarter units of work required for admission to the School of Dentistry include general University requirements and additional specific requirements, as follows (the numbers in parentheses refer to courses at the University of California, Los Angeles, which fulfill the requirements):

*Curriculum Requirements.* (1) Subject A; (2) American History and Institutions (The examination in American History and Institutions may be taken in the School of Dentistry, but it is preferable to satisfy the requirements in the predental program.); (3) English 1, 2; (4) Chemistry 1A-1B-1C, 4A-4B, 6A-6B (five courses); (5) Biology 1A-1B; (6) Psychology 10, and one additional course; (7) Electives: Courses in Social Sciences and humanities (including foreign language).

\* School of Dentistry, page 111.

† Other dental schools may have different requirements.

§ The School of Dentistry reserves the right to limit enrollment if applications exceed the available facilities, and to require interviews and aptitude tests if they are necessary in the selection of the class. For further information see the ANNOUNCEMENT OF THE SCHOOL OF DENTISTRY, SAN FRANCISCO.

**Preengineering Curriculum: Two Years**

*Program Adviser.* W. J. Knapp and staff. Appointments may be made at 6412 Boelter Hall.

Students may transfer to the School of Engineering and Applied Science at the upper division level from a variety of majors. A Pre-Engineering Curriculum has been planned to assist students who envision an engineering major early in their college years.

UCLA offers a three-part 5-year program in engineering leading to the degree of Master of Science. The first part of the program, the Pre-Engineering Curriculum, is given at the University of California in the College of Letters and Science. Parts II and III of the program, the upper division and graduate years, are given in the School of Engineering and Applied Science.

Three courses in chemistry, six courses in mathematics, and four courses in physics constitute the minimum requirements for acceptance to the School (see pages 125–126). In addition of this minimal preparation students undertaking the Pre-Engineering Curriculum are advised to include one course each in English composition, computer science, and life science. If taken elsewhere, the courses selected to meet the *minimum requirements must be equivalent to those offered at the University of California for physical science majors.*

Students who are enrolled in the Pre-Engineering Program in the College of Letters and Science will take the following courses:

Mathematics 11A–11B–11C, 12A–12B–12C

Physics 7A–7B–7C–7D

Chemistry 1A–1B–1C

English I (with grade of C or better)

Engineering 10

1 course in the Life Sciences

4 courses in the Humanities, Social Sciences, and Fine Arts

3 courses of free electives

In selecting courses to meet the above requirements in the Life Sciences, Humanities, Social Sciences, and Fine Arts, students are advised to choose courses listed under the breadth requirements of the College of Letters and Science. Science.

Further information concerning the program of the School of Engineering and Applied Science leading to the degree of Master of Science may be found on page 135.

**Premedical Studies: Four Years‡**

*Program Adviser.* See major department.

Premedical Advisory Office. 1312 Murphy Hall.

Students who intend to apply for admission to a medical school and who wish to complete the requirements for a bachelor's degree before such admission should select a major within the College. In addition to fulfilling the requirements of the chosen major, the student is advised to ascertain and satisfy the specific requirements for medical schools to which he expects to apply.

**Premedical Curriculum: Three Years†**

Premedical Advisory Office. 1312 Murphy Hall.

It is assumed that as preparation for this curriculum the student will have completed in high school the following subjects: English, three units; United States history, one unit; mathematics, two units; chemistry, one unit; physics, one unit; foreign language (preferably French or German), two units. It is desirable that a course in freehand drawing be taken in high school. If possible, the student should also complete in high school intermediate algebra,  $\frac{1}{2}$  unit, and trigonometry,  $\frac{1}{2}$  unit, because these courses cannot be taken in the University.

Students who fulfill the following curriculum requirements in the College of Letters and Science at Los Angeles and who are then admitted to the School of Medicine at Los Angeles without the bachelor's degree may, by petition, upon satisfactory completion of the first year medical curriculum, be eligible for award of the degree Bachelor of Science in Premedical Studies by the College of Letters and Science. Only students who have taken all of their course work at Los Angeles are eligible for this degree. *Undergraduate Curriculum Requirements:* A total of not less than 34 courses including: American History and Institutions; English 1; Foreign Languages, five courses; Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Physics 2A-2B-2C; Mathematics 3A-3B-3C; Social Sciences,\* three courses; Humanities,\* three courses; Biology 1A-1B; Zoology 107 and 115; Electives, five courses. Additional electives may be substituted for the requirements in American History and Institutions and in English 1 where these are met by examination and for any portion of the foreign language requirement satisfied by high school credits. This curriculum, if the student is not admitted to medical school, will ordinarily permit completion of a major during three additional quarters in a number of departments of the College of Letters and Science.

It is important for students to bear in mind that the class entering the School of Medicine is limited; in the past there have been a great many more applicants than could be admitted. Premedical students who, upon the conclusion of their ninth quarter, find themselves thus excluded from the School of Medicine, will be unable to obtain the bachelor's degree in the College of Letters and Science at the end of the twelfth quarter, unless they plan their programs with this contingency in mind. They should, therefore, either enter a departmental major at the beginning of the seventh quarter, at the same time meeting all premedical requirements, or include in their premedical program a sufficient number of appropriate courses in some major department. Provision for the completion of such a major does not prejudice the student's eligibility for admission to the School of Medicine.

† Usually the following courses are required for admission to medical school: English 1, 2; Chemistry 1A-1B-1C, 4A-4B, 6A-6B (Chemistry 4C, 6C recommended); Physics 2A-2B-2C; Biology 1A-1B; Zoology 107, 115. (San Francisco requires 12 units of modern foreign language).

\* These courses should satisfy the Breadth requirements as indicated on page 70 of this catalog.

**Prenursing Curriculum: Two Years**

*Committee in Charge.* J. Auger (chairman), E. DeSantis, G. J. Jann, M. Muecke.

The University offers a four-year course leading to the Bachelor of Science degree in nursing. The prenursing curriculum in the lower division of the College of Letters and Science is designed to prepare students for the upper division program in the School of Nursing. The curriculum as set forth below includes the specific requirements for acceptance by the School of Nursing.

Students should apply for admission to the School of Nursing when they have completed or have in progress 90 quarter units of the prenursing curriculum with at least a grade C (2.00) average.

*Curriculum Requirements.* (1) Subject A; (2) American History and Institutions; (3) Foreign language (completion of course 4, or four years of one language in high school); (4) Elementary algebra and plane geometry; (5) English 1; (6) Physical sciences: Chemistry 1A–1N; Physical Sciences 1 (or a high school course in physics with laboratory); (7) Life sciences: Bacteriology 100A; Biology 1A–1B; Psychology 12; (8) Social sciences: Anthropology 22 or 5A; Psychology 10; Sociology 1 or 101; (9) Humanities: three courses.

**Preoptometry Curriculum: Two Years**

*Adviser:* Frederick Crescitelli, Department of Zoology.

A two-year program designed to prepare students for admission to optometric schools may be completed in the College of Letters and Science. Students planning to transfer to the School of Optometry at Berkeley are advised to contact the Dean of the School of Optometry, University of California, Berkeley, California 94720 as early in their preprofessional studies as possible.

The student will be adequately prepared for preoptometric studies if he has taken the following subjects in high school: English, history, mathematics (algebra, geometry and trigonometry), chemistry, physics and foreign language.

The 90 quarter units of work required for admission to the School of Optometry, Berkeley, include the following:

General University Requirements—(1) Subject A, (2) American History and Institutions.

Specific UCB School of Optometry Requirements—(1) English 1 and 2; (2) Chemistry 1A–1B–1C, 4A–4B, 6A–6B; (3) Physics 2A–2B–2C; (4) Biology 1A–1B; Psychology 10; (5) Mathematics 3A–3B–3C or Mathematics 11A–11B–11C.

The balance of the 90 quarter units required for admission may be selected from the social sciences, foreign languages and the humanities.

**Prepharmacy Curriculum: Two Years**

*Adviser.* J. H. Beckerman. Appointments may be made at A4-205, Center for the Health Sciences.

The School of Pharmacy on the San Francisco campus of the University offers a four-year curriculum leading to the degree of Doctor of Pharmacy. To be



admitted to this curriculum a student must have met all requirements for admission to the University and have completed, with an average grade of C (2.00) or better in the University of California or in another institution of approved standing, at least 90 quarter units of the program set forth below. Students taking the prepharmacy work at the University of California normally will be enrolled in the College of Letters and Science. If taken elsewhere, the courses selected must be equivalent to those offered at the University of California. In order to complete prepharmacy studies in the minimum of time, students should complete elementary chemistry, trigonometry, and a full year of intermediate algebra in high school. §

*Curriculum Requirements: First Year.* (1) Subject A; (2) English 1, 2; (3) Chemistry 1A-1B-1C; (4) Trigonometry and intermediate algebra (if not completed in high school); (5) Electives: six or seven elective courses should be selected from courses in foreign language, social sciences, and humanities offered in satisfaction of the lower division requirements of the College.

*Curriculum Requirements: Second Year.* (1) Biology 1A-1B; (2) Physics 2A-2B-2C; (3) Mathematics 3A-3B-3C; (4) American History and Institutions; (5) Electives, two-three.

### **Prephysical Therapy Curriculum: Three or Four Years**

*Program Adviser.* Gerald W. Gardner, Department of Physical Education.

*Adviser for Applicants to Physical Therapy Schools.* Bernard Strohm, Division of Rehabilitation.

Students who intend to apply for admission to a Physical Therapy School on completion of their Junior year are advised to ascertain and satisfy the specific requirements for the schools to which they expect to apply. Students who wish to complete the requirements for a bachelor's degree before applying for admission to a school of physical therapy should select a major within the College as well as ascertain and satisfy specific requirements for the physical therapy schools to which they expect to apply.

Students intending to transfer to the University of California, San Francisco Medical Center should satisfy the following specific requirements if they intend to receive both the Certificate of Completion in Physical Therapy and the Bachelor of Science degree: 135 quarter units of college work including 8 units of inorganic chemistry, 4 units of physics, 4 units of human anatomy, 6 units of physiology with laboratory, 5 units of abnormal psychology as well as satisfy the College of Letters and Science requirements.

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§ Students who have completed the two-year prepharmacy curriculum at Los Angeles cannot be assured of admission to the School of Pharmacy of the San Francisco campus. When the number of qualified applicants for the Doctor of Pharmacy curriculum exceeds the available facilities, selection will be made on the basis of scholarship as determined from the College record. A personal interview may be required. Applications for admission to the School of Pharmacy, San Francisco campus, must be filed between October 1 and February 1 preceding the September of proposed admission. Blanks may be obtained from the Office of the Director of Admissions, University of California Medical Center, San Francisco 94122. For further information see the ANNOUNCEMENT OF THE SCHOOL OF PHARMACY, SAN FRANCISCO, which may be obtained from the Dean, School of Pharmacy, University of California Medical Center, San Francisco 94122.

## Other Professional Curricula in the University

### JOURNALISM

The University offers no undergraduate major in journalism at Los Angeles. There is, however, an undergraduate program in journalism which is designed primarily to prepare the student for graduate training leading to a career in journalism either on a newspaper or magazine, in broadcasting, or in the communicative aspects of public information.

Undergraduate preparation for journalism embraces three areas: (1) general requirements of the College of Letters and Science, (2) a major in one of the social sciences or humanities disciplines, and (3) a series of undergraduate courses in journalism to be taken as a group of related electives in the junior and senior years.

Undergraduate students interested in journalism should select a major from the list of majors. The department recommends the following: economics, English, history, political science and sociology. Other majors also are suitable, and the student may wish to consult the department before making a selection. On the undergraduate Application for Admission, the student should indicate the college, the major, and the word "journalism" in parentheses, e.g., *Letters and Science, Political Science (Journalism)*. This will permit the College to assign the student to the proper adviser who will help the student plan a program in his major with electives recommended by the Department of Journalism.

### LIBRARY SERVICE

The University of California does not offer an undergraduate major in librarianship. The School of Library Service on the Los Angeles campus and the School of Librarianship on the Berkeley campus have the following basic admission requirements: a bachelor's degree with a subject major, a broad background in the liberal arts and sciences, and a reading knowledge of at least two modern foreign languages. Librarians interested in documentation will also need a background in mathematics. Further information on admission requirements and on recommended undergraduate courses may be obtained from the Office of the School of Library Service, Powell Library 326.

Undergraduate students in the University who are primarily interested in entering a graduate library school should select a major from the list of majors. This major and the appropriate college should be indicated on the undergraduate Application for Admission, with Library Service in parentheses: e.g., *Letters and Science, English (Library Service)*. This will make it possible for the College to assign the student to the proper adviser who will help the student plan a program in his selected major with electives recommended by the School of Library Service. This procedure will also assure that the admission requirements, such as a reading knowledge of two modern foreign languages, of the School of Library Service are known to the student. Neither library service nor librarianship should be listed as a major.

**RELIGION**

*Advisory Committee.* K. W. Bolle (chairman), E. Ashikaga, A. Funkenstein, P. E. Hocking, C. W. Savage.

The University does not have a department of religion. But it does offer a number of programs for students interested in the study of religion.

*History of Religions.* A student who wants to concentrate on the History of Religions is urged to contact the committee early in his college years. An adviser will guide his program. A large variety of programs is possible, but in general a minimum of two years (six quarters) of study of a classical or ancient language is required in addition to a number of courses in History and other departments. In most cases, the student thus concentrating on the study of religion will be a History major, except that a larger number of courses will be more systematically arranged. In all cases the program will include History 124A (Introduction to the History of Religions) and at least two courses offered in the University and dealing with specific religious traditions. The program is open to students working toward a bachelor's degree as a terminal degree as well as to students who want to prepare for graduate work in the History of Religions.

*Other programs.* In addition the University offers several more or less specialized undergraduate programs of study dealing with religion. Students interested in the religions of tribal or non-literate peoples are referred to the requirements of the Anthropology Department (page 157). This interested in the religions of the Ancient Near East and in Islam are referred to the requirements for the interdepartmental major in Near Eastern Studies (page 328). See also under Art, History, Oriental Languages, Philosophy, Sociology, and Folklore.

*Pre-rabbinical and pre-ministerial study.* Students preparing for admission to a theological seminary may either follow a major and electives recommended by the American Association of Theological Schools or specific Protestant, Catholic or Jewish seminaries, or upon request be assigned an adviser and follow a program of study as indicated above under History of Religions.

The attention of students interested in religion is directed to the following specific courses: Anthropology 124 (Comparative Religion); Arabic 150A–150B (Survey of Arabic Literature in English); Art 105A (Early Christian and Byzantine Art); Classics 161 (Introduction to Classical Mythology); English 113 (The English Bible as Literature); Hebrew 120A–120B–120C–120D–120E–120F (Biblical Texts), Hebrew 150A–150B (Survey of Hebrew Literature in English); History 121A (The Early Middle Ages), History of 121B (The Later Middle Ages), History 124A–124B (History of Religions), History 131A–131B (Armenian History), History 135 (Introduction to Islamic Culture), History 138A–138B (Jewish History), History 141B (The Reformation), History 177A–177B (Intellectual History of the United States); History 196A (Early History of India), History 204A–204B (History of the Church in the Middle Ages), History 207 (Armenian Intellectual History); Italian 113A–113B–113C (Dante's "Divina Commedia"); Music 120 (Music in the Middle Ages); Music 139 (History and Literature of Church Music); Oriental Languages 172A–172B–172C (The Influence of Buddhism on Far Eastern Cultures and European Thought); Persian 150A–150B (Survey of Persian Literature in English); Philosophy 103 (Medieval

Philosophy from Augustine to Aquinas), Philosophy 104 (Late Medieval and Renaissance Philosophy), Philosophy 150 (Society and Morals), Philosophy 151 (History of Ethics), Philosophy 175 (Philosophy of Religion); Semitics 130 (Biblical Aramaic).

## THE COLLEGE OF FINE ARTS

The College of Fine Arts, established on the Los Angeles campus in 1960 to administer the curricula in the arts, presently houses the departments of Art, Dance, Music, and Theater Arts. Located in Los Angeles, one of the nation's greatest and most rapidly growing centers of vitality in the fine arts, the College has the opportunity to take fullest advantage of this vitality and, at the same time, the obligation to nurture the continued growth and development of the fine arts in California generally and southern California in particular.

Combining scholarly study with creativity and performance, the College of Fine Arts believes that for serious students, high competence in the arts can effectively be developed at the university level. The objective, therefore, is a truly professional education of the highest quality for the creative and performing artist on the one hand, and the historian and critic of the arts on the other. By completing additional requirements as determined by the Graduate School of Education and the State Department of Education, students may also qualify for standard teaching credentials (see the ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION).

## Requirements for the Bachelor's Degree

### UNIT REQUIREMENTS

The minimum number of courses (and units) for the bachelor's degree is 45 courses (180 units), of which at least 24 courses (96 units) are to be outside the student's major department. At least 16 courses (64 units) must be in upper division courses, including two courses (8 units) outside the major department.

*The Study List.* Each quarter the student study list may include from twelve to sixteen units (3 to 4 courses). Petitions for less than twelve units or more than sixteen units must be filed and approved by the Dean of the College prior to the deadline dates listed in the annual "Announcement of the College of Fine Arts."

Courses numbered in the 200 series are normally reserved for graduate students only. Undergraduate students who wish to take these courses must petition for advance approval of the department chairman and the Dean of the College, prior to the deadline dates referred to above. Courses numbered in the 400 and 500 series are not available to undergraduate students in the College of Fine Arts.

### SCHOLARSHIP REQUIREMENTS

A C average (2.0) is required on all work attempted in the University of California, exclusive of courses in University Extension and courses attempted on a pass/fail basis. A C average is also required in all upper division courses in the major attempted in the University.

## RESIDENCE REQUIREMENTS

Of the last 45 units completed for the bachelor's degree, 35 must be earned in the College of Fine Arts. Not more than 18 of these 35 units may be completed in summer sessions at UCLA.

For students transferring from another institution with senior standing, there is the additional requirement that, of the 35 units to be earned in residence in the College of Fine Arts, 28 must be *upper division*, including 16 upper division units in the major department. This paragraph does not apply to students transferring from other colleges within the University.

*University Extension.* Courses in University of California Extension (either class or correspondence) may not be offered as part of the residence requirement.

*Junior College.* Courses taken at a junior college after the completion of 70 semester units (105 quarter units) toward the degree may satisfy lower division subject requirements, but they are not given unit credit toward the total units required for graduation. Junior college credits may not apply on any upper division requirement.

*Concurrent Enrollment.* Concurrent enrollment in courses at another institution or in University Extension (including correspondence courses) is permitted only in extraordinary circumstances, and no credit is given for such courses unless the approval of the Dean has been obtained by petition *prior to enrollment*.

## SUBJECT REQUIREMENTS

All students complete the specific subject requirements established by the University, the College of Fine Arts, and the student's major department.

### General University Requirements

*Subject A* (English Composition). See page 40.

*American History and Institutions.* See pages 40–41.

### General College Requirements

The general requirements of the College of Fine Arts provide for breadth in the student's education, and are planned to insure a degree of basic skill in communication—both in English and in one foreign language, and to offer the student an introduction to each of the broad fields of human learning: natural science, social science, and the humanities. It is intended that these requirements may be spread over the entire undergraduate program, and students are encouraged to take both lower and upper division courses for the completion of these requirements.

## ENGLISH COMPOSITION

One course in English composition (English 1) with a grade of "C" or better, taken at UCLA or transferred from another institution, is required of all students. This course may *not* be taken for a Pass/Not Pass grade. Individual departments may require additional evidence of writing ability (English 2 or the equivalent) as part of the preparation for the major.

This requirement may also be met by a score of 4 or 5 in the College Entrance Examination Board's Advanced Placement Test in English, or by passing a proficiency examination in English composition set and administered by the Department of English. To be eligible for this proficiency examination an entering student must have a score of 700 on the CEEB English Achievement Test with a verbal score of 675 on the CEEB Scholastic Aptitude Test, or must have the endorsement of his major department based on evidence of superior writing ability in a departmental course. Transfer students who have completed with a grade of "C" or better a college composition course not evaluated as English 1, may request permission from the English Department to take this proficiency examination. Eligible students must register for the examination in the English Department office prior to the day of enrollment in any quarter.

A foreign student whose entire secondary school work was completed in his native tongue, excluding English, may satisfy this requirement with English 33C if completed with a grade of "C" or better.

#### **FOREIGN LANGUAGE, NATURAL SCIENCE, SOCIAL SCIENCE AND HUMANITIES**

Thirteen courses (52 units) chosen from these four areas, including at least three courses (12 units) in one foreign language, and at least three courses (12 units) in each of two other areas. *Any course applied on one of these four general requirements may not also be applied on another of these requirements.*

##### **Foreign Language**

At least three courses in one foreign language are required of all students. All courses in foreign language, except foreign literature in English translation, may be applied to this requirement.

Without reducing the total number of units required for the bachelor's degree, high school foreign language work with grades of "C" or better and not duplicated by college work will count as follows: the first two years together equal two college courses, and the third and fourth years each equal one college course. No more than the equivalent of three college foreign language courses taken at the high school level will count toward the required thirteen courses.

A foreign student whose entire secondary school work was completed in his native tongue, excluding English, may *upon petition* be considered as having fulfilled the foreign language requirement.

##### **Natural Science**

Courses from any of the physical and biological sciences will meet this requirement. Also, Anthropology 1A, 1B, or 11; Geography 1A; History 106A, 106B, 106C, 106D; Medical History 107B; Physical Education 111A, 111B; and Psychology 12.

##### **Social Science**

Students may select courses to meet this requirement from the following: all courses in anthropology, economics, geography, history, political science, psychology, and sociology. Any course taken to satisfy the University requirement in American History and Institutions may also be applied on this requirement.

**Humanities**

Courses to meet this requirement may be selected from the following areas:

*The Arts:* all courses in art, dance, music, theater arts, and integrated arts, except that courses in the student's major department may not apply on this requirement. Also, Anthropology 143; Classics 151A, 151B, 151C; and Psychology 188A, 188B, 188C.

*Literature:* all courses in English, American or foreign literature (classical to contemporary), including work in translation. In addition to literature courses offered by language departments, the following are also acceptable: Classics 141, 142, 143, 144, 161, 162; and Humanities 1A, 1B, 101, 102, 103, 104, 105.

*Philosophy:* all courses in philosophy. Also Anthropology 140, and History 142A, 142B, 142C.

Individual departments may require additional courses in any of the four areas. No "199" courses may be applied on the general requirements of the College.

**Credit for Advanced Placement Tests**

Credit earned through the CEEB Advanced Placement Examinations may be applied on these requirements as follows: credit for English 1 and 2 will apply on the English Composition requirement; all foreign language credit will apply on the foreign language requirement; all credit in science and mathematics will apply on the natural science requirement; and all credit in history will apply on the social science requirement. Credit for History 7A will also satisfy the University requirement in American History and Institutions.

It is important to note that portions of Advanced Placement Test credit may be evaluated by corresponding UCLA course numbers; e.g. History 7A. If a student takes the equivalent UCLA course, deduction of unit credit for such duplication will be made prior to graduation.

**Departmental Requirements****THE MAJOR**

Each candidate for the bachelor's degree is required to complete a major in the College of Fine Arts with a scholarship average of at least two grade points per unit (C average) in all upper division courses, and must be recommended by the chairman of his major department.

A *major* is composed of not less than 14 courses (56 units), including at least nine upper division courses (36 units). The major includes both lower and upper division courses, arranged and supervised by the department and approved by the Executive Committee of the College.

Special attention is directed to the courses listed as *preparation for the major*. In general, it is essential that these courses be completed before upper division major work is undertaken. In any event, they are essential requirements for the completion of the major.

As changes in major requirements occur, students are expected to satisfy the new requirements insofar as possible. Hardship cases should be discussed with the departmental adviser, and petitions for adjustment submitted to the Dean of the College when necessary.

Any student failing to attain a scholarship average of at least two grade points per unit in his major department may, at the option of the department, be denied the privilege of a major in that department.

A department may submit to the Dean of the College the name of any student who, in the opinion of the department, cannot profitably continue in the major, together with a statement of the basis for this opinion and the probable cause of the lack of success. The Dean may permit a change of major, or may, with the approval of the President, require the student to withdraw from the College.

Any department offering a major in the College of Fine Arts may require from candidates for the degree a general final examination in the department.

### **ORGANIZED MAJORS AND CURRICULA IN THE COLLEGE OF FINE ARTS**

Departmental majors leading to the degree of Bachelor of Arts, with opportunities for specialization as indicated, are offered in the following areas:

**Art.** Art History, Design,\* Pictorial Arts.\*

**Dance.\***

**Music.** Composition and Theory, Ethnomusicology, Systematic Musicology, History and Literature, Performance, Music Education,\* Opera.

**Theater Arts.** Theater, Motion Pictures and Television, Secondary Teaching Curriculum.\*

With the proper selection of courses, including those designated by the Graduate School of Education, teaching credentials are available in the majors and specializations marked with an asterisk (\*).

### **Honors in the College of Fine Arts**

#### **DEAN'S HONORS**

Dean's Honors will be awarded each quarter to students completing the previous quarter's program with distinction according to criteria established by the Dean of the College.

#### **DEPARTMENTAL HONORS PROGRAMS**

Each department offering an undergraduate major may establish an Honors Program including special courses, or supplementary and advanced directed study, or both.

#### **COLLEGE HONORS WITH THE BACHELOR'S DEGREE**

College Honors are awarded at graduation to students with a superior overall grade-point average. The honor designations and the requirements for each are Cum laude, an overall average of 3.25; Magna cum laude, 3.6; Summa cum laude, 3.8. To be eligible for College Honors, a student must have completed at least 20 courses (80 units) in the University of California.

A list of students graduating with Departmental and/or College honors will be published in the Commencement Program, and honors earned will be recorded on each student's diploma.



## SCHOOL OF ARCHITECTURE AND URBAN PLANNING

The School of Architecture and Urban Planning at the University of California, Los Angeles, currently offers a two-year program of graduate study in the fields of Architecture and Urban Design, as well as an M.A.-Ph.D. program in Urban Planning. Additional programs related to the human environment and new types of planning processes will be introduced in the years to come. Currently, the School offers educational opportunities for a broad spectrum of careers, some not now in existence but reflecting social needs and new possibilities. Drastic changes are underway in the conception of the role of architects, urban designers and planners in the society of the future and, therefore, also in the education that would be appropriate to such future roles. The faculty believes that desirable new directions can be evolved by creating openly experimental programs. The cutting edge will be research and task-force-oriented field work (an "Environmental Design Workshop") integrated into the educational experience, a continuously unfolding learning process. We believe that education and research need not—in fact, must not—be divorced from service to the community, since we are seeking to evolve community-serving professions and the process of "learning to do good competently" should start at the earliest possible moment. The establishment of the School of Architecture and Urban Planning at UCLA reflects the University's concern with the escalating problems of our rapidly expanding and changing urban environment and its largely untapped potentialities. It finds itself in good company on the campus, with interest in urban, environmental, and quality-of-life issues gathering momentum in departments, schools and research institutes throughout the University.

### The Architecture and Urban Design Programs

In an increasingly urban civilization, the unprecedented rate of growth of the world's population has set in motion huge efforts to provide for man's needs to live and work in close proximity with other men. A new technology of city building is being evolved to keep pace with the accelerated rate of urban growth. Advances in methods of construction, building economics and organization, together with insights gained in the social and behavioral sciences, place at our disposal new resources with which to respond to the urban challenge. This enormous undertaking demands a group of professionals who can direct diverse forces toward the realization of better environments. The field of architecture, like so many of our professions and institutions today, is undergoing radical change. The old pattern of architectural practice as something that transpires between an individual architect and his client is no longer valid. The new pattern of the large architectural office serving a corporate client's needs may also soon fade. A more radical view of the architect is emerging. Increasingly, he is offering his services as a member of an interdisciplinary team of problem-solving specialists. To fulfill this role the architect will have to become a specialist himself; thus, the term "architect" will have in the future many specialized meanings. This school intends to prepare students to work at the frontiers of professional life, now so complex as to be beyond the grasp of any one man or any one discipline.

A response to the challenge of these new, complex problems has been the emergence of the area of Urban Design. At the moment Urban Design is a generic term that is defined in many ways by the people who consider themselves engaged in its realm of activities. The short history of Urban Design can be traced back to the post-war era of city rebuilding in Europe when the conceptual and operational inadequacies of the traditional architectural approach for dealing with complex urban environment-making were exposed. Designing at the new urban scale, which was larger both in physical and temporal dimensions, was vastly more complex than dealing with the stereotypical problems that the architect had previously been called upon to solve. Urban Design, particularly in the area of analysis, is currently undergoing rapid change brought about by the development of new methods in the physical and social sciences. The techniques and tools of computer science, regional science, cybernetics, information theory, forecasting, systems simulation and analysis, etc., have all become areas of interest to the Urban Designer as enhancements to his imagination and intuition.

### **The Architecture Program**

Graduates of the standard five-year curriculum in architecture today have acquired barely sufficient skills to survive within their own professional group. Preparation for the wider world of modern business, politics, science and industry in which today's architect finds himself requires at least two more years of specialized training at the graduate level. The School of Architecture and Urban Planning at UCLA at present offers a two-year graduate program in architecture leading to a Master of Architecture degree. Its purpose is substantially to broaden the outlook and the range of skills of the architecture school graduate by confronting him with challenging professional experiences and by exposing him to basic specializations evolving within the field of architecture.

### **Future Programs in Architecture**

The School has presently under study, a plan to open up the present two-year Architecture Program to students with training in other fields who desire training in an architectural specialty for purposes of teaching, consulting, and research. This expanded program, which will be available to the non-architecturally trained student, as well as the student with previous architectural training who has re-entered the University for study in a specialty, is expected to be ready for students in the Fall Quarter of the year 1970-71, and will lead to the degree of Master of Arts in Architecture. In the future, the degree Master of Architecture, will be reserved for a new three-year professionally-oriented program for graduate students with no previous training in architecture, who desire to become practicing professionals. This program is under current study and will be announced in a later catalogue.

### **The Urban Design Program**

The Urban Design Program leads to the degree, Master of Architecture, with a certificate in Urban Design. Graduates of the Program will be prepared to

perform professional services in Urban Design, a discipline which joins the normal concerns of the architect and urban planner.

The Program is based on the conviction that Urban Design education is closely linked to a number of interrelated disciplines. The curriculum is organized to respond sensitively to the creative and experimental ideas of those disciplines to permit the dynamic interaction of contrasting approaches. The Program incorporates related scientific and technological disciplines as an integral part of the design process. The entire multidisciplinary staff of the School of Architecture and Urban Planning is available for instruction in the Urban Design Program.

### **The Two-Year Master of Architecture Degree Program**

The two-year M.Arch degree Program is structured as follows:

The learning situations offered for which the student may receive credit can be divided into three broad bands:

1. seminar and classroom instruction
2. project/problem experience
3. close tutorial guidance in individual study

Superimposed upon all of these are the actual subject areas which the student will structure to match his interests.

The course of instruction or set of requirements for the student to fulfill in the Program has been intentionally set as loosely as possible. Each student working with his faculty tutor, will build a program to fit his particular interests and needs. However, all students should begin with a common project experience. From this project experience, classroom learning, and his own developing interests and skills, the goal is for the student, with tutorial guidance, to build a personal program of investigation. The goal is for the student to reach independent investigative power and motivation as soon as possible in the program. The final evidence of this independent intellectual maturity must take one or a combination of three forms:

1. a thesis paper
2. a thesis project
3. a comprehensive exam

### **TUTORIAL**

In addition to the conventional student-instructor and student-critic relationships, this new program depends heavily on the success of two other types of student-faculty contacts: advising and tutorial. It is desirable, although not necessary that the same faculty member act in both roles for a given student. Thus, from the beginning, both tutor and student are preparing the student for the thesis. To accomplish this the student should elect to take a tutorial course (496 or 596) with his tutor for one or more quarters. During other quarters he and his tutor may decide he should take several courses outside of the department. In fact, almost any course of action is possible as long as approval of the tutor is obtained and the requirements for the degree are met.

## DEGREE REQUIREMENTS

Every student must complete at least 18 quarter courses of graduate or upper division work, or 72 total units, or their approved equivalent, to qualify for the degree Master of Architecture.

Of these 18 courses, 15 must be taken within the School of Architecture and Urban Planning, unless special permission is obtained to concentrate in an area outside of the school. It should be noted, however, that the student may elect to take *more* than 18 courses, thereby increasing the number he may take outside the school.

Every student must take five courses in the 400 series. There are no other required courses.

Every student must submit a thesis paper or a thesis project to qualify for the degree. In exceptional cases, when recommended by a student's tutor, a student may be permitted to substitute the passing of a comprehensive exam for completion of the thesis requirement.

There is no foreign language requirement for the Master of Architecture degree.

The program lasts six quarters or two years and students are expected to be in full-time residence.

## ADMISSION REQUIREMENTS

The applicant is expected to have maintained a 3.0 grade point average during the last two years of formal college-level schooling prior to applying. In rare cases exceptions to this requirement may be obtained by writing directly to the Head of the Program.

The applicant should hold the degree Bachelor of Architecture or its equivalent. For exceptions to this in the future see *Future Programs in Architecture* above.

The applicant must submit three letters of recommendation from teachers or employers who have direct knowledge of his/her ability.

The applicant must submit examples of his/her creative work such as research papers, articles, theses, and design projects in Architecture or Urban Design. Preferably all material should be submitted in 8½" × 11" binders. Graphic material can be submitted as 35mm. photographic slides, preferably contained in 8" × 10" transparent plastic pocketed sleeves.

The applicant should indicate his research interests in a one-page typewritten statement.

Although not mandatory, practical experience prior to entry is encouraged and will be taken into account in selecting applicants.

The ability to understand, speak, read and write English fluently are essential requirements to participation in the Program. All foreign applicants will be tested prior to admission and failure to meet this qualification can form the basis for rejection from the Program. A special letter of instruction from the School on establishing proof of fluency in English will be sent to each foreign student when he/she applies.

## **The Urban Planning Program**

The Urban Planning Program in the School of Architecture and Urban Planning currently offers a curriculum leading to the Master of Arts and Ph.D. degrees. The normal course of study requires two years in residence for the Master's and an additional year for the Doctorate in Planning. These two degrees are considered to extend on a single continuum and do not represent diverging courses of study. The Doctor of Philosophy program allows the student to pursue his planning studies in greater depth and to acquire higher levels of competence in the relevant skills than is possible in the two years required for the Master's.

The curriculum is organized so that a student may obtain not only a theoretical and practical understanding of urban and planning processes, but also acquire a working knowledge of advanced analytical techniques for planning, high-order learning skills, capabilities for carrying out evaluations of complex urban phenomena, and critical interactive skills.

An important aspect of the student's education in the Urban Planning Program is the opportunity that will be afforded for internships and applied research. A number of projects of applied research will be initiated. Some of these, especially projects in the inner city, may be done in connection with the Environmental Design Workshop, a new institution whose distinguishing characteristic is its emphasis on client-centered projects that will permit a close working relationship to develop between clients, faculty and students. Students may also wish to work on a part-time basis outside the University under an internship arrangement for which a limited number of credit units can be given. Normally, such students will meet periodically with a professor to discuss problems arising from their work experience as well as prepare scholarly papers on aspects related to their internship program. Still other students may wish to take part in on-going campus research outside the Workshop or internship frameworks. Current planning research includes work on cognition and problem-solving through man-computer interaction, decision-making and computer design simulation, social indicators for monitoring metropolitan development, urban transportation, regional economic forecasting models, and comparative urbanization.

This emphasis on professional and field work experience will tend to modify traditional role distinctions and establish a collegiate relationship among students and faculty. As a result, students will share responsibility, together with their professors, for the development of the curriculum and related activities in the Program.

## **THE MASTER OF ARTS DEGREE**

In terms of a formal curriculum, at the Master's Degree level, the student elects one of three Areas of Policy Concentration (APC). The first, Urban-Regional Development Policy, concerns planning for broad social and economic development objectives of urban-regional systems and subsystems. It constitutes a framework for policy planning in housing, urban renewal, urban-regional economic growth, and urbanization in industrializing countries, among others. The second, Public Service Systems, refers to planning for functional programs contributory to urban and regional development, such as transport, education,

housing, health, and recreation. The third, Urban Land Development and Design Policy, concerns planning for physical development and the implications of different environmental settings for urban living. Work will also be offered in a fourth area of Social Development Policy but, at the moment, choice of this as an Area of Policy Concentration has been reserved for students admitted to the doctoral program only.

Roughly two-thirds of the student's time will be spent working in the Area of Policy Concentration of his choice. The remaining time is reserved for courses from the general or Core curriculum. Core courses are distinguished from those in the Area of Policy Concentration in that their subject matter cuts across different specializations. Work will be offered in three areas of core specialization: planning theory, urban theory, and planning methods.

The number of required formal courses is small, being restricted to introductory, survey-type courses. In concert with his faculty advisors, the student is able to arrange for a personally tailored course of degree study. In developing his curriculum, opportunity for involvement in field projects, internship work, and applied research will be emphasized.

Education at the Master of Arts level will give the student a degree of academic competence that will enable him to go on for the Ph.D. or work as a professional in public and private agencies concerned with advanced practice and research in the different aspects of urban development. While many students with a Ph.D. in Planning may be expected to devote a large part of their careers to teaching and research, others will probably be interested predominantly in practice at an advanced level. It is hoped, in fact, that most UCLA-educated planners will, in the course of their career, oscillate between positions in academia and practice, enriching both.

### **Admission Requirements**

*Undergraduate preparation.* The requirement for admission is a baccalaureate degree; a concentration in one of the social sciences, engineering, or design is desirable, but not essential. To be admitted, the student must present a superior academic record. Students who have any background deficiencies in study areas such as mathematics, statistics, or economics, will be required to round out their knowledge by taking additional course work early in their residence.

There is no foreign language requirement.

### **General Requirements**

The student must be in residence six quarters, except that the faculty and Head of the Program may accept up to three quarters of graduate work at another recognized planning school.

The student must take eighteen courses of graduate and upper division work of which thirteen will generally be graduate courses in the Urban Planning Program.

To fulfill the requirements of both the Graduate Division and the Urban Planning Program for a Master's thesis, students are expected to submit a research paper of publishable quality not to exceed in length the usual article for professional-scientific journals (up to 10,000 words). The research may be

related to the student's field work or internship project. In addition, students will be asked to submit a paper of unspecified length that would deal with the professional roles of planners in their Area of Policy Concentration. The purpose of this paper is to permit students to review and synthesize their educational experience in the Program.

### **THE MASTER'S DEGREE CURRICULUM**

In accordance with these general features, a student may select a "model" two-year curriculum leading to the Master of Arts degree in Urban Planning as follows:

#### **General Core Courses**

- 200. Introduction to Planning Theory
  - 210. Introduction to Urban Theory
  - 211. The City and the Planner: Current Issues and Future Problems (½ course)
  - 221. Introduction to Planning Analysis
- plus at least two electives within the "core" area.

#### **Area of Policy Concentration**

- 230. Introduction to Urban-Regional Development Policy
  - or
  - 240. Introduction to Public Service Systems
- plus six electives in the chosen Area of Policy Concentration and at least three full courses in a related "minor" field in other departments.

#### **Free Electives**

Each student may take up to two general electives for credit from any program offered in the University without regard to the specific relationship of the electives to his program in planning.

### **THE DOCTOR OF PHILOSOPHY PROGRAM**

To be admitted to the Doctoral Program, the student must have a Master's degree in Planning from a recognized school, or be capable and prepared to qualify himself in the material covered in such programs to the satisfaction of the faculty. A student who has any deficiencies in subject areas essential for work at the Ph.D. level, such as mathematics, statistics, or economics, is expected to fulfill the requirements early in his residence.

In general, two years of academic residence are required, of which no more than one year is in the Master of Arts degree program in the field of Planning. In addition, the student must meet the general Graduate Division requirements.

Doctoral students must demonstrate, by successfully passing a written examination, that they have thoroughly mastered the field of urban planning and its literature, including the subject areas of planning theory, urban theory, and methodology. Ph.D. students will be expected to take between twelve and sixteen additional units in these areas beyond the M.A. requirement.

In addition, doctoral students must elect a major Area of Policy Concentration to which all the rest of their studies are then related. Again, a written exami-

nation must be taken to demonstrate scholarly competence and an ability to contribute to existing knowledge through research. The department may also review the field work or internship work, and, if necessary, require an oral examination. The Ph.D. students must also complete at least sixteen units of course work in a minor field outside of the Department.

After the student has successfully completed (a) his examination in his major field of policy concentration and (b) his minor field, he will sit for a qualifying oral examination to be conducted by his dissertation committee. Upon passing this examination, the student will be advanced to candidacy.

## **GRADUATE SCHOOL OF BUSINESS ADMINISTRATION**

The Graduate School of Business Administration offers curricula leading to the graduate degrees of Master of Business Administration, Master of Science, and Doctor of Philosophy in Business Administration. The School also offers a Certificate of Resident Study for foreign scholars. The Department of Business Administration offers certain courses which may be elected by undergraduate students.

### **Preparation for Graduate Study**

Students in other schools or colleges may elect a limited number of undergraduate courses in the School, particularly if taken as preparation for graduate study in business administration. Economics majors may, without petition, apply two of the following courses toward the requirement for nine upper division Economics courses.

Business Statistics,	BA 115A
Intermediate Accounting,	BA 120A
Intermediate Accounting,	BA 120B
Managerial Accounting,	BA 120M
Business Finance,	BA 130

Students with an interest in graduate study in business administration may pursue any undergraduate major. For example, a student planning to enter the M.S. degree program in computer methods, mathematical methods or statistics may wish to choose an undergraduate major in mathematics; or a student interested in the field of marketing or socio-technical systems may prepare through a major in one of the behavioral sciences or in engineering.

Detailed information about preparation for graduate programs in Business Administration may be obtained from the Graduate Student Affairs Office, Graduate School of Business Administration.

### **The Graduate Program**

The Graduate School is a professional division of the Graduate Division of the University of California. Its objectives are as follows:

To prepare exceptionally qualified students for careers as teachers and research scholars in the areas of management, organizational behavior and the traditional fields of business administration.

To provide professional education that will develop in qualified students the



intellectual and personal attributes that are needed for successful careers in management or as staff specialists in public or private enterprises.

To enlarge through research the body of systematic knowledge about business administration, the management process, and the environment in which the enterprise functions, and to disseminate this knowledge through publications and improved teaching materials.

To offer management development programs for experienced businessmen.

### ADMISSION

Applicants to the Graduate School of Business Administration must meet the requirements for admission to the Graduate Division of the University as well as those of the School. Application forms must be filed by each student for both the Graduate Division and the Graduate School of Business Administration.

**Applications.** Early application *with complete documentation\** is advisable because the number of applicants may exceed the number of students who may be accommodated in any degree program. Inquiries should be directed to the Graduate Student Affairs Office, Graduate School of Business Administration. Application deadlines are as follows:

Quarter	Masters	Ph.D.	All Foreign
Fall	March 15	January 15	January 15
Winter	October 15	July 15	July 15
Spring	October 15	July 15	July 15

NOTE: Students may apply for the Unified MBA Program only in the Fall Quarter.

### ADMISSION TO GRADUATE STATUS

Graduate students are admitted to graduate status on the basis of promise of success in the work proposed, as judged primarily by (1) previous college record and (2) performance on the Admission Test for Graduate Study in Business.

To be admitted to graduate status in the School, a student is required to have an undergraduate scholarship average of grade B in all courses taken in the junior and senior years and at least a B average in all postbaccalaureate course work completed. Admission to the Ph.D. program is limited and is based on a scholarly record of distinction in both undergraduate and any completed postgraduate work. Three letters of recommendation must accompany all Ph.D. applications.

All applicants are required to take the Admission Test for Graduate Study in Business prior to admission. The test is given four times a year in various locations in the United States and several foreign countries. Students should write to the Educational Testing Service, P.O. Box 966, Princeton, New Jersey, for information regarding application and the time and place of the examina-

\* Documentation includes: 1. Official transcripts of record *in duplicate* covering all collegiate and university work completed, together with official evidence of degree(s) conferred. (Students graduating from UCLA need submit only one copy of the undergraduate record.) 2. Application to the Graduate Division. 3. Application to the Graduate School of Business Administration. 4. Educational Testing Service score on the *Admission Test for Graduate Study in Business*.

tion. They must request the Service to forward the test results to the Assistant Dean, Graduate Student Affairs Office, Graduate School of Business Administration. Foreign students are also required to take the Test of English as a Foreign Language (TOEFL). Information concerning this test is also available at the Educational Testing Service.

Elementary finite mathematics and elementary calculus are required for all graduate programs in the School. This requirement may be fulfilled by passing a placement examination or by taking course 402 during the first quarter of graduate study. Arrangements may also be made with the Dean of Graduate Student Affairs for fulfilling the requirement by taking courses offered by the Mathematics Department.

All graduate programs are full time. Employment, other than research and teaching assistantships, is not permitted for students in the Ph.D. program. Graduate students in all programs are required to enroll for at least two courses per quarter.

### **MASTER OF BUSINESS ADMINISTRATION DEGREE**

The student may choose between two programs leading to the MBA degree: the *Curriculum* and the *Unified Program*. Both prepare students for careers in the management of business firms or other formally organized enterprises; and both center upon knowledge, skills, and techniques which are useful for designing and maintaining effective organizations and relating them properly to their environments. Both stress the spirit of inquiry as a basis for lifelong learning and growth.

The following table summarizes certain features of the two programs, indicating their similarities and differences.

#### **The Master of Business Administration Curriculum**

The MBA Curriculum is a two-year program, whose first-year course requirements may be satisfied in whole or in part by the completion of equivalent courses prior to admission or by passing placement examinations. Students who have fulfilled part of the first-year requirements may, with the approval of the Assistant Dean of Degree Programs, take second-year courses concurrently with the completion of their first-year work.



**MBA  
Curriculum**

**Unified  
MBA Program**

<b>Eligibility</b>	Recognized bachelor's degree in business or non-business field	Recognized bachelor's degree in any non-business field and the equivalent of a year of economics and mathematics through calculus
<b>Admission</b>	Any Quarter. Applications accepted March 15 and October 15, (see page 22.)	Fall Quarter only
<b>Sequence of courses</b>	Student selects from recommended sequence of courses	Faculty team builds sequence into an integrated program
<b>Student relations</b>	Student enrolls in each course as an individual	Student becomes member of group which stays together for two years
<b>Special features</b>	Students with Business Administration major may complete curriculum in one year	Close student-faculty relations Heavy emphasis on student responsibility and initiative Field experience in solving real-life management problems Spontaneous seminars and short-term learning units to meet emerging interests
<b>Time Commitment</b>	Varies with individual class schedule	Varies, usually involves Monday, Tuesday, Thursday and Friday classes
<b>General requirements</b>	B average Minimum two-course loads per Quarter, total program not to exceed three calendar years	B average 2 years continuous residence (3 Quarters each year)

**FIRST YEAR PROGRAM**

The required first-year courses and the normal pattern for taking them are as follows. *First quarter*: Business Economics 401, Mathematics for Management 402, Financial and Managerial Accounting 403A (with computing laboratory 403B), and Business Communications 405. *Second quarter*: Business Fluctuations 406, Business Statistics 407, Business Finance 408, Management Theory



and Policy 409. *Third quarter*: Behavioral Science Foundations 404, Operations Management 410, Elements of Marketing 411, and one elective.\*

Mathematics 2A-2B may be substituted for Mathematics for Management 402, and is normally taken in the first and second quarter.

## SECOND YEAR PROGRAM

At least nine courses must be completed, including the following required courses: Business, Labor and Government 421, Business Economic Policy 422, Advanced Management Theory 423, Business and Society 424, and Business Policy 425A-425B (a double course, which must be taken in the last quarter, and which includes the Comprehensive Examination).

Each student also elects at least three courses from within or outside the School, in the 100, 200, 400, and 500 series (limit of two 500 courses for credit for minimum course requirement).

## GENERAL REQUIREMENTS

Residence is required for at least one academic year (three quarters). The nine courses required in the second year must be completed in residence on the Los Angeles Campus. A scholastic average of at least B (3.0 grade points) must be maintained. A student must maintain minimum progress toward the MBA by completing at least *two courses per quarter*, subject to a total time limitation of three calendar years for completion of all requirements. There is neither a foreign language nor a thesis requirement.

## The Unified Master of Business Administration Program

The Unified MBA Program is open to selected students whose undergraduate major is *not* in Business Administration. It is designed to prepare broadly-educated young men and women for executive careers in business, industry, and government.

This program is conceived, not as a traditional series of courses, but as a two-year coordinated effort to sharpen the intellectual skills of selected students, to develop their knowledge of basic organizational and economic concepts, to deepen their understanding of themselves and their potential, and to improve their problem-solving and communication skills. The goal is to develop a capacity for excellence which makes a valued employee, colleague, and leader.

A faculty team, representing all the disciplines of the School, plans and conducts the program. Students enrolling each fall quarter are treated *as a group* of managers in training. Subject matter from the various disciplines is presented in a sequence designed to build the students' ability to analyze and solve the complex problems of modern organizations. The faculty team and the student group work closely together in assessing and adjusting the pacing and pattern of the learning process. Every effort is made to reflect in the learning activities the flexibility and need for initiative and self-direction which is essential for successful management.

\* X 400 courses offered in University Extension do not apply on these requirements.

**FIRST YEAR PROGRAM**

The first year of studies emphasizes key concepts in accounting, computers, communications, behavioral science, economics, finance, marketing, personnel management, industrial relations, quantitative methods, and operations management.

**SECOND YEAR PROGRAM**

The second year of work emphasizes the application of management principles to policy problems in selected Los Angeles firms. In addition, students and faculty examine broad issues concerned with the relationship of business and society, the implications of continuous change and growth in business and technology, and management theory. Emphasis is placed throughout on approaches to personal creativity.

Each student also elects two courses from within or outside the School, in the 100, 200, 400, and 500 series (limit of two 500 courses for credit for minimum course requirement).

**GENERAL REQUIREMENTS**

Continuous full time residence (fall, winter and spring quarters) is required for two consecutive years. A scholastic average of at least B (3.0 grade points) must be maintained. No foreign language is required.

**THE MBA-VISTA PROGRAM**

In response to the urgent need for the economic development of low-income communities, the MBA-VISTA Program has been designed (1) to prepare students, especially minority students, for management positions in organizations engaged in economic development activities; and (2) to assist minority-owned businesses, community-owned cooperatives, and aspiring entrepreneurs in the low-income communities of the Los Angeles area. The MBA-VISTA Program provides a two-year experience which combines study for a Master's degree in Business Administration and special service as a VISTA consultant to economic entities in the low-income communities in the Los Angeles area.

During the first year, students will take the standard MBA core courses in either the Unified MBA Program or the MBA Curriculum depending on their prior background, plus a special seminar on strategies for economic development. After completion of the first year course requirements, students will join VISTA and be placed in community agencies engaged in economic development activities and receive the standard VISTA salary and living allowance.

In addition to work in the low-income communities, students will take two courses each quarter, which cover the basic material of the second year of the MBA Curriculum. After successful completion of the course work, comprehensive examination and VISTA service, the student will be granted the MBA degree.

**MASTER OF SCIENCE DEGREE**

The M.S. degree program in Business Administration is designed to prepare the student for a career as a specialist contributor to the management of formally organized enterprises, in one of the following major fields:

Accounting  
 Arts Administration  
 Business Economics  
 Computer Methods  
 Finance  
 Industrial Relations  
 Information Systems  
 International and Comparative  
 Management  
 Management Theory and Policy

Marketing  
 Mathematical Methods  
 Operations Management  
 Operations Research  
 Risk Bearing and Insurance  
 Socio-Technical Systems  
 Statistics  
 Transportation and Traffic  
 Management  
 Urban Land Economics

This program is also suitable for students who plan to continue their studies and earn the Ph.D. degree. The major in accounting includes the opportunity to prepare for the certified public accountant examination.

The M.S. program requires one to two years of study depending upon the student's advance preparation and choice of a major field.

#### **PREREQUISITES**

The following basic courses or their equivalents, which may be completed before or after admission, are formally required as prerequisites in all areas: Business Economics 401, Accounting 403A (with computing laboratory 403B), and Business Fluctuations 406. The following courses or their equivalents are required in all areas *except* Statistics and Mathematical Methods, Operations Management, and Operations Research: Mathematics for Management 402 and Business Statistics 407.\* Additional prerequisites are also specified by the faculty in each major field.

The fulfillment of prerequisite requirements by previous course work may be subject to validation by examination. Such examinations are required for 401, 402, 406, 407, and are given during Registration week each quarter.

#### **ADVANCED WORK: THE MAJOR FIELD**

The faculty in each major field specifies course requirements for the major, which may include individual courses or minor concentrations in other fields. The student's entire program of advanced work must comprise at least nine courses, beyond the prerequisites (including those specified for his major field). The program must include at least five courses in the 200 series. It may include one course 597, *Preparation for Examinations in Business Administration*, four courses in the 596-series, *Research in Business Administration*, and one or two 598-series courses, *Thesis Research in Business Administration*, provided that prior approval is obtained and that no more than four 500-series courses may be applied to the University minimum requirements for the M.S. degree.

Each student must complete a master's thesis or pass a comprehensive examination in his major field. A master's thesis is required in marketing. A comprehensive examination is required for majors in accounting. In all other fields, a student may choose, with faculty approval, either a comprehensive examination or a thesis.

\* X 400 courses offered in University Extension do not apply on these requirements.

**GENERAL REQUIREMENTS**

Residence is required for at least one academic year (three quarters). The nine courses of advanced work for the M.S. degree must be completed in residence on the Los Angeles Campus. A scholastic average of at least B (3.0 grade points) must be maintained. A student must maintain minimum progress toward the M.S. degree by completing at least *two courses per quarter* subject to a total time limitation of three calendar years for completion of all requirements. There is no foreign language requirement.

**INFORMATION ABOUT MAJOR FIELDS**

Detailed information about the requirements of each major field, including prerequisites as well as required advanced work for the M.S. degree, can be obtained by writing to the Assistant Dean, Graduate Student Affairs Office, Graduate School of Business Administration.

**DOCTOR OF PHILOSOPHY DEGREE****BASIC UNIVERSITY REQUIREMENTS**

See pages 156-158.

**DEPARTMENTAL REQUIREMENTS**

The program leading to the degree of Doctor of Philosophy in Business Administration provides an advanced integrated education in organization and management studies and intensive training in research methods applicable to enterprise problems. The program prepares the student for a career in university teaching and research or for a career as a staff specialist in any organization where management skills are required.

The doctoral program is intended for mature persons with demonstrated intellectual ability of high order. Applications are welcomed from persons with degrees in the social and physical sciences, engineering and other academic fields as well as those who have had previous work in management studies. It is not necessary to have earned a master's degree to enter the program.

**CORE REQUIREMENT**

Each student must attain a basic literacy and analytic competence in management studies early in his course of study. The holder of an MBA degree from UCLA (or another comparable degree) is considered to have fulfilled this requirement. Others with substantial, but less extensive, backgrounds in management studies will be directed into additional work.

**FOREIGN LANGUAGE**

See the language announcement available from the Graduate School of Business Administration for the details of the foreign language requirement.

**FIELDS OF SPECIFIC INTEREST**

The student will be required to develop competence in two minor fields in addition to his major area of concentration. The student must satisfy requirements for the minor fields prior to his examination in his major field, and the requirements for the major field before the qualifying oral examination. One,



and in some cases both, minor fields may be taken in other departments of the University. The level of competence required in the major field is that of a professional scholar. Preparation normally requires the equivalent of at least one year (three quarters) of full time advanced study.

#### **EVIDENCE OF RESEARCH ABILITY**

Before taking the qualifying oral examination, each student must provide evidence of research ability, usually in the form of a finished paper which demonstrates ability *to organize a research activity and carry it to completion*. A master's thesis or any other completed work of significant quality may be accepted as evidence.

#### **QUALIFYING ORAL EXAMINATION**

The qualifying oral examination is a University requirement for advancement to candidacy for the Doctor of Philosophy degree.

#### **THE DISSERTATION AND FINAL ORAL EXAMINATION**

The acceptance of the dissertation and the satisfaction of the committee in the final oral examination complete the formal University requirements. Consult page 158 for the details on the preparation of the dissertation.

#### **CERTIFICATE OF RESIDENT STUDY FOR FOREIGN STUDENTS**

The Certificate of Resident Study is issued to bona fide foreign students who otherwise would have no evidence, other than the formal transcript of record, of full-time resident study. Those not wishing to earn a specific degree may apply for the Certificate of Residence Study after having completed at least three quarters of full-time study with an acceptable scholastic average, or must have carried out satisfactorily a research study program lasting nine calendar months or more. *Certificates of Resident Study will not be issued for any studies covered by a diploma or other certificate.*

### **SCHOOL OF DENTISTRY**

The UCLA School of Dentistry occupies facilities in the Center for the Health Sciences. It enrolls classes of 96 students each year in a four-year course of study leading to the degree of Doctor of Dental Surgery. Students undertake a comprehensive program in the biological and technological sciences to foster the highest standards of clinical competence in the practice of dentistry.

#### **Predental Requirements**

Modern dentistry provides exciting opportunities for blending art and science, technology and biology. The predental student will therefore wish to test his abilities in handling both biological and physical sciences. In addition, there are many other aspects in the broadening scope of dentistry which contribute to preparation for a career in private practice, in academic dentistry, and in the Armed Forces and Public Health Service.

It is desirable, however, for the predental student to prepare himself for broad professional activities. He should take advantage of the opportunity at

the college level to extend his cultural background, his knowledge of languages and the behavioral sciences. Many pre-dental students now avail themselves of advanced educational opportunities so as to qualify for admission to graduate divisions, in which case the student may find it important to have completed more than two years of college work prior to admission to a school of dentistry.

The basic educational requirement for admission to the School of Dentistry is a minimum of three years of college work (90 semester or 135 quarter units including the courses listed under the College of Letters and Science on page 83 of this bulletin).

### **APTITUDE TEST**

The School requires satisfactory performance on the American Dental Association Aptitude Test given by the Council on Dental Education of the American Dental Association.

The Aptitude Test is given in October, January and April and all applicants are required to take this examination no later than October of the calendar year prior to the one for which they are applying.

When taking this test, the candidate should specify the schools where applications are to be filed so that the test results may be mailed directly to the appropriate schools.

### **Graduate Training Program**

A graduate training program providing support for advanced education in health sciences fundamental to oral biology has been established jointly by the School of Dentistry and the Graduate Division under the auspices of the National Institutes of Health.

Training in this program will ordinarily lead to the Ph.D. degree in one of the following areas: Anatomy, Physiology, Biological Chemistry, or Medical Microbiology and Immunology.

Consideration will also be given to other health science-related disciplines if proved to be in the best interest of potential candidates.

Individuals applying for this opportunity must be qualified for admission to the Graduate Division of the University of California (bachelor's degree or its equivalent) and must have shown promise for research work and motivation for the pursuit of an academic career. They must be citizens of the United States or have filed a declaration of intent.

Interested applicants should contact the Director of Oral Biology Research Training Program, School of Dentistry, Center for the Health Sciences, UCLA.

### **APPLICATION PROCEDURE**

An application for admission to the class entering in September 1971, should be submitted as early as possible, but no later than October 31, 1970. The application form may be obtained from: Office of Admissions, School of Dentistry, Center for the Health Sciences, University of California, Los Angeles, California 90024.

An official transcript from each high school and college attended must be sent directly to the above address. It is the applicant's responsibility to arrange

for the forwarding of these documents which should reach this address by October 31, 1970.

Further information is provided in the UCLA ANNOUNCEMENT OF THE SCHOOL OF DENTISTRY, which will be mailed upon request.

## GRADUATE SCHOOL OF EDUCATION

Four advanced degrees are offered by the Graduate School of Education: Master of Arts in Education, Master of Education, Doctor of Education, and the Doctor of Philosophy in Education. The degree programs are designed for the development of leadership in various educational fields.

The Graduate School of Education offers curricula leading to state credentials in the following fields: elementary; secondary; junior college teaching; pupil personnel services; supervision; and school administration.

### THE DEPARTMENT

The Department of Education is organized into six areas. The Area of Cultural Foundations offers instruction in philosophy of education, educational sociology, history of education, vocational education and comparative education. The Area of Educational Psychology offers programs in development and learning, statistics and measurement, and counseling. The Area of Curriculum and instruction offers work in curriculum at the various levels in specific subject fields, and in special educational programs. The Area of Administrative Studies offers programs in supervision and school administration. The Area of Higher Education offers facilities for studying various aspects of junior college, senior college, and adult education. The Area of Special Education offers instruction and research facilities in the education of exceptional children, emphasizing programs for the mentally retarded, educationally handicapped, and gifted. All areas cooperate in maintaining basic courses for the credential and degree programs.

The School is administered by a Dean; an Associate Dean for Academic Affairs, who is also Chairman of the Department; a Vice-Chairman; and Assistant Deans in charge of Financial Affairs, Student Affairs, Teacher Education and Urban Affairs.

### Credential Programs†

To assure eligibility for a credential, the student must meet certain requirements *during his first quarter* of enrollment in courses in Education. Only students meeting the following requirements may enroll for a second quarter:

#### Communication Skills

During the first quarter the student must pass standardized tests given by the Office of Student Services in English. The student must also demonstrate that he is free from gross speech defects.

† For additional information, consult an adviser in the Graduate School of Education.

**Academic Achievement**

An undergraduate's transcripts must indicate at least a 2.0 overall grade point average. A graduate student must meet the admission requirements of the Graduate Division including a 3.0 grade point average. In order to remain in a teaching program after admission, undergraduate students must satisfy the scholarship requirements of the respective colleges. Graduate students must remain in good standing with the Graduate Division and must maintain at least a 3.0 grade point average.

**Physical and Mental Health**

The student must secure from the Student Health Service preliminary approval for the study of education at the time of his first involvement with education courses. This shall indicate that his health is such that he can perform the duties normally expected of teachers on the academic level he plans to teach. This procedure shall be repeated before the student's first teaching assignment.

**Personal Fitness**

An individual with a criminal record, or one incapable of normal personal-social relationships, is barred by law from teaching in California.

**University Elementary School**

The University Elementary School serves as a center for research, inquiry and experimentation in education as well as providing a research laboratory for more than twenty other departments in the University. Thousands of visitors from all parts of the world visit the University Elementary School every year. Demonstrations are planned for these visitors as well as university classes in education, psychology, pediatrics, psychiatry, art, music, physical education and many other departments on request. Closed-circuit television provides classroom and other specialized demonstrations for University students at many points on campus. Opportunities for internship are available to a limited number of teachers and education students.

The staff of the School includes a director, principal, master teachers, teachers temporarily assigned from public school districts, teachers engaged in residency training, and students learning to teach. Some are generalists, other specialize in a subject field. Auxiliary personnel include a nurse, social worker, and consultants from medicine, psychology and psychiatry.

A heterogeneous population of approximately fifty children at each age level from three to twelve are educated in this nongraded school in team-taught classrooms. Each student is individually diagnosed and his educational program is custom tailored to his needs.

The School plant is designed to utilize fully a beautiful setting combining indoor and outdoor work areas. With minimum architectural change, it has been adapted to house an innovative educational program. The plant includes 17 classrooms, a community hall, art studio, children's library, conference rooms, film and observation room, office facilities and a playground designed to facilitate an innovative instructional program in movement.

## **Neuropsychiatric Institute School**

The Neuropsychiatric Institute School serves as a demonstration, training and research setting for the Department of Education and offers observation, classroom participation and graduate research opportunities for the Area of Special Education. The School is located in the Neuropsychiatric Institute, a California State Department of Mental Hygiene facility, in the UCLA Center for Health Sciences.

The NPI School provides schooling for some 40 emotionally disturbed and 60 mentally retarded inpatients. The staff includes a principal, a special education director, and ten teachers who conduct programs at the preschool, elementary, intermediate, secondary, and young adult levels. The staff also participates in research and service activities in conjunction with the newly established Mental Retardation Center. NPI staff members hold demonstration teacher appointments in the Graduate School of Education, and a faculty member in the area of special education holds a joint appointment in the Department of Psychiatry.

## **Office of Student Services**

The Office of Student Services helps prospective students in Education explore and choose appropriate fields and levels of school service; advises them concerning courses and procedures to follow in qualifying for graduate degrees, credentials, and certification for public school service; and counsels them on professional matters during their stay at the University. Students may request interpretation of test results, assistance in programing to meet specific credential and degree requirements, and counseling on personal and professional matters.

In addition, the Office serves as a selection agency to determine eligibility for professional programs under the supervision of the Committee on Professional Fitness; handles details of enrollment in classes; refers candidates for graduate programs to appropriate faculty advisers; makes recommendations for scholarships and fellowships; conducts research on student and professional problems; and formulates periodic reports on student personnel.

The staff consists of a Head who coordinates the work of the Office, a graduate adviser who handles advising of all candidates for graduate degrees, and counselors who advise candidates for credentials.

It is important that each student establish contact with the Office of Student Services so that he may determine his eligibility for the program he wishes to enter, receive assistance in the selection of courses, and fulfill all requirements for admission. Enrollment for a second quarter is contingent upon his having completed all necessary steps satisfactorily during the first quarter.

## **Teacher Training Facilities**

Internship and supervised teaching are carried on in selected elementary and secondary schools in the greater Los Angeles area. Opportunities for working with pupils from a range of socio-economic environments are offered. Student teachers are assigned to work in classrooms under the supervision of highly

competent, experienced teachers. One or more supervisors is assigned to each training school to help both student teachers and supervising teachers. Certain classes taught by superior teachers are designated as demonstration classes and are open to visitation by University students and others. The Head of Supervised Teaching is responsible for the assignment, supervision and evaluation of student teaching. School classroom observation and participation are included in several courses which precede or parallel student teaching.

### **Admission to Graduate Degree Programs**

In order to qualify for graduate status in Education, the student must (1) hold a degree of Bachelor of Arts or Bachelor of Science from the University of California, or its equivalent; and (2) have earned a grade point average of at least 3.0 in all 100 series courses.

A student seeking admission to the Graduate Division must file a formal application, results on the Aptitude Test of the Graduate Record Examination and an official transcript of his record in *duplicate* from each college and university he has attended. Requests for an *Application for Admission to Graduate Status* may be made directly to the Office of Student Services of the Graduate School of Education, Moore Hall, University of California, Los Angeles. Last days to file for admission to the Graduate Division for the Fall Quarter, 1970, are January 31, 1970, and April 15, 1970. The January 31 date is for applicants wishing an early decision for those persons applying for fellowships and scholarships, and assistantships. The final day for filing for admission for the Winter Quarter, 1971, and the Spring Quarter, 1971, is October 15, 1970.

The Dean of the Graduate Division may deny admission if the record of scholarship is not sufficiently distinguished, or if the undergraduate program has not been of such a character as to furnish an adequate foundation for advanced academic study. Applications for advanced study in Education are referred by the Dean of the Graduate Division to the School of Education for recommendation before admission is approved.

### **Summer Sessions**

In order to have graduate courses taken in Summer Sessions accepted as partial fulfillment of the requirements of graduate courses for higher degrees or credentials, the student must be admitted in graduate status.

### **Transfer Credit**

Credit from another accredited college or university which can be applied to the master's degree programs at UCLA is limited to no more than two quarter courses or five semester hours. Only those courses which are accepted by the other institution toward meeting its master's degree requirements may be considered for transfer purposes. Requests for such transfer are made by the student through the Office of Student Services at the time of Advancement to Candidacy. Such courses may not be used to reduce the minimum residence requirement or the minimum requirement for strictly graduate Education courses. No transfer credit is allowed for either the Ed.D. or Ph.D. degree.

### Extension Courses

Upon the recommendation of the Graduate School of Education and approval of the Graduate Council, no more than two courses taken in University Extension may be accepted toward the course requirement for the M.A. or M.Ed. degree. Only Extension courses taken prior to July, 1969 may be applied, and credit will be accepted only for those XL 100 series courses prefixed by an asterisk (\*) in the announcement of University Extension course offerings, LIFELONG LEARNING. None may be used in meeting requirements for doctoral degrees. Grades for Extension courses will not be taken into account in computing scholarship averages.

Petitions for acceptance of credit for courses taken in University Extension are presented at the time the candidate files application for advancement to candidacy.

### Graduate Record Examination‡

The Aptitude Test of the Graduate Record Examination or the equivalent approved by the Office of Student Services is required prior to admission to graduate status for all candidates for the graduate degrees in education; and for the Pupil Personnel Credential, Administration Credential, Supervision Credential, and Junior College Credential. This regulation applies both to new applicants and to those seeking readmission or renewal of previous applications.

Arrangements for taking the Graduate Record Examination may be made by contacting the Educational Testing Service, at either 20 Nassau Street, Princeton, New Jersey, or 1947 Center Street, Berkeley, California 94720, or 2200 Merton Avenue, Los Angeles, California 90041.

The results of this examination should be sent to the Office of Student Services, Graduate School of Education, University of California, Los Angeles, California 90024.

### Scholarship Requirement

Only courses in which the student is assigned grades A, B, or C are counted in satisfaction of the requirements for graduate degrees. Furthermore, the student must maintain at least a 3.0 grade point average in all courses elected at any campus of the University of California subsequent to the bachelor's degree; this includes all courses in the student's program.

### Continuous Registration

All graduate students are required to register for at least three quarters every year until completion of all requirements for the degrees for which they are working, unless they are granted a formal leave of absence. No more than one year of leave is permitted. Failure to register or to take a leave of absence will constitute presumptive evidence that the student has withdrawn from the University.

See announcement of the Graduate Division.

‡ Foreign students may defer the Graduate Record Examination until they are enrolled. Special arrangements for candidates who cannot meet the schedule demands of the Graduate Record Examination may be made through the Office of Student Services.

**Credit by Examination**

A limited amount of credit in courses in the 100 series may be obtained by examination. For general regulations governing credit by examination, consult the pamphlet, **STANDARDS AND PROCEDURES FOR GRADUATE STUDY AT UCLA**.

**Master of Arts in Education**

The Master of Arts degree is designed to permit flexibility and concentration around the candidate's thesis problem.

**Amount and Distribution of Work**

At least nine courses and a thesis must be completed in graduate status, and at least five of the nine courses must be in the 200 and/or 500 series in Education. With the permission of the candidate's chairman, advanced courses in departments other than Education may be accepted in partial fulfillment of the degree requirement.

All students are required to complete a research course chosen from 200A, 200B, 200C, 210A, 210B, 210C. In addition to this general requirement, the candidate selects, with the aid of the graduate adviser, courses from one or more of the following fields of specialization.

**Area I. Cultural Foundations of Education.** (See courses 100, 108, 200A-208B)

**Area II. Educational Psychology.** (See courses 112, 210A-214C, 217A-217C, 415A-415B, 418A-419B)

**Area III. Curriculum and Instruction.** (See courses 124A-124C, 130; 137A-137C, 420A-420C, 424A-424E, 433A-433B, 436A-436E, 437A-437C, 439A-439B)

**Area IV. Administrative Studies.** (Not available at the master's level)

**Area V. Higher Education.** (See courses 209A-209B, 431) (Available at the master's level by special permission only)

**Area VI. Special Education.** (See courses 116, 128A-128E, 228A-228E, 416A-416B)

**Residence**

The minimum requirement for the master's degree is one year of work. The candidate must maintain residence by taking a minimum of one course in each of three quarters unless granted a formal leave of absence. The total period of time from the beginning of course work to the completion of requirements for the degree may not exceed four years unless a petition to the Committee on Graduate Degrees for extension of time is granted.

**Application for Advancement to Candidacy**

The application must be filed not later than one quarter prior to completion of course requirements for the degree.

**Thesis**

Though limited in scope, the master's thesis must attack a problem in a systematic and scholarly way. Before beginning work on a thesis, the student



must receive from his chairman approval of the subject and general plan of investigation. Ultimately it must be approved by the student's thesis committee. The committee is selected by the chairman and the candidate and officially appointed by the Dean of the Graduate Division. One of the three members must be from a department other than Education.

### **Advising**

Information on step-by-step progress in the program is available from the graduate adviser in the Office of Student Services. Advice on initial course selection, faculty members to be consulted, consent for substitutions, forms to be filed at various stages, information on fellowships and subsidies, and general advising may also be requested.

### **Master of Education Degree**

The Master of Education degree is designed to provide a comprehensive background in the fields basic to teaching, combined with an application of that knowledge in a specific field. It is a professional degree, and carries the additional requirement that the candidate must be working toward an elementary, secondary or junior college teaching credential.

### **Amount and Distribution of Work**

At least nine courses must be completed in graduate status, at least six of which are graduate level. With the permission of the Committee on Graduate Degrees, advanced courses in departments other than Education may be accepted in partial fulfillment of the degree requirement.

The candidate must complete such course work as he may need to qualify for the comprehensive examinations.

### **Residence**

The minimum requirement for the master's degree is one year of work. The candidate must maintain residence by taking a minimum of one course in each of three quarters unless granted a formal leave of absence. The total period of time from the beginning of course work to the completion of requirements for the degree may not exceed four years, unless a petition to the Committee on Graduate Degrees for extension of time is granted.

### **Application for Advancement to Candidacy**

The application must be filed not later than one quarter prior to completion of course requirements for the degree.

### **Advising**

Information on step-by-step progress in the program is available from the graduate adviser in the Office of Student Services. Advice on course selection, consent for substitutions, application for the comprehensive examinations, forms to be filed at various stages, information on fellowships and subsidies, and general advising may also be requested.

## **Doctor of Education Degree**

The Doctor of Education degree is designed to provide breadth in the increasingly complex field of Education, and to aid in the development of leadership in a number of fields.

### **Admission**

After adequate work to establish an academic record, the candidate's qualifications are presented to the Committee on Graduate Degrees for admission. To be admitted, the student must: (1) have completed the equivalent of a master's degree in Education; (2) have passed such examinations as may be specified by the Committee on Graduate Degrees; (3) have maintained at least a 3.0 grade point average in all work completed since the bachelor's degree, including that at UCLA; (4) have secured agreement of a resident graduate faculty member of the Department of Education to serve as sponsor and chairman of his dissertation committee; (5) be recommended for admission by at least two additional resident graduate faculty members of the Department of Education, with whom ordinarily he will have had course work.

### **Amount and Distribution of Work**

The student must complete such course work in a major and two minor areas as his dissertation committee may specify, ordinarily at least two full years (six quarters of at least 1 course each) prior to advancement to candidacy. The course work is followed by three written comprehensive examinations, an oral qualifying examination, a dissertation and by a final oral examination.

With the permission of the candidate's chairman, advanced courses in departments other than Education may be accepted in partial fulfillment of the requirement.

Once admitted, the candidate's program of study is individually designed by his sponsor to prepare him for examinations in a major and a minor field in education and in a related field either in education or in another department.

### **Residence**

All doctoral candidates will be required to engage in six or more quarters of full-time resident study. Full-time resident study consists of enrollment in one or more courses during a quarter. Three of these full-time resident quarters must be taken consecutively.

Continuous enrollment is required of all doctoral candidates. The student is allowed no more than one year's formal leave of absence during his program. If he is compelled to extend his leave, he must withdraw from the program and apply to the Committee on Graduate Degrees for formal reinstatement when he is ready to proceed.

Candidates for the Ed.D. degree are allowed a period of time not to exceed four years from the beginning of course work to advancement to candidacy, and four additional years from advancement to candidacy to completion of the dissertation. Petitions for extension of time must be approved by the candidate's sponsor and by the Committee on Graduate Degrees.

### **Qualifying Examinations**

When the candidate has completed the course work recommended by his chairman, he applies for the written qualifying examinations in his major and minor fields. The examinations are given under the direction of the Committee on Graduate Degrees of the Graduate School of Education.

Upon successful completion of the written qualifying examinations, the candidate formulates a dissertation proposal with the aid of his chairman and a dissertation committee. The committee consists of three faculty members in Education and one each from two related departments and is nominated by the candidate's chairman and appointed by the Dean of the Graduate Division. The dissertation committee conducts an oral examination covering his research plan and the candidate's qualifications to conduct meaningful research in the field.

### **Advancement to Candidacy**

The candidate who has passed both the written and oral qualifying examinations files an application for advancement to candidacy. Thereafter he enrolls each quarter in Education 599, or for such course/courses as his chairman may direct, or until the dissertation is completed.

### **Dissertation**

The dissertation embodies the results of the candidate's independent work. It must constitute a professional contribution to education. In preparing the dissertation, the candidate is guided by his dissertation committee. Approval of the dissertation by the committee and the Graduate Council is required before he is recommended for the degree.

A manual of instruction for the preparation and submission of the dissertation may be secured from the Graduate Division or from the Office of the University Archivist. The manuscript adviser in the Office of the University Archivist must approve the format of each dissertation before it is accepted by the Graduate Division. Before preparing the final document, candidates are urged to attend an orientation meeting conducted by the manuscript adviser in the Office of the University Archivist. Meetings are held during the second week of classes each quarter.\*

Two official Library copies of the dissertation must be submitted to the Graduate Division on or before the date listed in the UCLA GENERAL CATALOG. A third copy must be submitted to the Office of the Dean of the Graduate School of Education, to be bound at the student's expense.

### **Final Examination**

The candidate's final examination is conducted by his dissertation committee. It is oral, and consists of a defense of the dissertation. Admission to the final examination is restricted to committee members, members of the Academic Senate, and guests of equivalent academic rank from other institutions. The outcome of the final examination is reported to the Graduate Division.

\* For additional information, consult an adviser in the Office of Student Services in the Graduate School of Education.

### **Check List and Advising**

A check list indicating step-by-step progress in the program is available from the graduate adviser in the Office of Student Services. Advice on initial course selection, faculty members to be consulted, forms to be filed at various stages, information on fellowships and subsidies, and general advising may be requested.

### **Doctor of Philosophy in Education**

The Doctor of Philosophy degree in Education is designed to provide preparation for a career of scholarly research in a field of Education. It emphasizes preparation both in a cognate field and in Education, and requires a theoretical dissertation encompassing both fields.

After adequate work to establish an academic record, the candidate's qualifications for admission to the program are presented to the Committee on Graduate Degrees. To be admitted, the student must: (1) have completed a master's degree or the equivalent in either Education or in the cognate field in which the student proposes to work; (2) have passed such examinations as may be specified by the Committee on Graduate Degrees; (3) have maintained at least a 3.0 grade point average in all work completed since the bachelor's degree, including that at UCLA; (4) have secured agreement of a resident graduate faculty member of the Department of Education to serve as sponsor and chairman of his dissertation committee; (5) be recommended for admission by at least two additional resident graduate faculty members of the Department of Education, with whom ordinarily he will have had course work; (6) present evidence of acceptance by the proposed cognate department (in which the Ph.D. is offered); and (7) state the foreign language in which he plans to take an examination.

### **Amount and Distribution of Work**

The candidate will be expected to have a baccalaureate degree in a cognate field and a background (as demonstrated by a Master of Arts degree, a qualifying examination or a program of courses in education and in his cognate department) which prepares him for advanced study in his field of specialization. If any aspect of such preparation (in education or his cognate department) is lacking, the student will engage in studies to achieve the requisite background. The candidate will, thereafter, take courses which develop in depth a knowledge of theories and research methods both in Education and in the cognate field. Stress will be on seminars and independent study. His program will be determined by his chairman in cooperation with the cognate department.

### **Residence**

All doctoral candidates will be required to engage in six or more quarters of full-time resident study. Full-time resident study consists of enrollment in one or more courses during a quarter. Three of these full-time resident quarters must be taken consecutively.

Continuous enrollment is required of all doctoral candidates. The student is allowed no more than one year's formal leave of absence during his program.

If he is compelled to extend his leave, he must withdraw from the program and apply to the Committee on Graduate Degrees for formal reinstatement when he is ready to proceed.

Candidates for the Ph.D. degree are allowed a period of time not to exceed four years from the beginning of course work to advancement to candidacy, and four additional years from advancement to candidacy to completion of the dissertation. Petitions for extension of time must be approved by the candidate's sponsor and by the Committee on Graduate Degrees.

### **Qualifying Examinations**

When the candidate has completed the course work recommended by his guidance committee, he applies for the written qualifying examinations in his field in education and in his cognate department. The examinations are given under the direction of the Committee on Graduate Degrees of the School of Education.

Upon successful completion of the written qualifying examinations, the candidate formulates a dissertation proposal with the aid of his chairman and a dissertation committee. The committee consists of three members of the faculty in education, two in the cognate department, and one from the University at large. The committee is nominated by the Department of Education and appointed by the Dean of the Graduate Division. The dissertation committee conducts an oral examination on topics from both education and the cognate discipline related to the candidate's research proposal, designed to determine the candidate's qualifications to conduct meaningful research in the field.

### **Advancement to Candidacy**

The candidate who has passed both the written and oral qualifying examinations, as well as the language examination, files an application for advancement to candidacy. Thereafter he enrolls each quarter in Education 599, or for such course/courses as his chairman may direct, or until the dissertation is completed.

### **Dissertation**

The dissertation embodies the results of the candidate's independent investigation. It must contribute to the body of theoretical knowledge in education, and must draw upon the interrelations of education and the cognate discipline. In preparing the dissertation, the candidate is guided by his dissertation committee. Approval of the dissertation by the committee and the Graduate Council is required before he is recommended for the degree.

A manual of instruction for the preparation and submission of the dissertation may be secured from the Graduate Division or from the Office of the University Archivist. The manuscript adviser in the Office of the University Archivist must approve the format of each dissertation before it is accepted by the Graduate Division. Before preparing the final document, candidates are urged to attend an orientation meeting conducted by the manuscript adviser in the Office of the University Archivist. Meetings are held during the second week of classes each quarter.\*

\* For additional information, consult an adviser in the Office of Student Services in the Graduate School of Education.

Two official Library copies of the dissertation must be submitted to the Graduate Division on or before the date listed in the UCLA GENERAL CATALOG. A third copy, to be bound at the student's expense, must be submitted to the Office of the Dean, Graduate School of Education.

### **Final Examination**

The candidate must pass a final oral examination conducted by his dissertation committee, the major emphasis of which will be on defense of the dissertation. Admission to the final examination is restricted to committee members, members of the Academic Senate, and guests of equivalent academic rank from other institutions.

### **Check List and Advising**

A check list indicating step-by-step progress in the program is available from the graduate adviser in the Office of Student Services. Advice on initial course selection, faculty members to be consulted, forms to be filed at various stages, information on fellowships and subsidies, and general advising may be requested.

## **SCHOOL OF ENGINEERING AND APPLIED SCIENCE**

The School of Engineering and Applied Science, established in the academic year 1968-69, is the outgrowth of the College of Engineering.

The educational program of the School of Engineering and Applied Science is comprised of three parts:

**Part I** is the two year pre-engineering curriculum which, for University of California students, is completed in the College of Letters and Science.

**Part II** is the two year Bachelor of Science degree program to which students are accepted upon completion of Part I.

**Part III** is the graduate program which may terminate with the Master of Science degree or may be extended to the degree of Doctor of Philosophy for qualified students.

The pre-engineering curriculum of Part I consists primarily of instruction in mathematics, the basic physical sciences, social sciences, and humanities. Transfer to the School of Engineering and Applied Science will not in the future be restricted only to those students with lower division preparation in pre-engineering subjects. Rather, it is expected that many students will find the transfer greatly facilitated.

The Bachelor's degree program is designed to give each student a thorough grounding in the fundamentals of engineering, mathematics and the applied sciences which are relevant to all branches of engineering and thus provide a permanently useful core of knowledge. Provision is made for a limited amount of specialization through elective courses in a major field. The core courses together with the major electives thus provide a base for the more advanced and specialized curriculum at the Master's degree level.

## Admission Requirements

Applicants for admission to the School of Engineering and Applied Science should have completed 23 courses in good standing, including the following minimum subject requirements:

1. Three courses in chemistry, equivalent to UCLA's Chemistry 1A-1B-1C; 2. six courses in mathematics, equivalent to UCLA's Mathematics 11A-11B-11C and 12A-12B-12C; 3. four courses in physics, equivalent to UCLA's Physics 7A-7B-7C-7D.

Students transferring to the School from institutions which offer instruction in engineering subjects in the first two years, in particular, California public junior colleges, will be given credit for certain of the requirements of Part II. Details regarding transfer of such credit are published in the ANNOUNCEMENT OF THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE.

Students who wish to enter the school at the graduate level are referred to page 29 of this bulletin and to the ANNOUNCEMENT OF THE GRADUATE DIVISION.

## The Engineering and Applied Science Curriculum (55 Courses, 220 Units)

### Part I. Pre-Engineering. Lower Division in the College of Letters and Science (23 Courses, 92 Units)

(See page 258)

	<i>Units First Quarter</i>	<i>Units Second Quarter</i>	<i>Units Third Quarter</i>
<b>Freshman Year</b>			
Chemistry 1A-1B-1C .....	4	4	4
Mathematics 11A-11B-11C .....	4	4	4
Physics 7A-7B .....	—	4	4
English 1 .....	4†	—	—
Electives* .....	—	4	4
	—	—	—
	12	16	16
<b>Sophomore Year</b>			
Mathematics 12A-12B-12C .....	4	4	4
Physics 7C-7D .....	4	4	—
Engineering 10 .....	4†	—	—
Electives* .....	4	8	12
	—	—	—
	16	16	16

\* The elective courses shall include the following: one course in the life sciences; four courses in the humanities, social science, and/or fine arts. Three courses may be free electives. The free electives may be postponed until the third or fourth year for those students who may wish to take certain junior engineering courses for which they have the prerequisites.

† These courses may be deferred to a later quarter.

**Part II. Upper Division in the School of Engineering and Applied Science (23 Courses, 92 Units)**

Prerequisite for junior status: admission to the School of Engineering and Applied Science and satisfactory completion of the minimum subject requirements specified on page 124.

**CORE COURSE REQUIREMENT**

Engineering 100L—Circuit Analysis .....	6 units
Engineering 100B—Electromagnetics .....	4 units
Engineering 100D—Information Processing Systems .....	4 units
Engineering 101A—Engineering Analysis .....	4 units
Engineering 102A—Engineering Dynamics .....	4 units
Engineering 103A—Elementary Fluid Mechanics .....	4 units
Engineering 105A—Engineering Thermodynamics .....	4 units
Engineering 105D—Transport Phenomena .....	4 units
Engineering 107L—Introduction to Science of Materials .....	6 units
Engineering 108—Introduction to Solid Mechanics .....	4 units

**SUGGESTED PROGRAM**

The student should consult his adviser to plan the detailed program.

	<i>Units First Quarter</i>	<i>Units Second Quarter</i>	<i>Units Third Quarter</i>
<b>Junior Year*</b>			
Core Courses .....	10	10	8
Major Field and/or Mathematics Electives† ..	—	4	4
Humanities Electives† .....	4	—	4
	—	—	—
	14	14	16
<b>Senior Year</b>			
Core Courses .....	8	8	—
Major Field and/or Mathematics Electives† ..	8	8	12
Humanities Elective† .....	—	—	4
	—	—	—
	16	16	16

*Transfer Credit for Community College Transfer Students.* A sophomore course in Circuit Analysis will satisfy the four-unit requirement, Engineering 100. Students should take Engineering 100L to satisfy the remaining two units.

\* Engineering 101A should be taken in the first quarter of the junior year; Engineering 107 and 107L should be taken in the junior year.

† The upper division elective courses shall include the following: 1. Two courses in mathematics, chosen from the approved list; 2. three courses in the humanities, which may include social sciences and the fine arts; 3. seven courses in the major field.



A sophomore sequence in Statics and Strength of Materials will satisfy the requirement, Engineering 108. A course in statics will satisfy part of the Engineering 108 requirement; students may take course 108A to fulfill the remainder of the requirement.

A sophomore course in properties of materials will satisfy four units of the six-unit requirement, Engineering 107-107L. Provision will be made for satisfaction of the remaining two units.

Appropriate technical electives shall be taken in place of the units thus released by any of the above.

Students enrolled in engineering programs in community colleges prior to the establishment of the School of Engineering and Applied Science shall have the option of completing the curriculum of the College of Engineering.

### **Part III. First Graduate Year in the School of Engineering and Applied Science (Nine Courses, 36 Units, and a thesis or comprehensive examination)**

Prerequisite for graduate status: admission to the Graduate Division (see page 29).

Students beginning the work of Part III of the five-year curriculum are required to qualify for admission to the Graduate Division.

At least nine courses and a thesis or comprehensive examination are required. The courses must be graduate or upper-division undergraduate work not required for the Bachelor's degree. A majority of the total course requirement, both graduate and upper division undergraduate work, must consist of courses in Engineering. The student is alerted to the possibility that some of these courses may be in the humanities, social sciences or fine arts.

*Thesis Plan.* At least five of the nine courses must be strictly graduate work. Two of the five graduate courses may be individual study courses involving work on the student's thesis. This option normally is the one followed by students planning to continue for the Ph.D. degree.

*Comprehensive Examination Plan.* Five of the nine courses must be strictly graduate courses in the major subject. A comprehensive examination in the major subject is required.

*Constraints on the electives of Parts II and III.* The electives shall include:

1. The equivalent of at least a one-course experience in design, to be satisfied by one course or by parts of not more than two courses in the 100 or 200 series.
2. One course in economics chosen from an approved list of courses given in the Economics and Engineering Departments in the 100 series.
3. One course in the 100, 200, or 596 series dealing primarily with engineering and science in society.
4. The equivalent of at least one course in laboratory, to be satisfied either by a full laboratory course or two courses that include laboratory.
5. At least two courses in a senior level (104CD) or graduate level (598) individual or group project or thesis project.

Students obtaining only the Bachelor of Science degree must satisfy Parts I and II above and elective constraints 1, 2, and 3. Also, of the seven sociohumanistic

elective courses required under Parts I and II, at least three courses must be in the same academic department or must otherwise reflect coherence in respect to subject matter. In the latter group, upper division courses should predominate.

The curricular requirements for the Bachelor of Science degree consist of Parts I and II, electives constraints 1, 2 and 3; the University requirement in American History and Institutions and the senior residence requirement.

Students admitted to the Master of Science program from other institutions or departments will be required to satisfy only Part III, Master of Science degree requirements, and need not satisfy the elective constraints.

## GENERAL INFORMATION

**Honors.** Students who have achieved scholastic distinction in upper division studies will be awarded the Bachelor's degree with the appropriate honors designation: *Cum Laude*, *Magna Cum Laude*, or *Summa Cum Laude*.

**R.O.T.C. Programs.** Students who enroll in one of the three Reserve Officer Training Corps programs offered at UCLA will find it necessary to extend their period of study to accommodate the requirements of the military departments. Students may not substitute required military science courses for required courses in the Engineering and Applied Science Curriculum; however, the three free electives of Part I may be used for this purpose.

**Advising.** It is mandatory for all freshmen entering the pre-engineering program to have their courses of study approved by an Engineering Department adviser. After the first quarter, curricular and career advising may be accomplished on an informal basis. Students in Part II of the curriculum will be assigned to an adviser and must have their programs approved each quarter.

**Transfer from a Technical Institute.** A student who wishes to transfer to the School of Engineering and Applied Science from a technical institute or junior college technical education program will be expected to meet the University requirements for admission. Upon consultation with a faculty counselor, he will be placed in courses at a level deemed appropriate. After he has established a satisfactory University record, the School may recommend transfer credit for his previous work to the extent it has been found to have served as preparation for the University work undertaken.

**Passed/Not Passed.** Engineering undergraduate students may take one course per quarter on a Passed/Not Passed basis if the following conditions are met:

1. The student is in good standing, i.e., not on probation.
2. The student is enrolled in at least 3½ courses for the quarter including the courses taken on a Passed/Not Passed basis.
3. The course taken on a Passed/Not Passed basis is not listed as a required course in the Engineering and Applied Science Curriculum as published in this catalog.

**Evening Information Center.** The School of Engineering and Applied Science maintains in Boelter Hall an Evening Information Center which is open from 5 to 10 p.m. Monday through Thursday, and from 9 a.m. to 12 noon on Saturdays, throughout the year except for the month of August.

**Library Facilities.** A branch of the campus library is housed within the complex of engineering buildings. Known as the Engineering-Mathematical Sciences Library, it serves the departments of Engineering, Mathematics, Astronomy, and Meteorology. Open stacks encourage students to explore and use specialized literature.

**Student Activities.** The abundance and variety of extracurricular activities at UCLA provide many opportunities for valuable experiences in leadership, service, recreation, and personal satisfaction. The Faculty of the School strongly encourages students to participate in such activities, especially those of most relevance to engineering. Among the latter are the student engineering societies such as the Engineering Society, University of California and Engineering Graduate Student Association; the student publications, and the student-oriented programs of the many technical and professional engineering societies in the Los Angeles area. The UCLA chapter of *Tau Beta Pi*, the national engineering honor society, encourages high scholarship, provides volunteer tutors, and offers many services and programs "to foster a spirit of liberal culture in engineering colleges."

### **Graduate Study in Engineering**

The School of Engineering and Applied Science offers graduate study and research in many areas of engineering leading to the following degrees: The M.S. in Engineering; the M.S. in Computer Science; the professional degree, M.Engr. (Master of Engineering); and the research degrees, Ph.D. in Engineering, Ph.D. in Computer Science. The School is comprised of the departments listed below which serve as centers of activity:

#### **COMPUTER SCIENCE**

*Chairman, M. A. Melkanoff, 3714 Boelter Hall, telephone: 825-2212 or 825-2778*

The School of Engineering and Applied Science, through its Computer Science Department, offers M.S. and Ph.D. degrees in Computer Science as well as major and minor fields for graduate students seeking Engineering degrees. The program includes five basic areas:

**Theory.** Theoretical models in computer science; automata theory; formal grammars; computability and decidability; pattern recognition; automatic deduction; queueing theory.

**Methodology.** Simulation; information storage and retrieval; file management; numerical analysis; optimization; analog and hybrid computers.

**System Design.** Computer system architecture; digital systems; logic design; memory, arithmetic, control, data transmission and input-output systems design; computer graphics.

**Programming: Languages and Systems.** General and special purpose programming languages; compilers; system programming; syntax, semantics and pragmatics of programming languages.

**Applications.** Symbol manipulations; management information systems; artificial intelligence; interactive systems, etc.

**ELECTRICAL SCIENCES AND ENGINEERING**

*Chairman, F. G. Allen, 7732B, Boelter Hall, telephone: 825-2647*

The courses and research in this department cover five specialty areas:

*Electric Circuits.* Both active and passive circuits—theory, analysis and synthesis.

*Solid State Electronics.* Quantum electronics, semiconductors, electronic properties of matter, and the application of these to the investigation of solid state devices.

*Electromagnetics.* Study of the interaction of electromagnetic waves with complex media, antennas and microwave components, scattering and diffraction theory, moving media, modern optics, electromagnetic and acoustic waves interaction, magnetic and dielectric properties of matter.

*Applied Electronics.* Investigation and characterization of modern electronic devices, including solid state devices and lasers, when used as elements in instrumentation and communication systems.

*Applied Plasma Physics.* The practical aspects of plasma physics, including plasma production, confinement, and heating; suppression of instabilities; and generation, propagation, and interaction of electromagnetic and plasma waves.

**ENERGY AND KINETICS**

*Chairman, E. L. Knuth, 5531K Boelter Hall, telephone: 825-5423 or 825-2046*

*Chemical-Engineering Kinetics and Electrochemistry.* Kinetics (including catalysis and electrode kinetics), electrochemistry, adsorption, transport properties, combustion, flow through porous media, and separation operations.

*Heat and Mass Transfer.* Convection, radiation, conduction, evaporation, condensation, boiling, two-phase flow, chemically reacting and radiating flow, transport processes in turbulent flow, instability and convection under the action of external fields, aerodynamic heating, and reactive flow in porous media.

*Molecular Dynamics.* Molecular-molecule collisions, molecule-surface collisions, low-density free jets, relaxation processes in gases, adsorption processes at solid surfaces, intermolecular potentials, molecular-beam technology, and sampling using molecular-beam techniques.

*Nuclear Engineering.* Neutron transport; nuclear-reactor kinetics, dynamics, materials, and safety.

*Thermodynamics.* Statistical, chemical, and non-equilibrium thermodynamics; cryogenics; magnetic and low-temperature phase transitions; thermodynamics of imperfect gases; superfluid heat transport; and transport properties of condensed quantum systems.

Applications include batteries, fuel cells, air-pollution control, sea-water desalination, atmospheric entry, propulsion, space vehicle temperature control, enclosures with human occupants, and fast nuclear reactors.

**ENGINEERING SYSTEMS**

*Acting Chairman, M. F. Rubinstein, 7619 Boelter Hall, telephone 825-2804.*

Theory and methodology of systems engineering including control engineer-

ing, system dynamics, operations research, economic evaluation and optimization in relation to the broader problems of the design and management of engineering projects.

Programs dealing with the conservation and utilization of natural and human resources. Ongoing efforts in biotechnology, water resources, air resource, ecological and environmental systems, geoengineering, sanitary engineering, traffic and transportation, ocean engineering, aerospace vehicle systems, production systems, nuclear reactor systems, and the resource aspects of urban and regional planning.

## **MATERIALS**

*Chairman, A. S. Tetelman, 6531K Boelter Hall, telephone: 825-5664*

Phase transformation in solids; electron microscopy; materials synthesis, vacuum metallurgy, structure property relationships; electrochemical machining; theoretical metallurgy; phase transformations in solids; oxidation kinetics; mechanical properties of oxides; heat treatment of steel; fracture of weld metal; phase transformations in solids; high pressure effects on solids; thermodynamics and strength of ceramic solids; applications of ceramics; glass science, ceramics, and electrical properties of amorphous materials; X-ray diffraction; mechanical properties of materials; irradiation effects on structural materials; strengthening mechanism in solids; electronic and thermal properties of solids; mechanics of extrusion, forging and rolling; high temperature and fatigue fracture; elasticity of crystals and crystal defects; fracture of steels and composite materials; joining of materials; magnetic properties of solids; boundary layer studies; solidification science, crystal growth, casting, and modern foundry practice.

## **MECHANICS AND STRUCTURES**

*Acting Chairman, R. A. Westman, 5732D Boelter Hall, telephone: 825-2281*

*Dynamics.* Rigid body dynamics, kinematics and mechanisms; celestial mechanics as applied to orbit theory, perturbations, observations and prediction; vehicle dynamics in relation to the problem of attitude, optimum trajectories, navigation and space technology.

*Fluids.* Mechanics of fluids, aerodynamics, aircraft stability, control and performance, aeroelasticity, aeroacoustics, hypersonics, hydrodynamics, laminar and turbulent flow, hydrodynamic stability, wave motion, rarefied gasdynamics, engineering magnetohydrodynamics, bio-fluid mechanics.

*Solids.* Elasticity, viscoelasticity, plasticity, micro-mechanics, wave propagation in solids, continuum mechanics, theory of plates and shells, fracture mechanics, vibration theory, bio-mechanics.

*Structures.* Design and analysis of engineering structures under static and dynamic loads, optimization, elastic and inelastic stability, failure phenomena; matrix, relaxation, recursion methods related to beams, frames, plates and shells; reinforced concrete, experimental techniques; dynamic analysis, random excitation; earthquake engineering, theoretical and experimental soil mechanics, foundations and soil interaction.

**SYSTEM SCIENCE**

*Chairman, A. V. Balakrishnan, 4532B Boelter Hall, telephone: 825-2180*  
*Control, Information, and Systems.* Theory and applications.

*Automata Theory.* Finite-state machines, formal languages, computational complexity, applied logic and theory of computing.

*Communications Systems.* Information theory, source and channel coding (block and convolutional), signal detection, estimation and filtering, data compression, optical communication.

*Control Systems.* Optimal control and computing techniques, identification and adaptivity, stochastic control, differential and N-person games, interactive control and team theory, distributed systems, applications to aerospace systems, biomedical, process control and thermonuclear fusion.

*System Optimization and Numerical Techniques.* Continuous-state system theory and optimization; large-dimensional dynamic systems; pattern recognition and classification; networks and graphs, network flow problems, queuing systems; analysis of public and civic systems.

Graduate students in Engineering are encouraged to supplement their programs with appropriate offerings from the departments of Biology, Business Administration, Chemistry, Geology, Mathematics, Meteorology, Physics, Physiology, Zoology, or other fields closely allied to Engineering.

Engineering graduate students must meet the minimum residence requirements of the University.

Graduate students with advanced degree objectives in Engineering or Computer Science are subject to the following time limitations:

A graduate student is expected to complete the requirements for the master's degree within three calendar years after being admitted to graduate status in the School of Engineering and Applied Science.

The Ph.D. student who already has a master's degree will be expected to complete the field requirements and the language requirement within two calendar years from the time he is admitted to the Ph.D. program and to complete the remaining requirements for the Ph.D. degree within an additional two calendar years.

The Ph.D. student who does not already have a master's degree will be expected to complete the field requirements and the language requirement within five calendar years from the time he is admitted to the Ph.D. program and to complete the remaining requirements for the Ph.D. degree within an additional two calendar years.

**REQUIREMENTS FOR ADMISSION TO GRADUATE STATUS**

Applications for admission from graduates of recognized colleges and universities will be considered. The basis of selection is promise of success in the work proposed, which is judged largely on previous college record. Before admission is approved, an application for Engineering graduate study will be referred by the Dean of the Graduate Division to the School of Engineering and Applied Science for recommendation. Final approval is granted by the Graduate Division.

In addition to meeting the requirements of the Graduate Division, the entering student will normally be expected to have completed the requirements for the bachelor's degree with an undergraduate scholarship record equivalent at least to a 3.0 grade average (based on 4.0 maximum) for all course work taken in the junior and senior years. An applicant who fails to meet these requirements must complete additional course work before being admitted to graduate status. These additional courses will not be accepted as part of the course requirement for the master's degree.

Admission to the Ph.D. program normally is based on a minimum grade average of 3.25 (based on a 4.00 maximum) at the master's level, evidence of creative ability, and strong supporting letters from cognizant faculty.

In addition to filing an application for admission with the Graduate Division, prospective students are required to file a special application for admission with the School of Engineering and Applied Science. These supplements may be secured by writing to the Assistant Dean for Graduate Studies, School of Engineering and Applied Science.

### **GRADUATE RECORD EXAMINATION**

Each applicant who has received his schooling outside the United States is required to take the Advanced Test of the Graduate Record Examination in the subject in which he majored for the bachelor's degree or equivalent. The test is given in foreign countries.

Applications for the Graduate Record Examination may be secured by applying to the Educational Testing Service, 1947 Center Street, Berkeley, California 94704 (for those living in the western hemisphere) and to the Educational Testing Service, Box 955, Princeton, New Jersey 08540 (for those living in the eastern hemisphere).

The Testing Service must be requested to forward the test results to the Assistant Dean for Graduate Studies, School of Engineering and Applied Science.

There is a fee of \$14 for the Advanced Test.

### **REQUIREMENTS FOR THE DEGREES**

#### **MASTER OF SCIENCE IN ENGINEERING**

#### **MASTER OF SCIENCE IN COMPUTER SCIENCE**

Students will meet the requirements by satisfactorily completing appropriate courses chosen in accordance with a plan prepared in conference with a graduate engineering adviser and approved by the School. A majority of the total course requirement, both graduate and upper division undergraduate work, must consist of courses in engineering (for the M.S. in Engineering) or computer science (for the M.S. in Computer Science). Additionally, students seeking a graduate degree in Computer Science must demonstrate competence in the Computer Science core program. The student may wish also to complete certain analytical and professional courses on other campuses of the University of California. The fields of study established towards the M. S. degree are as follows:\*

\* Any student is free to propose to the School any other field of study with the support of his adviser.

**COMPUTER SCIENCE DEPARTMENT**

Computer Theory  
Computer Methodology  
Computer System Architecture  
Computer Programming: Languages and Systems  
Computer Applications

**ELECTRICAL SCIENCES AND ENGINEERING DEPARTMENT**

Applied Electronics  
Electric Circuits  
Electromagnetics  
Solid State Electronics

**ENERGY AND KINETICS DEPARTMENT**

Aerothermochemistry  
Chemical Engineering and Applied Chemistry  
Mechanical and Aerospace Engineering Thermophysics  
Nuclear Science and Engineering  
Thermodynamics

**ENGINEERING SYSTEMS DEPARTMENT**

Biotechnology  
Dynamics and Control of Engineering Systems  
Large Scale Systems/Operations Research  
Transportation Systems  
Urban Systems  
Water Resources

**MATERIALS DEPARTMENT**

Ceramics and Ceramic Processing  
Metallurgy and Metal Processing  
Science of Materials

**MECHANICS AND STRUCTURES DEPARTMENT**

Astrodynamics  
Continuum Mechanics  
Dynamics  
Earthquake Engineering  
Fluid Mechanics  
Soil Mechanics  
Solid Mechanics  
Structural Design  
Structural Mechanics

**SYSTEM SCIENCE DEPARTMENT**

Automata  
Control Systems  
Communications Systems  
Queueing and Network Flow  
System Optimization



## **REQUIREMENTS FOR THE DEGREE OF MASTER OF ENGINEERING**

The requirements for the Master of Engineering degree may be satisfied by completion of the Engineering Executive Program. A limited number of graduate students is selected to enroll in this program at the beginning of each Fall Quarter.

The Engineering Executive Program is a two-year work-study program designed for those engineers who will fill high-level executive positions in industry and government within the next decade. It consists of sequences of graduate-level professional courses (of the 400-series) covering significant aspects and new concepts in management of technological enterprises.

To be considered for the program, applicants must qualify for regular graduate status in engineering at UCLA. They must have had five years of responsible full-time professional experience in engineering and must have completed some formal study in statistics. Every applicant who meets these requirements will be interviewed by a panel of faculty members. Approximately thirty-five of the applicants will be selected to enter the program. Criteria for selection are educational background, professional experience and potential for a managerial career.

A new group of students is admitted to the Program each fall. They form a class and remain together for two years, taking the same courses and participating in writing two or more group reports. Classes meet between 3:00 and 9:30 p.m. one day a week during the fall, winter, and spring quarters. Special individual and group problems are assigned for the summer quarters.

Applications, including official transcripts of college records, must be received by the UCLA Graduate Division by March 15. There is a fee of \$275 each quarter. Further information may be obtained from the Office of the Engineering Executive Program, School of Engineering and Applied Science, UCLA, Los Angeles, California 90024. The office is located in Boelter Hall 6288. The telephone number is (213) 825-4628 or 825-4471.

## **REQUIREMENTS FOR THE DEGREES**

### **DOCTOR OF PHILOSOPHY IN ENGINEERING**

### **DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE**

The following information supplements the general requirements of the Graduate Division.

A student who expects to complete all the requirements for the M.S. degree at UCLA during the current quarter and who desires to proceed toward the Ph.D. degree is required to file Form 1, Notice of Intention to Proceed to Candidacy for the Degree Doctor of Philosophy, by the end of the current quarter. Approval of the Assistant Dean for Graduate Studies in Engineering and Applied Science is needed. This approval is normally based on a minimum grade average of 3.25 at the master's level, evidence of creative ability, and strong supporting letters from cognizant faculty.

Students with master's degrees from other institutions, and who have been admitted to the Ph.D. program by the Graduate Division, are required to file Form 1 as early in their program as feasible. Approval by the Assistant Dean is pro forma.

The basic program of study toward the Ph.D. degree in Engineering or Computer Science is built around one major field and two minor fields. The established fields of study are as follows:

**COMPUTER SCIENCE DEPARTMENT**

Computer Theory  
Computer Methodology  
Computer Systems Architecture  
Computer Programming: Languages and Systems  
Computer Applications

**ELECTRICAL SCIENCES AND ENGINEERING DEPARTMENT**

Applied Electronics  
Electric Circuits  
Electromagnetics  
\*Quantum Mechanics  
Solid State Electronics  
\*Spectroscopy

**ENERGY AND KINETICS DEPARTMENT**

Electrochemical Engineering and Applied Electrochemistry  
Heat and Mass Transfer  
Molecular Dynamics  
Nuclear Science and Engineering  
\*Nuclear Reactor Control  
\*Radiation Biology, Health Physics, and Dosimetry  
Thermodynamics

**ENGINEERING SYSTEMS DEPARTMENT**

Biotechnology  
Dynamics and Control of Engineering Systems  
Large Scale Engineering Systems  
Operations Research/Large Scale Engineering Systems  
Water Systems Engineering

**MATERIALS DEPARTMENT**

Ceramic and Ceramic Processing  
Metallurgy and Metal Processing  
Science of Materials

**MECHANICS AND STRUCTURE DEPARTMENT**

Deformable Solids  
Dynamics  
Fluid Mechanics  
Soil Mechanics  
Structures

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\* Established Minor Field Only.

**SYSTEMS SCIENCE DEPARTMENT**

Automata and Formal Languages  
 Communication Systems  
 Control Systems  
 Mathematical Theory of Systems  
 System Optimization  
 School-wide Field  
 \*Applied Mathematics

However, the School feels that many significant contributions have arisen and will continue to emerge from a reorientation of existing knowledge and, therefore, that no classification scheme can be considered as unique. Thus prospective Ph.D. candidates will be allowed, and in certain cases encouraged, to undertake (as fields of study) areas which have been previously undefined. Approval of a Ph.D. program is based upon the set of fields considered as a whole and is granted by the Assistant Dean for Graduate Studies.

The requirements for a particular field generally may vary with the student's particular objective, although minimum requirements exist for each field. Ordinarily, the student will engage both in formal course study and in individual study in meeting the field requirements.

While the emphasis in a Ph.D. program is on the ability to correlate knowledge, rather than on the mere satisfaction of course requirements, the extent of a properly chosen field of study is such that the competent student will be able to complete the three field requirements in two years of full-time graduate study or the equivalent.

In general, students in the School of Engineering and Applied Science must earn the M.S. degree before the Assistant Dean for Graduate Studies will consider a proposal for a Ph.D. program. However, the course work leading to the M.S. degree will, if selected properly, aid in meeting the field requirements.

With the aid of his graduate adviser, the student is directed to the faculty members representing the standing committee on the respective fields for the current year or to faculty members who are willing to guide the student in nonestablished fields. After consulting with members of the committees regarding his program of study for his particular fields, the student submits his proposed program of study to the Assistant Dean for Graduate Studies for approval.

**PRELIMINARY EXAMINATIONS**

After completing the major field (which includes a written examination normally eight hours long) and the minor field requirements outlined by the members of the field committees, in any order the candidate and his adviser determine, the candidate should schedule a two-hour oral examination covering all three fields. The oral examination should occur within a four-week period following the completion of the last of the field requirements.

\* Established Minor Field only.

**FOREIGN LANGUAGE**

Recent curriculum changes have removed the foreign language requirement from the Ph.D. program in the School of Engineering and Applied Science. Reference to the Ph.D. language requirement which appears on page 132 and below is no longer applicable.

**QUALIFYING EXAMINATION**

After the student has demonstrated his competence in the three fields and has fulfilled the language requirement, the Assistant Dean for Graduate Studies will notify the Graduate Division of his readiness for the qualifying examination and will recommend the committee for this examination, generally as follows: faculty member directing research, chairman; two additional faculty members from engineering or computer science as appropriate; two faculty members from related fields in the University of California but outside the School of Engineering and Applied Science.

The details of the qualifying examination are at the discretion of the committee, but ordinarily will center around a broad inquiry into the student's preparation for research. The qualifying examination is oral, the preliminary examinations usually constituting the written portion as required by the Graduate Division.

**DISSERTATION**

The candidate shall prepare his dissertation in accordance with the instructions furnished by the Student and Academic Affairs Section of the Graduate Division. The orientation meetings on the format of theses and dissertations are scheduled for the beginning of each quarter in the calendar in the STANDARDS AND PROCEDURES FOR GRADUATE STUDY AT UCLA. For additional information and assistance in the preparation and submission of the final copies of the manuscript, consult the Manuscript Adviser for Theses and Dissertations, Office of the University Archivist, Powell Library.

**CONTINUING ENGINEERING STUDIES**

Continuing education of the practicing engineer is a growing concern of the profession. Engineering/Physical Sciences Extension brings to this field the structure and facilities of the statewide University of California Extension organization. Extensive programs of evening classes, conferences, concentrated short courses, correspondence work, sequential certificate plans and special events are constantly available. Restudy, updating and addition of new and timely subject matter characterize the continuing education program and keep it quickly responsive to developing technology and changing professional needs. For further information, please call Engineering/Physical Sciences Extension, 825-3985.

**SCHOOL OF LAW**

Applicants for admission to the School of Law must have a bachelor's degree from an accredited institution and must have taken the Law School Admission

Test. The application for admission to the School of Law must be made on forms supplied by the Admissions and Records Office, School of Law, University of California, Los Angeles, California 90024, and transcripts of all college, university, and professional school records, including the records of work completed on the Los Angeles campus of the University of California, must be sent from the institutions of origin to the Admissions and Records Office, School of Law, University of California, Los Angeles, California 90024. If the applicant is currently enrolled in a college or university, the transcripts should cover all work completed to date, including a statement showing work in progress. The transcripts should be accompanied by a statement indicating the date on which it is expected the work in progress will be completed, and the necessary supplementary transcripts should be sent to the School of Law.

The Educational Testing Service will supply each applicant with a bulletin of information concerning the Law School Admission Test. For permission to take the Law School Admission Test, applicants should write directly to the Educational Testing Service, Box 944, Princeton, New Jersey 08540, requesting an application blank and bulletin of information listing places where the test may be taken.

Admission will be on a competitive basis. Applications for admission to the first-year class together with all transcripts and Law School Admission Test Scores must be received by April 15. Applicants for admission with advanced standing may file applications until August 15.

Official notice of admission, or denial of admission, to the first-year class is sent in most cases after May 1. Applicants for advanced standing are notified after August 15.

For further details concerning the program of the School of Law consult the UCLA ANNOUNCEMENT OF THE SCHOOL OF LAW.

## **SCHOOL OF LIBRARY SERVICE**

In December of 1958 the Regents of the University of California authorized the establishment of the School of Library Service on the Los Angeles campus, to begin a course of instruction in September, 1960, leading to the Master of Library Science degree. In January of 1965, a second degree, Master of Science in Information Science (Documentation); was approved and added to the School's program. In 1968 a Post-M.L.S. program, leading to a Certificate of Specialization in Library Science, was also approved.

The M.L.S. degree is accepted in the United States and in many other countries as the basic preparation for professional positions in municipal, county, regional, college, university, school, children's and special library service. The degree is also widely regarded as valuable preparation for careers in literature searching, editing, and in publishing or the book trade. The course of study and preparation for the comprehensive examination normally require four quarters of full-time enrollment. Only under special circumstances are part-time students admitted to the course of study.

The Master of Science degree program is open to persons who hold appropriate B.A. or B.S. degrees in other fields such as one of the physical or biological

sciences, business administration, engineering, or mathematics. The purpose of the degree is to prepare information scientists. The degree program comprises an integrated course of study and research in the theoretical and practical foundations of information handling. The program is an interdisciplinary one with emphasis upon research and general principles. A thesis is required. Four areas of specialization are offered: system integration, usage of information, organization and operation of information activities, and equipment and the design of information services. A reading knowledge of one foreign language is required. The preferred languages are French, German and Russian.

Requirements for admission to the School of Library Service include admission to graduate status by the Graduate Division, an undergraduate course of study appropriate to the degree objective, an acceptable score on the Aptitude Test of the Graduate Record Examination, and a scholastic average accepted by both the Graduate Division and the School of Library Service. Acceptable undergraduate majors and minors are those offered by departments of the College of Letters and Science at UCLA, or the equivalent subjects in other colleges and universities. UCLA has no undergraduate major or minor in librarianship or library science. A special prerequisite for M.L.S. degree candidates is a reading knowledge of one or two modern foreign languages, preferably German, French and Russian; a special prerequisite for M.S.I.S. (Documentation) degree candidates is a background in mathematics through the calculus.

Requirements for admission to the program for Certificates of Specialization in Library Science are: the M.L.S. degree or its equivalent awarded by a school or department accredited by the American Library Association; unconditional admission to graduate status; and such other requirements as are deemed necessary by the School of Library Service for each field of specialization. For information regarding the approved fields of specialization, and the specific requirements for each field, write to the Office of the School of Library Service.

Since the admission of entering students is limited by the available laboratory space and research facilities, selection is on a competitive basis. Candidates are chosen because, in the judgment of the Admissions Committee of the School of Library Service, they have demonstrated a potential of becoming excellent professional librarians or information scientists. Criteria of selection by the Admissions Committee are: (1) recency of formal education; (2) undergraduate and graduate scholarship records; (3) score on the Aptitude Test of the Graduate Record Examination; (4) report of an interview of the applicant by the Dean of the School of Library Service or by a person designated by the Dean to conduct an interview; and (5) letters of recommendation. The Admissions Committee may, if it believes a candidate has an inadequate understanding of the purposes and requirements of modern library service, recommend postponement of admission until the candidate has obtained nonprofessional working experience with a satisfactory performance rating in a reputable library.

Further information concerning entrance requirements, certificate or degree requirements, the California State Credential for School Librarians, age limitations, and exclusions due to physical handicaps may be obtained from the Office of the School of Library Service.

## SCHOOL OF MEDICINE

The School of Medicine on the Los Angeles campus admits 128 students to the freshman class. Applications for the class entering in September, 1971, with all transcripts of record and other necessary documents, must be filed between May 1, 1970, and October 31, 1970, with the Office of Student Affairs, UCLA School of Medicine, Los Angeles, California 90024. Application forms and information may be obtained from that office. Applications must be accompanied by a nonrefundable fee of \$10.

### THE CURRICULUM

In September, 1966, the School of Medicine adopted the quarter system and inaugurated a new four-year curriculum. The freshman year consists of three quarters of basic medical sciences and fundamentals of clinical medicine, followed by a summer quarter of vacation. The second year continues study of basic sciences and clinical medicine. In the second summer quarter the junior year of clinical clerkships begins. Between the junior and senior year the summer quarter is free. The fourth year includes three quarters of electives, e.g., in research training, advanced clinical clerkships, and depth electives which stress the scientific foundation underlying the knowledge of diseases of specific organ systems.

### BASIS OF SELECTION

Candidates will be selected on the basis of the following considerations:

1. Undergraduate and, where applicable, graduate scholarship.
2. Score on the Medical College Admission Test, which is administered for the Association of American Medical Colleges by the Psychological Corporation.
3. Interview of the applicant by a member or members of the Admissions Committee.
4. Evaluation of the applicant's accomplishments and character in letters of recommendation.

The Committee on Admissions will select those candidates who present the best evidence of broad training and high achievement in college, a capacity to develop mature interpersonal relationships, and the traits of personality and character essential to success in medicine. Preference will not be given students who major in natural science, since study in the social sciences and humanities is considered equally valuable.

### REQUIREMENTS FOR ADMISSION

Ordinarily a baccalaureate degree is required for admission; but in certain instances outstanding students who have completed three full academic years at an accredited college or university are admitted. College years should be devoted to obtaining as broad an education as possible. The major objectives should be the following: (1) competence in the use of English, written and spoken; (2) capacity for quantitative thinking represented by mastery of mathematics; (3) such training in physical and biological science as will facilitate

comprehension of medical science and the scientific method; (4) a foundation for an ever-increasing insight into human behavior, thought and aspiration, through the study of man and his society as revealed by the social sciences and the humanities; and (5) some knowledge of a language and culture other than the student's own.

These objectives will ordinarily require completion of the following studies:

	<i>Quarter Units</i>	<i>Semester Units</i>
English .....	9	6
Physics .....	12	8
Chemistry		
Inorganic chemistry .....	12	8
Organic and quantitative chemistry .....	8	5½
(Also physical chemistry is highly recommended)		
Biology		
Biology .....	12-14	8-10
Vertebrate Embryology .....	4-5	3
Genetics .....	4-5	3
Mathematics (including college algebra) .....	6	4
(Also introductory calculus is highly recommended)		

Under certain circumstances the Committee on Admissions may consider students who have not fully satisfied all of these requirements.

Courses (e.g., human anatomy) which overlap in subject matter with those in the School of Medicine are not advised. However, advanced or specialized courses in biological science (e.g., cellular physiology) are desirable.

### COMPLETION OF REQUIREMENTS

The student must complete the premedical requirements before beginning the first year of medical studies, although these requirements need not be completed at the time application for admission is filed.

### PHYSICAL EXAMINATION

Accepted candidates must pass a physical examination before registering.

### FEES

For residents of California the total fee for each quarter is \$190.00 For non-residents the total fee for each quarter is \$507.00. These fees are subject to change.

### ADMISSION TO ADVANCED STANDING

Students who have completed one or two years in an approved medical school and who desire to transfer to this School may apply to the Office of Student Affairs of the School of Medicine for instructions. Application forms will not be available until April 1 and must be returned by June 1. Applications are accepted on a competitive basis to fill available places in the second- and third-year classes. In no case will applications for transfer to the fourth-year class be considered.



## INDIVIDUAL PROGRAMS OF STUDY IN THE MEDICAL CURRICULUM

Special programs of study for individual students may be arranged within the framework of the medical school curriculum. Normally these programs are available only after the student has completed his first year and with the approval of the Dean's Office and the chairman of the department responsible for the additional course work. Every effort is made to maintain flexibility within the medical school curriculum, although extensive changes in the course of study can be arranged for only a limited number of students.

Graduate work leading to the M.S. and/or Ph.D. degrees is offered, either separately or in conjunction with the M.D. program, in anatomy, biological chemistry, biomathematics, medical history, medical microbiology and immunology, pharmacology, physiology, psychiatry, and radiology. See the departmental announcements elsewhere in this catalog for further information. For details concerning the medical curriculum, consult the UCLA ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

## SCHOOL OF NURSING

The School admits students of junior or higher standing, and offers curricula leading to the degrees of Bachelor of Science, and Master of Nursing.

### Curricula

#### THE BACCALAUREATE PROGRAM

The Baccalaureate Program leading to the Bachelor of Science degree provides for a close interweaving of general and professional education. The social, emotional, and health aspects of nursing are emphasized throughout the curriculum. Nursing laboratory under the guidance of faculty members is provided in hospitals, outpatient clinics, schools, homes, and community health centers.

*Requirements for admission.* (1) Admission to the University; (2) completion of 21 courses of college work, including courses required by the School of Nursing. Eligibility for the study of nursing as determined by demonstrated aptitudes, recommendations, interviews, physical examinations and scholastic attainment.

#### REGISTERED NURSES

Students who are registered nurses will complete the curriculum required in the Baccalaureate Program.

*Requirements for admission.* (1) Graduation from an accredited school of Nursing and evidence of the fulfillment of the legal requirements for the practice of nursing; (2) personal and professional recommendations as required by the School of Nursing; (3) completion of the lower division requirements or transfer credit evaluated as the equivalent. (See the UCLA ANNOUNCEMENT OF THE SCHOOL OF NURSING.)

## GRADUATE PROGRAM

Under the jurisdiction of the Graduate Division, Los Angeles, the School of Nursing administers a program leading to the Master of Nursing degree. Available courses provide the opportunity for advanced study in several areas of nursing and research training for increased professional competence and specialization in a clinical field, for functional preparation in teaching, administration, supervision or public health—mental health nursing consultation. The Thesis Plan or the Comprehensive Examination Plan is followed in the Master of Nursing Program. For further information about the graduate programs in nursing, consult the **UCLA ANNOUNCEMENT OF THE GRADUATE DIVISION** and the **UCLA ANNOUNCEMENT OF THE SCHOOL OF NURSING**.

*Requirements for admission.* (1) Completion of an accredited baccalaureate program satisfactory to the UCLA School of Nursing, and to the UCLA Graduate Division; (2) evidence of status as a registered nurse; (3) recommendations as requested by the School of Nursing; (4) evidence of the fulfillment of the legal requirements for the practice of nursing; (5) an undergraduate scholarship record satisfactory to the UCLA School of Nursing, and to the UCLA Graduate Division; and (6) personal and professional recommendations as requested by the UCLA School of Nursing.

## ADMISSION

Applications for admission to the baccalaureate program in the School of Nursing should be filed not later than March 1, 1970 for the fall quarter; November 1, 1970 for the winter quarter. Applications for admission to the graduate program should be filed not later than April 15, 1970 for the summer quarter; May 15, 1970 for the fall quarter; October 15, 1970 for the winter quarter. The School of Nursing reserves the right to admit students on the basis of scholarship, recommendations, interviews, and demonstrated aptitudes.

Applications for admission to the undergraduate program (accompanied by a \$10 application fee) should be filed with the Office of Admissions, University of California, 405 Hilgard Avenue, Los Angeles, California 90024.

Applications for admission to the graduate program (accompanied by a \$10 application fee) should be filed with the Admissions Section of the Graduate Division, University of California, Los Angeles, California 90024.

Educational programs are planned in the School of Nursing after evaluations of credentials have been made by the Office of Admissions or the Graduate Division following receipt of applications for admissions.

## Requirements for the Degree of Bachelor of Science

The degree of Bachelor of Science will be granted upon fulfillment of the following requirements:

1. The candidate shall have completed at least 45 courses of college work, and shall have satisfied the general University requirements.

2. The candidate shall include, in the required 45 courses, at least 21 courses in general education.

3. The candidate shall have completed at least 23 upper division courses toward the degree.

4. The candidate shall have maintained at least a grade of C average in all courses taken.

5. The candidate shall have completed all required nursing courses in the School of Nursing and shall have maintained an average grade of C in all clinical nursing courses.

6. The candidate is required to have been enrolled in the School of Nursing during the final three quarters of residence; the last nine courses must be completed while so enrolled.

### **HONORS**

The faculty of the School of Nursing or a duly authorized committee thereof shall recommend for Honors or Highest Honors candidates for the bachelor's degree who meet the criteria determined by the faculty of the School of Nursing.

### **Requirements for the Degree of Master of Nursing**

The degree of Master of Nursing will be granted upon fulfillment of the following requirements:

1. The candidate shall have met the general requirements of the Graduate Division.

2. The candidate shall have completed in graduate status at least ten courses in upper division and graduate level courses; seven courses must be in nursing with five courses in the 200 and 400 series. The additional courses may be distributed among courses in the 100, 200 or 400 series subject to approval of the student's faculty adviser.

3. A Comprehensive examination or a thesis is required.

For further information concerning graduate work consult ANNOUNCEMENT OF THE GRADUATE DIVISION.

## **SCHOOL OF PUBLIC HEALTH**

### **General Information**

Public Health is a broad, multidisciplinary field of study directed toward understanding and controlling factors affecting the health of populations. One feature of the field of public health is a reliance on research methods to identify important health relationships. Another feature is a community or social approach to the problems of health and disease in their preventive or therapeutic aspects. The concerns of public health cut across national boundaries and include the functions of both voluntary and governmental agencies and of research and teaching institutions.

There are many areas of emphasis in the field, and five may be singled out as follows: (1) nature, extent and distribution of disease; (2) quantitative methods

of description and analysis; (3) environmental hazards, their identification and control; (4) the organization and delivery of community health services—emphasis is on the development of strategies for optimal provision of health care of high quality for all members of society; (5) basic biological and psychosocial processes that affect the health and well-being of populations.

The purpose of programs of instruction in the field of public health is to provide opportunity to develop understanding of the theoretical foundations and philosophy of the field, and to permit specialization in fields of professional service or research. This is achieved through required and elective courses that stress broad exposure to basic issues as well as intensive study in selected specialties.

Because of multidisciplinary concerns, programs of study are available to students whose academic preparation has been in the natural or social sciences as follows:

1. Medicine, nursing, engineering, dentistry and related fields.
2. Mathematics and statistics.
3. Sociology, psychology, economics, political science, etc.
4. Physical and life sciences.

Through organized programs in the School of Public Health, students entering the field may thus prepare themselves for careers in such basic specialties as epidemiology, biostatistics, nutritional science, or environmental health. They may also prepare themselves for the newer challenges of community well-being such as the operation of hospitals, health maintenance in industry, the health education of the public, organization of medical care, behavioral sciences in public health, and community health administration.

The School of Public Health offers the following degrees: Master of Science in Public Health, Master of Science in Biostatistics, Master of Public Health, Doctor of Public Health, Doctor of Philosophy (Biostatistics). The School of Medicine offers the degree of Master of Science in Preventive Medicine.

### **Fields of Concentration**

The School of Public Health offers Master of Public Health degree programs in the following areas of concentration: Behavioral Sciences and Health Education, Biostatistics, Environmental and Nutritional Sciences, Epidemiology, Health Administration, Hospital Administration, and Infectious and Tropical Diseases.

The Master of Science in public health degree programs are offered in Behavioral Sciences and Health Education, Environmental and Nutritional Sciences, Epidemiology, and Infectious and Tropical Diseases.

### **Graduate Record Examination**

The Graduate Record Examination Aptitude Test, verbal and quantitative, is required for admission to all graduate programs in the School of Public Health.

## **Master of Science in Public Health**

The Master of Science program provides research orientation within the general field of public health. It is intended to prepare the student in depth within a specialty, culminating in research activity and a thesis or a comprehensive examination. If the student's undergraduate course has been deficient in breadth of fundamental training and fails to provide a proper foundation for advanced work in the special area of his choice, it probably will be necessary for him to take specified undergraduate courses.

A student seeking admission to the Master of Science program at UCLA should hold a bachelor's degree from an institution of acceptable standing. His academic work should be substantially equivalent, in distribution of subject matter and in scholastic achievement to the requirements for a comparable degree at the University of California.

### **GENERAL REQUIREMENTS FOR THE DEGREE**

Only courses in which the student is assigned grades A, B, or C are counted in satisfaction of the requirements for a master's degree, and the student must maintain a B average to remain in graduate status.

The Master of Science in Public Health requires one to two years and must include at least three quarters in academic residence. The program will be planned on an individual basis, according to the student's need, and will include formal courses and research leading to a thesis or a comprehensive examination.

A minimum of nine courses (36 quarter units) is required of which at least five must be graduate level (courses numbered in the 200 or 500 series) although some programs may involve more than this.

Mandatory courses for the Master of Science in Public Health include the following subjects: (1) epidemiology (Public Health 147); (2) biostatistics (Public Health 160A, 160B); (3) research methods (Public Health 245A or another appropriate research course); (4) one additional research methods course in public health or in an appropriate cognate field.

A comprehensive examination in the area of specialization and the preparation of a written report are required if the student does not choose the thesis plan.

## **Master of Science in Biostatistics**

For admission to the Master of Science program in Biostatistics the student must have completed the bachelor's degree in statistics, mathematics, or in a field of application of biostatistics. Undergraduate preparation for the program should include Mathematics 12A-12B-12C or equivalent (second-year calculus), and Public Health 160A, 160B or the equivalent (introduction to biostatistics).

### **GENERAL REQUIREMENTS FOR THE DEGREE**

A minimum of nine courses (36 quarter units) is required, at least five of which must be graduate level (200 or 500 series) in biostatistics or mathematical statistics, including at least three courses in biostatistics. A comprehensive examination is also required. Under some conditions a thesis plan may be substituted for the comprehensive examination plan.

**DEGREE REQUIREMENTS**

1. Public Health 160C–160D (Introduction to Biostatistics)
2. Public Health 240A–240B–240C (Biostatistics)
3. Public Health 269A–269B–269C (Seminar in Biostatistics)
4. Mathematics 152A, 152B (Applied Mathematical Statistics) or Mathematics 150A–150B–150C (Probability and Statistics)

Other courses are selected with the adviser's consent. These may be additional courses in biostatistics or mathematical statistics, or they may be courses in related areas such as biology, mathematics, physiology, public health, or sampling theory.

**Master of Public Health**

Candidates to be admitted for the degree of Master of Public Health may be either:

1. Holders of professional doctoral degrees in medicine, dentistry, or veterinary medicine (with or without a prior bachelor's degree) from an acceptable school, or
2. Holders of a bachelor's degree from an acceptable institution, with adequate preparation in sciences basic to public health. Such sciences basic to public health include various combinations of: (a) Life sciences; (b) Physical sciences and mathematics; (c) Social sciences; (d) Behavioral sciences.

Applicants are not expected to be prepared in all four of these fields, but a background in a suitable combination of these sciences is required.

**GENERAL REQUIREMENTS FOR THE DEGREE**

Only courses in which the student is assigned grades A, B, or C are counted in satisfaction of the requirements for a master's degree, and the student must maintain a B average to remain in graduate status.

Award of the M.P.H. degree requires: (1) A minimum of 11 courses (44 quarter units) at least five of which must be graduate level (200, 400, or 500 series). For students with suitable previous graduate studies in public health subjects, this may be reduced to a requirement of 10 courses. Students majoring in hospital administration are required to take an administrative residency of three quarters. Students majoring in health education are required to take six quarters of full-time study. (2) Mandatory courses of at least one quarter in each of the following subjects: (a) biostatistics (usually Public Health 160A); (b) epidemiology (Public Health 147); (c) public health organization including environmental health administration (Public Health 450A, 450B, 450C). (3) A comprehensive final examination in (a) the general field of public health, and (b) the student's field of major concentration. (4) Field training in an approved health program of 10 weeks may be required of candidates who have not had prior field experience.

## **Doctor of Public Health**

The Dr.P.H. program is offered to provide education for higher level research, teaching, or professional service in public health than is attainable through the master's level programs.

High scholastic performance at undergraduate and master's level and a favorable recommendation by a faculty member in whose field the student intends to do his major concentration are required for admission, as well as completion of the Master of Public Health curriculum requirements or their equivalent, or a master's degree in an appropriately related field such as education, social work, psychology, physical and life sciences, etc.

### **GENERAL REQUIREMENTS**

A student must select two areas of concentration, a major area and a minor area. The major area may be selected from the following: Behavioral Sciences and Health Education, Biostatistics, Environmental and Nutritional Sciences, Epidemiology, Infectious and Tropical Diseases, Health Administration.

In general, two years of study in residence are required beyond the master's degree. In the first of these years, a full program of formal courses is ordinarily required for three quarters. In the second year, a minimum of one course per quarter for three quarters is required together with substantial concentration on research for the dissertation.

Academic preparation for the Dr.P.H. is directed toward general competence and depth of understanding in the major and minor areas as well as general understanding of the scope and aims of the broad field of public health. Instruction will include at least the mandatory course work required for the master's degree in the major as well as appropriate study in the minor.

On the advice of his major faculty adviser, a doctoral committee of five faculty members is appointed for each doctoral candidate. This committee advises the student on his course of study, reviews his dissertation and conducts the necessary examinations. Written and oral qualifying examinations are held near the conclusion of the academic preparation.

### **DISSERTATION**

The Dr.P.H. program culminates in a dissertation based on original research leading to a final examination. The subject of the dissertation should bear on some aspect of the student's field of major concentration and should demonstrate ability to plan and carry out independent investigation. Work on the dissertation is ordinarily started after successful completion of the qualifying examinations. Completion of the dissertation is at the student's own pace, but in any event, no more than five years after his advancement to candidacy.

## **Doctor of Philosophy (Biostatistics)**

A program of study leading to the degree of Ph.D. in biostatistics is offered. Reference should be made to the UCLA ANNOUNCEMENT OF THE GRADUATE DIVISION for general University requirements. The student's program of study

must be approved by the department and by the Graduate Council and it must embrace at the graduate course level three areas of knowledge: biostatistics, mathematical statistics, and a biomedical field such as biology, epidemiology, infectious diseases, medicine, microbiology, pharmacology, physiology, psychology, public health or zoology. Recommendation for the degree is based on the attainments of the candidate rather than on the completion of specific courses.

## **SCHOOL OF SOCIAL WELFARE**

The School of Social Welfare offers a two-year graduate program leading to the Master of Social Welfare degree. The curriculum deals with four major areas of study; Human Behavior, Social Welfare Services and Policy, Social Work Methods Theory and Social Work Research. In addition to academic courses in the above subjects, the curriculum provides for field instruction in selected social agency programs under tutorial direction. The School offers curriculum concentrations in Social Casework and Community Organization. Students are expected to enroll in the same concentration for two years of study.

### **ADMISSION REQUIREMENTS**

The School of Social Welfare offers courses on the graduate level only. *Admission to the School is scheduled in the Fall Quarter only, and applications for admission should be filed by April 15 for the following Fall Quarter.* Applicants must file an Application for Admission to Graduate Status with the Graduate Division of the University and, in addition, must file an application with the School of Social Welfare and submit other specified information.

Candidates are expected to meet the general requirements of the Graduate Division for admission to graduate status.

The School requires a minimum of 22.5 quarter units (or 15 semester units) in the social sciences or a combination of social science and social welfare subjects as prerequisite undergraduate preparation for graduate study in the field of social work. Completion of courses in psychology, sociology and statistics is ordinarily expected.

In addition to an acceptable academic record and completion of the above preparatory courses, the School of Social Welfare applies the following criteria in the selection of candidates: personal suitability for professional education and potential for successful social work practice, as defined by the School; a satisfactory state of health, as determined by a physical examination immediately prior to registration; and in the case of applicants over 35 years of age, assessment on an individual basis of the candidate's previous education and work experience.

### **APPLICATIONS FOR TRANSFER**

Opportunities for transfer from other schools of social work into the second-year program of study will be extremely limited in number and will be determined by the credentials and potentialities of the individual candidate.

Such applicants must have successfully completed the first year of the master's program in an accredited school of social work within five years immediately



preceding request for admission to the School. In addition, candidates must meet all other admission requirements of the School.

The School will prescribe the program required to qualify for the Master of Social Work degree. Candidates may be required to make up courses lacking for fulfillment of the degree requirements or to audit courses for up-dating of knowledge even though credit may have been granted for a similar course in another school.

A written evaluation of the candidate's first year of study will be requested from the institution in which the student completed his first year's work.

### **APPLICATIONS FOR READMISSION**

Applications for candidates who have completed the first-year program in the UCLA School of Social Welfare at some prior time and wish to return for completion of work toward the master's degree in social welfare will be considered on an individual basis. If more than five years have elapsed since completion of the first year's work, candidate may be required to enroll for the full two-year program.

### **PART-TIME STUDY**

The majority of students in the Master of Social Welfare program are in full-time attendance, completing all requirements for the degree within two consecutive years. Class scheduling is therefore arranged to meet the needs of this majority. A limited number of students may be admitted for study on a part-time basis which permits completion of the first-year academic courses and field instruction over a period of two academic years. The second-year program of study requires concurrent course and field instruction and necessitates enrollment on a full-time basis. Prospective students who are interested in completing the first year of study on a part-time basis are urged to discuss their plans fully with the School early in the admissions process.

### **FINANCIAL AID**

A number of federal, state, and local agencies make available scholarships and traineeships to graduate students in social welfare. Applications are for the most part made directly to the School. Additional information regarding these resources may be obtained from the Admissions Office of the School.

In addition to the above grants, a number of scholarships are offered through voluntary national and local organizations. General information concerning these scholarships may be obtained by writing to the School or to the Council on Social Work Education, 345 East 46th Street, New York, New York 10017. For information on University scholarships available to Social Welfare students, consult the announcement of the Graduate Division, GRADUATE STUDY AT UCLA.

### **MASTER OF SOCIAL WELFARE**

The degree of Master of Social Welfare will be granted upon fulfillment of the following requirements:

1. The candidate shall have fulfilled the general requirements of the Graduate Division and the University.

2. The candidate shall have satisfactorily completed the School's prescribed program of classroom and field instruction, in either the Social Casework or Community Organization curriculum concentration. This includes satisfactory completion of the required courses in the Research sequence and of a research project to be undertaken during the second year of study.

3. The candidate shall have achieved a minimum grade average of B in academic courses and in field instruction.

4. The candidate shall have spent a minimum of one year (three quarters) of study in residence at UCLA.

5. The candidate shall have satisfactorily passed a comprehensive final examination in the field of social welfare.

For information concerning courses and curricula, see the UCLA ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE and page 504 of this bulletin.

## THE GRADUATE DIVISION

UCLA offers graduate programs leading to the Master of Arts and Master of Science degrees in a wide range of fields; to the intermediate degree, Candidate in Philosophy; to the Doctor of Philosophy degree; to professional master's degrees in Architecture, Business Administration, Education, Engineering, Fine Arts (in Art and in Theater Arts), Journalism, Library Science, Nursing, Public Administration, Public Health, Social Psychiatry, and Social Welfare; to professional doctorates in Education, Public Health, and Social Welfare; to certificates in Library Science, Medicine, Meteorology, and Teaching English as a Second Language; and to certificates of completion for the elementary, secondary, and junior college teaching credentials and other advanced credentials for public school service. For more detailed information on requirements, consult the school and departmental sections of this catalog, and the Graduate Division publications, STANDARDS AND PROCEDURES FOR GRADUATE STUDY AT UCLA and STANDARDS AND PROCEDURES FOR PROGRESS AND EXAMINATIONS IN GRADUATE PROGRAMS AT UCLA.

### Definition of Academic Residence

A graduate student is considered in academic residence if he is registered for and completes at least one course (4 units) in graduate or upper division work during a quarter.†

### Full-Time Graduate Program

Graduate students (except Teaching and Research Assistants) are considered in full-time enrollment if they take at least two full courses in graduate and/or upper division work per quarter, or the equivalent of eight quarter units. Whenever possible, students are encouraged to expedite progress toward their degrees by taking the optimal program of three courses per quarter.

Teaching and Research Assistants are required to take at least one course per quarter, or the equivalent of four quarter units, throughout their appointments,

† Completion of at least one graduate or upper-division course (4 units) in either of the two 1970 Summer Sessions may be offered as the equivalent of one regular quarter of academic residence. Such credit may be earned in only one of these Summer Sessions.

and are considered in full-time enrollment with this minimum. During the first quarter of their appointment they may not take more than two courses or the equivalent of eight quarter units. A student is required to be registered throughout his appointment. If a Teaching or Research Assistant finds it necessary to request a leave of absence or to withdraw, his appointment is terminated.

Graduate students holding fellowships administered by the University are required to take at least two courses per quarter or the equivalent of eight quarter units, both before and after advancement to candidacy. These courses may be in the 500 series of individual study or research.

Prospective graduate students who are eligible for Selective Service or federal or state subsidy may consult the UCLA Office of Special Services regarding definition of full-time program for these purposes.

## Requirements for Graduate Degrees

### PREPARATION

An applicant for any advanced degree must possess a bachelor's degree from an institution of acceptable standing and must have completed the prerequisites for graduate study in his field at UCLA. He should consult the department in which he wishes to study concerning special departmental requirements or other aspects of graduate study in addition to those common to all UCLA graduate programs.

### Master's Degrees

The Master of Arts is offered in the following fields:

African Area Studies	History	Oriental Languages
Anthropology	Islamic Studies	Philosophy
Archaeology	Italian	Physics (M.A.T.)*
Art	Journalism	Political Science
Astronomy	Latin	Psychology
Botany	Latin American Studies	Slavic Languages and Literatures
Classics	Linguistics	Sociology
Dance	Luso-Brazilian Language and Literatures	Spanish
Economics	Mathematics	Speech
Education	Mathematics (M.A.T.)*	Teaching English as a Second Language
English	Medical History	Theater Arts
Folklore and Mythology	Microbiology	Urban Planning
French	Music	Zoology
Geography	Near Eastern Languages and Literatures	
German		
Greek		

The Master of Science is offered in the following fields:

Anatomy	Geology	Physical Education
Biochemistry	Information Science	Physics
Biological Chemistry	(Documentation)	Physiology
Biostatistics	Medical Microbiology and Immunology	Planetary and Space Physics
Business Administration	Medical Physics (Radiology)	Preventive Medicine and Public Health
Chemistry	Meteorology	Public Health
Computer Science	Pharmacology	
Engineering		
Geochemistry		

\* Master of Arts in Teaching.

**Other master's degrees offered:**

Architecture (M.Arch.)	Engineering (M.Engr.)	Public Health (M.P.H.)
Art (M.F.A.)	Journalism (M.J.)	Social Psychiatry (M.S.P.)
Business Administration (M.B.A.)	Library Science (M.L.S.)	Social Welfare (M.S.W.)
Education (M.Ed.)	Nursing (M.N.)	Theater Arts (M.F.A.)
	Public Administration (M.P.A.)	

**PLAN**

At the option of his major department, the student follows either the Thesis Plan or the Comprehensive Examination Plan. The University minimum standards are the same under either plan. A department, however, may require a higher scholarship average and courses and examinations in addition to the minimum requirements of the Graduate Division.

**UNIVERSITY MINIMUM STANDARDS**

*Courses.*\*\* The program of courses consists of at least nine graduate and upper division courses completed in graduate status, including at least five graduate courses. For the Master of Arts, Master of Science, and Master of Arts in Teaching, the five graduate courses may be in the 200 series (graduate courses and seminars) and the 500 series (directed individual study or research for graduate students). For other master's degrees, they may be in the 400 series (graduate professional courses) as well as in the 200 and 500 series.

*Standard of Scholarship.* UCLA requires at least a B average in all courses taken in graduate status on any campus of the University of California and in all courses for the master's degree.

*Transfer of Credit.* By petition, courses completed in graduate status on other University of California campuses may apply to master's programs at UCLA. If approved, such courses may fulfill up to one-half the total course requirement, one-half the graduate course requirement, and one-third the academic residence requirement.

Also by petition, courses completed in graduate status at institutions other than the University of California may apply to UCLA master's programs. A maximum of two such courses (the equivalent of eight quarter units or five semester units) may apply, but these courses may not be used to fulfill either the five-graduate-course requirement or the academic residence requirement.

A maximum of two courses completed in University Extension may, by petition, apply to the University minimum nine-course requirement, exclusive of the five-graduate-course requirement. Such credit is limited to the following: (1) "concurrent" University Extension courses (which are offered for regularly registered students for degree and grade-point credit as well as for Extension students), and (2) starred (\*) University Extension courses completed before July 1, 1969. Grades earned in University Extension are not applicable for the removal of scholarship deficiencies.

Correspondence courses are not applicable to graduate degrees.

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\*\* Under the Quarter System at UCLA, the term "course" refers to a full course (4 quarter units). With this as a standard, departments may offer a half course (2 quarter units), a course and a half (6 quarter units) or a double course (8 quarter units). The requisite nine-course minimum for a master's degree may be fulfilled through combination of such courses.

*Academic Residence.* The student completes at least three quarters of academic residence in graduate status at the University of California, including at least two quarters at UCLA. He is in academic residence if he registers for (and completes) at least one course (4 units) in graduate or upper-division work during a quarter.

*Foreign Language.* If the degree program includes a foreign language requirement, every effort should be made to fulfill this before the beginning of graduate study or as early as possible thereafter so that the language skill will be of maximum benefit. The student normally meets these requirements by completing one or more examinations. In French, German, Russian, and Spanish he takes examinations which the Educational Testing Service (ETS) offers at UCLA and at other locations throughout the United States several times a year. In other languages, examinations are administered by foreign language departments at UCLA. When language requirements are to be fulfilled by ETS examinations, prospective graduate students are normally encouraged to take these examinations while still juniors and seniors if possible, and their scores, if sufficiently high, will satisfy foreign language requirements for their graduate degrees. UCLA requires a minimum ETS score of 500 for passing.

Questions on foreign language requirements should be addressed to departments; questions about the examinations should be directed to the Language Examination Coordinator, Student and Academic Affairs Section, Graduate Division, or to the Educational Testing Service, Princeton, New Jersey 08540. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION for a chart summarizing departmental foreign language requirements.

*Advancement to Candidacy.* Advancement to candidacy takes place after formal approval of the student's program, which may include work in progress. He files for advancement to candidacy no later than the second week of the quarter in which he expects to receive the degree. In case of unexpected delay in completing work in progress during the final quarter, he may have up to one additional year in which to complete all requirements.

## **THESIS OR COMPREHENSIVE EXAMINATION**

Under the Thesis Plan, the student's thesis is a report of the results of his original investigation. Before beginning work on the thesis, the student obtains approval of the subject and general plan from the faculty members concerned and from his Thesis Committee. This Committee, consisting of three members appointed by the Dean of the Graduate Division, is responsible for final approval of the thesis. The Manuscript Adviser for Theses and Dissertations and the Graduate Division publication, STANDARDS AND PROCEDURES FOR ADVANCED DEGREE MANUSCRIPT PREPARATION, provide guidance in the final preparation of the manuscript.

Under the Comprehensive Examination Plan, the examination is administered by a committee appointed by the department. In certain fields this examination may also serve as a screening or qualifying examination for a doctoral program.

## DEPARTMENTAL SCHOLAR PROGRAM

Departments may nominate exceptionally promising undergraduates (juniors and seniors) as Departmental Scholars to pursue bachelor's and master's degree programs simultaneously.

Qualifications include the completion of 24 courses (96 quarter units) at UCLA—or the equivalent at a similar institution—and the requirements in preparation for the major. To obtain both the bachelor's and master's degrees the Departmental Scholar will fulfill requirements for each program and maintain a minimum average of B. He may not use any course to fulfill requirements for both degrees.

Interested students should consult their departments well in advance of application dates for admission to graduate standing (page 29).

## MASTER'S DEGREES OTHER THAN THE M.A. AND M.S.

For master's degrees other than the M.A. and M.S. there may be specific University minimum requirements in addition to the foregoing. Information on these may be obtained from the departmental graduate adviser.

## SECOND MASTER'S DEGREES

Although the University discourages study for additional master's degrees, a student who wishes to work for a second master's in a new field may request permission to do so in advance, and the Graduate Division will review his petition on the basis of its particular merits. Work applied to the first master's degree is not applicable to the second.

## Candidate in Philosophy Degree

In those departments for which the Graduate Council has approved formal proposals for its award, the intermediate degree Candidate in Philosophy (C.Phil.) may be awarded qualified students upon advancement to candidacy in Ph.D. programs. Requirements for the C. Phil. are identical with those for advancement to candidacy for the Ph.D., with the exception that the student must have completed four quarters of academic residence, including three quarters (ordinarily the last three) in continuous residence at UCLA. Applicants may obtain further information from the department in which they wish to study.

The Candidate in Philosophy is offered in the following fields:

Business Administration	History	Near Eastern Languages and Literatures
Classics	Indo-European Studies	Oriental Languages
Economics	Italian	Philosophy
English	Linguistics	Political Science
French	Mathematics	Psychology
Geography	Meteorology	Romance Languages and Literatures
Geology	Music	Sociology
Hispanic Languages and Literatures		

## Doctoral Degrees

The doctorate is awarded candidates who have displayed understanding in depth of the subject matter of their discipline as well as ability to make original contributions to knowledge in their field. The degree is an affidavit of critical aptitude in scholarship, imaginative enterprise in research, and proficiency and style in communication.

The Doctor of Philosophy is offered in the following fields:

Anatomy	Geology	Neuroscience
Anthropology	Germanic Languages	Oriental Languages
Anthropology-Sociology	Hispanic Languages	Pharmacology
Archaeology	and Literatures	Philosophy
Art History	History	Physics
Astronomy	Indo-European Studies	Physiology
Biochemistry	Islamic Studies	Planetary and Space
Biological Chemistry	Italian	Physics
Biostatistics	Linguistics	Political Science
Botany	Mathematics	Psychology
Business Administration	Medical History	Romance Languages
Chemistry	Medical Microbiology	and Literatures
Classics	and Immunology	Slavic Languages
Computer Science	Medical Physics	and Literatures
Economics	(Radiology)	Sociology
Education	Meteorology	Special Education*
Engineering	Microbiology	Speech
English	Molecular Biology	Theater History
French	Music	Urban Planning
Geochemistry	Near Eastern Languages	Zoology
Geography	and Literatures	

Other doctoral degrees offered:

Education (Ed.D.)	Public Health (Dr.P.H.)	Social Welfare (D.S.W.)
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## UNIVERSITY MINIMUM STANDARDS

*Courses.* The student takes whatever formal courses his department may require or recommend for knowledge in his field and preparation for qualifying examinations. The University has no formal course requirements for doctoral programs other than the academic residence requirement. The 500 series of directed individual study or research courses is designed for graduate research, preparation for examinations, and preparation of the thesis or dissertation.

*Standard of Scholarship.* UCLA requires at least a B average in all courses taken on any campus of the University of California for the entire time the student has been in graduate status.

*Academic Residence.* The student completes at least two years of academic residence in graduate status at the University of California, including one year, ordinarily the second, in continuous residence at UCLA. In most cases a longer period of academic residence is necessary, however, and from three to five years

\* Joint program with California State College at Los Angeles.

is generally considered optimal. A graduate student is in academic residence if he registers for (and completes) at least one course (4 units) in graduate or upper-division work during a quarter.

*Foreign Language.* Every effort should be made to complete foreign language requirements before the beginning of graduate study or as early as possible thereafter so that the language skill will be of maximum benefit. In any case, students in doctoral programs requiring one or more languages must complete at least one language before the oral qualifying examination. The student normally meets these requirements by completing one or more examinations. In French, German, Russian, and Spanish he takes examinations which the Educational Testing Service (ETS) offers at UCLA and at other locations throughout the United States several times a year. In other languages, examinations are administered by foreign language departments at UCLA. When language requirements are to be fulfilled by ETS examinations, prospective graduate students are normally encouraged to take these examinations while still juniors and seniors if possible, and their scores, if sufficiently high, will satisfy foreign language requirements for their graduate degrees. UCLA requires a minimum ETS score of 500 for passing.

Questions on foreign language requirements should be addressed to departments; questions about the examinations should be directed to the Language Examination Coordinator, Student and Academic Affairs Section, Graduate Division, or to the Educational Testing Service, Princeton, New Jersey 08540. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION for a chart summarizing departmental foreign language requirements.

*Qualifying Examinations.* At an appropriate time in the doctoral program, written qualifying examinations are administered by a departmental guidance committee. After successful completion of these examinations and of part or all of the foreign language requirement, a doctoral committee is formally appointed by the Dean of the Graduate Division to conduct the oral qualifying examination, to supervise the research and writing of the dissertation, and to conduct the final oral examination.

*Advancement to Candidacy.* After the student has successfully completed the oral qualifying examination, he is eligible for advancement to candidacy.

*Dissertation.* The candidate demonstrates his ability for independent investigation by completing a dissertation in his principal field of study. His choice of subject must be approved by his doctoral committee, which also reviews and approves the dissertation prospectus for circulation in the department and guides him in the research and writing. The Manuscript Adviser for Theses and Dissertations and the UCLA publication, STANDARDS AND PROCEDURES FOR ADVANCED DEGREE MANUSCRIPT PREPARATION, provide guidance in the final preparation of the manuscript. The doctoral committee and the Dean of the Graduate Division approve the completed dissertation.

*Final Oral Examination.* The final oral examination, conducted by the doctoral committee, deals primarily with the relation of the candidate's dissertation to the field of knowledge to which it contributes.





### **Doctoral Degrees Other Than the Ph.D.**

For doctoral degrees other than the Ph.D. there may be specific University minimum requirements in addition to the foregoing. Requirements for these degrees are described in the sections of this catalog devoted to the appropriate schools, and further information may be obtained from the announcements of these schools and from the graduate advisers.



# Courses of Instruction

## CLASSIFICATION AND NUMBERING

The classification and numbering of courses are described below.

### Undergraduate Courses

Undergraduate courses are classified as lower division and upper division. *Lower division courses* (numbered 1–99) are open to freshmen and sophomores, and are also open to upper division students but without upper division credit. *Upper division courses* (numbered 100–199) are ordinarily open to students who have completed at least one lower division course in the given subject, or two years of college work. Courses in the 100 series may be offered in partial satisfaction of the requirements for the master's degree by a student registered in graduate status, if taken with the approval of the major department.

### Graduate Courses

Graduate courses (*numbered 200–299*) are ordinarily open to students admitted in graduate status. As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course evidence of satisfactory preparation for the work proposed.

*Individual study or research graduate courses* (numbered 500–599) may be used to satisfy minimum higher degree requirements within the limitations prescribed by the major department and approved by the Graduate Council.

### Professional Courses

*Teacher-training courses* (numbered 300–399) are highly specialized courses dealing with methods of teaching, and are acceptable toward the bachelor's degrees only within the limitations prescribed by the various colleges or schools. Courses in this series do not yield credit toward a higher degree.

Courses *numbered 400–499* are professional courses other than teacher-training courses. They are acceptable toward academic degrees only within the limitations prescribed by the various colleges, schools, or Graduate Division, Los Angeles.

### University Extension Courses

University of California Extension courses bearing numbers prefixed by X, XB, XD, XI, XL, XR, XSB, XSC, XSD yield credit toward the bachelor's degree. They are rated, with respect to the general and specific requirements for the degree, on the same basis as courses taken in residence at collegiate institutions of approved standing. Concurrent enrollment in resident courses and in University Extension courses (or courses at another institution) taken with a view to credit toward a degree is permitted only when the entire program has been approved in advance by the dean of the student's college.

### Course Listings

Each course in the following listings by departments, as in the samples that follow, has the credit value of a full course unless otherwise noted. Thus a listing

**Mathematics 11A–11B–11C. Calculus and Analytic Geometry.** indicates three full courses, 11A, 11B, and 11C; while a listing

**Botany 211A–211F. Advanced Plant Physiology.** ( $\frac{1}{2}$  course each) indicates six half courses, 211A, 211B, 211C, 211D, 211E, and 211F. Some courses have a variable value; for example,

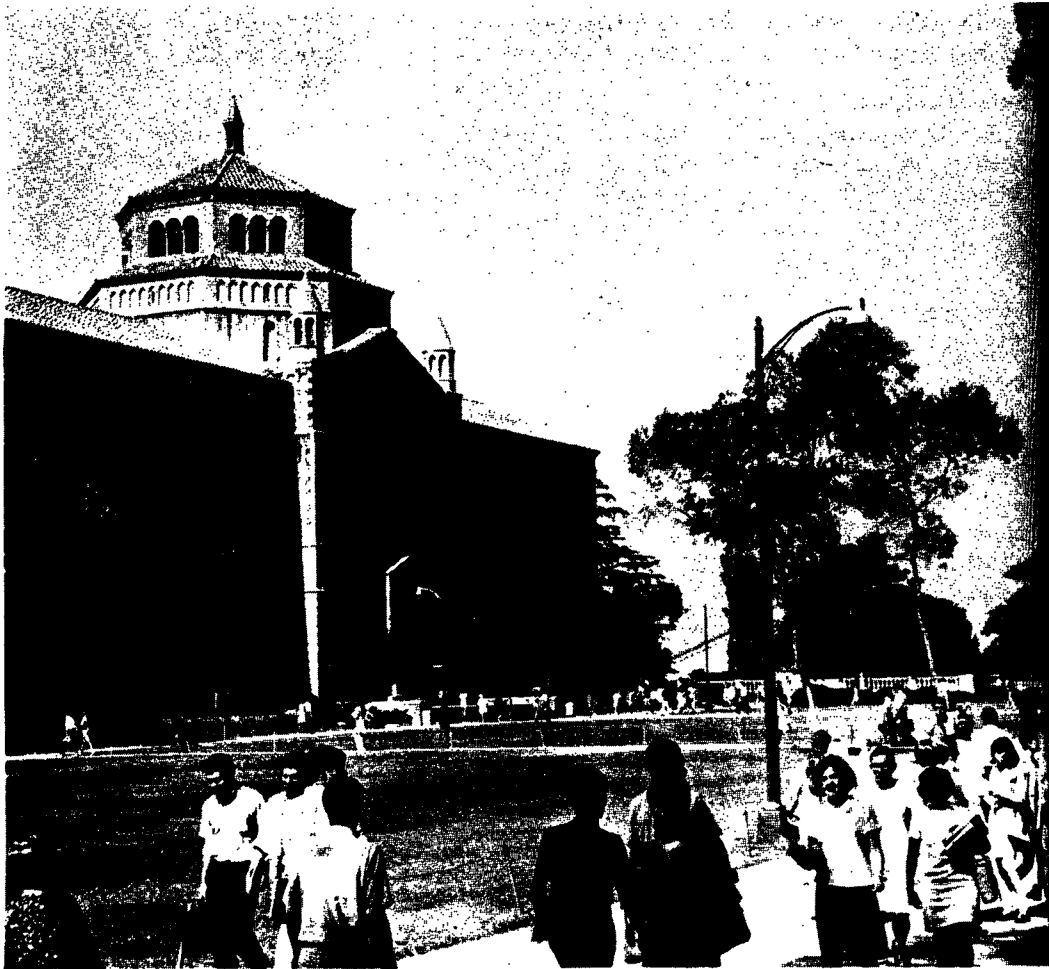
**Business Administration 596A–596N. Research in Business Administration.**  
( $\frac{1}{4}$  to  $1\frac{1}{2}$  courses)

where within the limits indicated, the exact value of the course is fixed for each individual student when he enrolls.

Where noted, credit for a specific course is dependent upon completion of a subsequent course.

#### **Credit for Courses**

The normal undergraduate program is four courses each quarter and a minimum of 45 courses is required for the bachelor's degree. At least nine courses are required for the master's degree. The credit value of a course is equivalent to 4.0 quarter units. Fractional or multiple courses are equivalent to proportionate numbers of quarter or semester units. Quarter units will be posted to the records of all students (graduate or undergraduate) registered during the Fall Quarter 1966 or thereafter.



## ■ AEROSPACE STUDIES

(Department Office, 251 Social Welfare Building)

Dean S. Gausche, B.S., M.A., *Lt. Colonel, U. S. Air Force, Professor of Aerospace Studies (Chairman of the Department).*

Stephen L. Sutton, B.A., M.A., *Major, U. S. Air Force, Associate Professor of Aerospace Studies.*

William C. Stewart, B.A., *Captain, U. S. Air Force, Assistant Professor of Aerospace Studies.*

### Air Force Reserve Officers Training Corps (Air Force ROTC)

The mission of the Air Force ROTC is to develop in selected college students those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the U. S. Air Force. The objectives of the program are to: (1) develop in cadets an understanding of the U. S. Air Force history, mission, organization, operation, problems, and techniques; (2) develop in cadets the ability to work with others on group activities and assume a leadership role when required.

### Four-Year Program

The four-year program is open to beginning freshmen. It consists of an initial two-year General Military Course (GMC), and a terminal two-year Professional Officer Course (POC). In this program, the cadets in the POC are required to attend a four-week summer field training course between their junior and senior years. Students attending the summer field training are provided meals, quarters, travel expenses, and are paid about \$100.00. All students enrolled in the POC receive a \$50.00 per month retainer fee for 20 consecutive months.

Applicants desiring to enter flying training as pilots after being commissioned must have 20-20 vision, uncorrected, in each eye and normal color perception. Qualified students will receive 36 hours of flight training in civilian aircraft during their second year of the POC at no cost to the individual.

Applicants for training as navigators must have uncorrected distance vision of better than 20-50 bilaterally, corrective to 20-20 bilaterally and near vision of 20-20 bilaterally, uncorrected. Pilot and navigator applicants must not have reached 26½ years of age at the time of their commissioning.

Students not desiring flight training must have a bilateral distance vision of at least 20-400, corrective to 20-40 in one eye and

20-30 in the other and must not have reached their 28th birthday at time of commissioning.

### Scholarship Program

Scholarships are available to qualified cadets in the four year program only. These cover full tuition, laboratory expenses, incidental fees, and an allowance for books.

#### Freshman Year

#### 1A. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. An analysis of the nature and principles of war and of national power. Lt. Col. Gausche

#### 1B. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. Prerequisite: course 1A. A survey of the organization of the Department of Defense and of the mission and organization of the U. S. Air Force and the Strategic Offensive Forces. Lt. Col. Gausche

#### 1C. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. Prerequisites: course 1B. A survey of the mission and organization of the Strategic Offensive Forces and of the Strategic Defensive Forces. Lt. Col. Gausche

#### Sophomore Year

#### 21A. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. Prerequisites: courses 1A, 1B and 1C. This course continues the study of world military systems. This course surveys the mission and organization of the Strategic Offensive Forces and the Aerospace Support Forces. Lt. Col. Gausche

#### 21B. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. Prerequisite: course 21A. A survey of the mission and organization of Aerospace Support Forces and a comparative analysis of the conceptual bases and operational techniques of Democracy and Communism. Lt. Col. Gausche

#### 21C. World Military Systems. (½ course)

Lecture-seminar, one hour; leadership laboratory, one hour. Prerequisite: course 21B. A discussion of national alliances and collective security. Concludes with an analysis of the search for peace. Lt. Col. Gausche

### Four-Week Field Training Course

This course comprises 232 hours which includes academics, physical training, individual weapons familiarization, flying familiarization, and field exercises. The training is conducted on a United States Air Force base. Field Training Course Staff

**Two-Year Program**

The two-year Air Force ROTC program is offered to accommodate those students who have attained at least junior standing and have two years remaining in the University, either as an undergraduate or graduate student. A prerequisite for students entering this program is successful completion of a six-week field training course on an Air Force base during the summer preceding their enrollment in the program.

Students interested in this program must make application to the Professor of Aerospace Studies during the fall quarter preceding the six-week summer field training course. Students attending the six-week summer field training are provided meals, quarters, travel expenses, and are paid about \$120.00. Students enrolled in the POC receive \$50.00 per month retainer fee for 20 consecutive months.

Data concerning physical and age qualifications for flying and navigator training and for nonflying applicants is the same as for four-year program.

**Six-Week Field Training Course**

This course comprises 296 hours of six-week duration which includes academics, physical training, individual weapons familiarization, familiarization flying and field exercises. The training is conducted on a United States Air Force base.

Field Training Course Staff

**131A. Growth and Development of Aerospace Power.**

Seminar, three hours; Corps Training, one hour. Prerequisite: Completion of GMC or six-week Summer Field Training. A survey course about development of aviation and the study of the growth of air-

power in the U.S. up to 1950. Practicing communication techniques and developing communicative abilities under the close supervision of the instructor.

Capt. Stewart

**131B. Growth and Development of Aerospace Power.**

Seminar, three hours; Corps Training, one hour. Prerequisite: Course 131A. A survey course about Air Force concepts, doctrine, and employment. A study of aerospace power today and the future of manned aircraft. A continued emphasis on communicative abilities.

Capt. Stewart

**131C. Growth and Development of Aerospace Power.**

Seminar, three hours, leadership laboratory, one hour. Prerequisite: course 131B. A survey course about the United States space vehicle systems, the propulsion, propellants and power sources, control and guidance, ground support, manned space flight, operations in space and future developments in space. Continued emphasis on communicative abilities.

Captain Stewart

**141A. The Professional Officer.**

Seminar, three hours; leadership laboratory, one hour. Prerequisite: course 131C. An introduction to the foundation of the military profession, management and human relations. Leadership theories and their practical application.

Maj. Sutton

**141B. The Professional Officer.**

Seminar, three hours; leadership laboratory, one hour. Prerequisite: course 141A. An introduction to the principles of military discipline, human relations, and personnel policies. The junior officer as an administrator and the Military Justice System. Development of oral and written communicative skills and the Air Force approach to problem solving.

Maj. Sutton

**141C. The Professional Officer.**

Seminar, three hours; leadership laboratory, one hour. Prerequisite: course 141B. An introduction to the principles and functions of management. The junior officer as an administrator and the Military Justice System. Briefing for commissioned service.

Maj. Sutton

**■ AFRICAN STUDIES****Special Program in African Studies**

For details of the program in African Studies taken in conjunction with a bachelor's degree, see pages 72-73 of this bulletin.

**Master of Arts in African Area Studies**

The program for the Master of Arts in African Area Studies is designed to provide interdisciplinary training in the African area. It provides more extensive information about Africa and a greater number of disciplinary approaches to it than the regular degree programs. An interdisciplinary degree which has its own value, the M.A. program also furnishes an approach to doctoral work related to Africa. Students gain exposure to several disciplines before deciding on the one most closely suited to their interests and capabilities.

The degree is intended (a) to give an African area dimension to the studies of students in a specific academic discipline and (b) to help prepare students who wish to work in Africa. The Center gives new emphasis to the study of the arts and humanities in relation to Africa, and a master's degree is now possible in this field under the Master of Arts in African Area Studies as presently constituted. Such components as literature in French or English, ethnomusicology, and traditional art may be combined with background studies in anthropology or an African language to produce a synthesis in the field. A doctor's degree in African Studies is not offered because it is believed that at such a level training should be in one academic discipline with the emphasis on Africa which

the department recommends. The master's degree is administered by the Committee on the Master's Degree in African Area Studies.

#### Admission to the M.A. Program

In addition to meeting the requirements of the Graduate Division, the student must have adequate preparation in undergraduate fields related to the program. Required preparation for the Master's degree in African Area Studies is a degree of Bachelor of Arts in the social sciences or arts and humanities. The program requires between one and two years to complete, depending upon the student's preparation and the courses selected.

#### Requirements for the Master's Degree

*General Requirements:* See pages 153-154.

*Foreign Language.* A proficiency in reading one of the following languages: Afrikaans, Arabic, Dutch, French, German, or Portuguese. In addition, study of an African language is suggested.

*Course of Study.* A minimum of nine courses dealing with Africa in at least three disciplines. Of these, five or more must be at the graduate level (200 series). A student in the Master's Program must offer a major and a minor field. Major field concentration is defined as a minimum of four courses, of which two must be at the graduate level; minor field concentration is defined as a minimum of two courses, at least one of which must be at the graduate level. A student may, with the consent of the graduate advisor, offer methodology courses or contrastive courses for purposes of completing his major or minor fields of concentration. The student will be held responsible for both the major and minor fields in his final examination sequence for the M.A. degree. As a third discipline, a student will be expected to take African Languages 190 (Survey of African Languages) or a survey course on Africa in a field outside his major and minor areas of concentration. Courses taken prior to the M.A. program, may, with the consent of the Graduate Advisor, be counted as meeting part of the requirements in the two fields, but will not reduce the total of nine courses.

*Qualifying Examination.* The student must pass both a written and oral examination for the Master's degree. The written examination will cover the major field of concentration. In the oral examination, the student will be held responsible for both the major and minor fields of concentration.

There is no thesis requirement for the Master's degree. An examining committee,

with the Chairman drawn from the student's major field of concentration, will administer the examination sequence. The purpose of the oral examination is to test the student's ability to relate knowledge of Africa across disciplinary boundaries.

The following courses pertaining to Africa are offered by the departments listed. With the approval of the Committee, other related courses may be included in a student's program.

#### Anthropology 107A-107B. Peoples of Africa.

127. Primitive Art.

141. Oral Art and Drama of Non-Western Peoples.

148. The Theory of Oral Literature.

152. Traditional Political Systems.

208. African Cultures.

258. Selected Topics in African Cultures.

261. Myth and Ritual.

269. Selected Topics in African Arts.

285. Social Anthropology.

596. Directed Studies (Africa).

#### Art 118C. The Arts of Sub-Saharan Africa.

119A. The Arts of Africa: Western Sudan

119B. The Arts of Africa: The Guinea Coast.

119C. The Arts of Africa: The Congo.

220. The Arts of Africa, Oceania and Pre-Columbian America.

#### Economics 110. Economic Problems of Underdeveloped Countries.

111. Theories of Economic Growth and Development.

112. Policies for Economic Development.

211. Economic Growth of Underdeveloped Areas: Theory and Structure.

212. Economic Growth of Underdeveloped Areas: Models and Policy.

213A-213E. Selected Problems of Economic Development.

596. Individual Study (Africa).

#### Education 204A. Comparative Education.

204B. African Education.

253A. Current Problems in Comparative Education.

253B. African Education.

#### English 114. Survey of African Literature in English.

250K. Contrastive Analysis of English and Other Languages.

271. Studies in African Literature in English.

370K. The Teaching of English as a Second Language.

#### French 221A. Introduction to the Study of French African Literatures.

- 221B. French-African Literature of Madagascar and Bantu Africa.  
 221C. French-African Literature of Berber-Sudanese and Arabo-Islamic Africa.  
 257A-257B. Studies in the French-African Literature.

**Geography** 188. Northern Africa.

189. Middle and Southern Africa.  
 288. Africa.  
 290. Seminar: Selected Regions (Africa).

**History** 125A-125B-125C. History of Africa.

- 126A-126B. History of West Africa.  
 127A-127B. History of East and Central Africa.  
 128A-128B. History of Southern Africa.  
 129. History of Northeast Africa.  
 133A-133B. History of North Africa from The Moslem Conquest.  
 135. Introduction to Islamic Culture.  
 199. Special Studies in History (Africa).  
 230N. Advanced Historiography (Africa).  
 240N. Topics in History (Africa).  
 265A-265B. Seminar in African History.  
 267A-267B. Seminar in Near Eastern History.  
 596. Directed Studies.

**Linguistics** 220A. Linguistic Areas (Africa).**African Languages** 101A-101B-101C. Elementary Swahili.

- 102A-102B-102C. Intermediate Swahili.  
 103A-103B-103C. Advanced Swahili.  
 104A-104B-104C. Elementary Luganda.  
 107A-107B-107C. Elementary Sotho.  
 108A-108B-108C. Elementary Zulu.  
 109A-109B-109C. Elementary Xhosa.  
 110A-110B-110C. Intermediate Xhosa.  
 111A-111B-111C. Elementary Yoruba.  
 112A-112B-112C. Intermediate Yoruba.  
 113A-113B-113C. Elementary Igbo.  
 114A-114B-114C. Intermediate Igbo.  
 115A-115B-115C. Elementary Twi.  
 121A-121B-121C. Elementary Fula.  
 131A-131B-131C. Elementary Bambara.  
 132A-132B-132C. Intermediate Bambara.  
 141A-141B-141C. Elementary Hausa.  
 142A-142B-142C. Intermediate Hausa.  
 150A-150B. African Literature in English Translation.  
 190. Survey of African Languages.  
 192. Comparative Studies in African Languages.  
 199. Special Studies in African Languages.  
 201A-201B. Comparative Niger-Congo.  
 202A-202B. Comparative Bantu.  
 260. Seminar in African Languages.

270. Seminar in African Literature.  
 596. Directed Studies.

**Music** 140A-140B-140C. Musical Cultures of the World.

- 143A-143B. Music of Africa.  
 190A-190B. Proseminar in Ethnomusicology.  
 255. Seminar in Musical Instruments of the Non-Western World.  
 280. Seminar in Ethnomusicology.

**Near Eastern Languages****Arabic** 102A-102B-102C. Intermediate Arabic.

- 103A-103B-103C. Advanced Arabic.  
 111A-111B-111C. Spoken Egyptian Arabic.  
 130A-130B-130C. Classical Arabic Texts.  
 140A-140B-140C. Modern Arabic Texts.  
 150A-150B. Survey of Arabic Literature in English.  
 199. Special Studies in Arabic.

**Berber Languages** 101A-101B-101C. Elementary Berber.

- 102A-102B-102C. Advanced Berber.  
 120A-120B-120C. Introduction to Berber Literature.  
 199. Special Studies in Berber Languages.  
 201. Berber Structure.

**Semitics** 101A-101B-101C. Elementary Amharic (Modern Ethiopic).

- 102A-102B-102C. Advanced Amharic (Modern Ethiopic).  
 201A-201B-201C. Old Ethiopic.  
 202A-202B-202C. Readings in Old Ethiopic Literature.  
 209A-209B-209C. Comparative Study of the Ethiopian Languages.  
 280A-280B-280C. Seminar in Comparative Semitics.  
 290A-290B-290C. Comparative Morphology of the Semitic Languages.

**Political Science** 115. Theories of Political Change.

130. New States in World Politics.  
 185. Government and Politics in North Africa.  
 166A-D. Government and Politics in Sub-Saharan Africa.  
 167. Ideology and Development in World Politics.  
 250E. African Studies.  
 250K. North African Studies.  
 271. Seminar in Political Change.  
 596. Directed Individual Study or Research (Africa).



- Sociology 130. Social Processes in Africa.  
 132. Population and Society in the Middle East.  
 140. Political Sociology.  
 235. Social Structure and Social Movements.

- 255A-255B. Systematic Sociological Theory.  
 258. Sociology of Religion.  
 272. Sociology of Political Movements.  
 596. Special Problems in Sociology (Africa).

## ■ AGRICULTURAL SCIENCES

(Department Office, 280 Kinsey Hall)

Walter Ebeling, Ph.D., *Professor of Entomology.*

Vernon T. Stoutemyer, Ph.D., *Professor of Ornamental Horticulture (Chairman of the Department).*

Arthur Wallace, Ph.D., *Professor of Plant Nutrition.*

Sidney H. Cameron, Ph.D., *Emeritus Professor of Plant Physiology.*

William H. Chandler, Ph.D., LL.D., *Emeritus Professor of Horticulture.*

### Undergraduate Study

Requirements for a major in the field of agriculture can no longer be met at Los Angeles and students beginning their work at Los Angeles with intentions to transfer should consult the catalogs of the campus on which the major is available.

Students electing majors in agriculture may satisfy certain lower division requirements in courses in other departments at Los Angeles and then transfer to the campus, Berkeley, Davis, or Riverside, where the major work is offered. The available majors cover a broad range of interests from soil,

food, plant and animal sciences to family and consumer interests. Various phases of agricultural economics and agricultural education are also available.

The first three years of the agricultural engineering curriculum are available in the College of Engineering at Los Angeles.

Students who register at Los Angeles with the intention of transferring to another campus for completion of their studies in agriculture, may obtain information and advice through the office of the Chairman of the Department of Agricultural Sciences at Los Angeles.

## ■ ANATOMY

(Department Office, 73-235 Health Sciences Center)

W. Ross Adey, M.D., *Professor of Anatomy and Physiology.*

Mary A. B. Brazier, Ph.D., *Professor of Anatomy, Biophysics and Physiology in Residence.*

Nathaniel A. Buchwald, Ph.D., *Professor of Anatomy in Residence.*

Carmine D. Clemente, Ph.D., *Professor of Anatomy (Chairman of the Department).*

Earl Eldred, M.D., *Professor of Anatomy.*

John D. French, M.D., *Professor of Anatomy and Clinical Professor of Surgery.*

James N. Hayward, M.D., *Professor of Anatomy.*

Lawrence Kruger, Ph.D., *Professor of Anatomy.*

H. W. Magoun, Ph.D., *Professor of Anatomy.*

David S. Maxwell, Ph.D., *Professor of Anatomy.*

Richard E. Ottoman, M.D., *Professor of Radiology and Anatomy.*

Daniel C. Pease, Ph.D., *Professor of Anatomy.*

Charles H. Sawyer, Ph.D., *Professor of Anatomy.*

Arnold B. Scheibel, M.D., *Professor of Anatomy and Psychiatry.*

John D. Schlag, M.D., *Professor of Anatomy in Residence.*

Jose P. Segundo, M.D., *Professor of Anatomy in Residence.*

Reidar F. Sognnaes, Ph.D., D.M.D., *Professor of Anatomy and Oral Biology.*

Richard W. Young, Ph.D., *Professor of Anatomy.*

Edwin L. Cooper, Ph.D., *Associate Professor of Anatomy.*  
 Rafael Elul, M.D., *Associate Professor of Anatomy.*  
 Roger A. Gorski, Ph.D., *Associate Professor of Anatomy (Vice-Chairman, Graduate Affairs).*  
 Anthony M. Adinolfi, Ph.D., *Adjunct Assistant Professor of Anatomy.*  
 P. Dean Bok, Ph.D., *Assistant Professor of Anatomy.*  
 John H. Campbell, Ph.D., *Assistant Professor of Anatomy.*  
 Emilio E. Decima, M.D., *Assistant Professor of Anatomy in Residence.*  
 Louis J. Goldberg, D.D.S., Ph.D., *Assistant Professor of Dentistry and Anatomy.*  
 Albert V. LeBouton, Ph.D., *Assistant Professor of Anatomy.*  
 Richard N. Lolley, Ph.D., *Assistant Professor of Anatomy in Residence.*  
 Paula M. Orkand, Ph.D., *Adjunct Assistant Professor of Anatomy in Residence.*  
 Eberhardt K. Sauerland, M.D., *Assistant Professor of Anatomy.*  
 M. B. Sterman, Ph.D., *Adjunct Assistant Professor of Anatomy in Residence.*  
 Anna N. Taylor, Ph.D., *Assistant Professor of Anatomy in Residence.*  
 Jack D. Thrasher, Ph.D., *Assistant Professor of Anatomy.*



Elmer Belt, M.D., *Lecturer in Surgical Anatomy and Medical History and Clinical Professor of Surgery.*  
 Jan Berkhout, Ph.D., *Assistant Research Anatomist.*  
 George W. Bernard, D.D.S., Ph.D., *Lecturer in Anatomy and Associate Professor of Dentistry (Oral Biology).*  
 Michael Chase, Ph.D., *Assistant Research Anatomist and Adjunct Assistant Professor of Physiology.*  
 Anatol Costin, M.D., Ph.D., *Associate Research Anatomist.*  
 Donald J. Davenport, M.D., *Assistant Clinical Professor of Anatomy.*  
 Ross M. Durham, Ph.D., *Assistant Research Anatomist.*  
 Thelma Estrin, Ph.D., E.E., *Research Engineer in Anatomy.*  
 Rochelle J. Cavalas, Ph.D., *Assistant Research Anatomist.*  
 Karl-Heinz Ginzler, M.D., *Associate Research Anatomist.*  
 William S. Glassman, M.D., *Assistant Clinical Professor of Anatomy.*  
 J. C. B. Grant, M.B., Ch.B., F.R.C.S., *Visiting Professor of Anatomy.*  
 Fred Herzberg, D.D.S., *Research Anatomist and Clinical Professor of Oral Biology.*  
 Gunnar Heuser, M.D., *Assistant Research Anatomist and Assistant Professor of Medicine in Residence.*  
 Jessamine O. Hilliard, Ph.D., *Associate Research Anatomist.*  
 Takashi Hoshizaki, Ph.D., *Associate Research Anatomist.*  
 Chester D. Hull, Ph.D., *Associate Research Anatomist.*  
 Allan Jacobson, M.D., *Assistant Research Anatomist.*  
 Joyce D. Kales, M.D., *Assistant Research Anatomist.*  
 Takuji Kasamatsu, M.D., *Assistant Research Anatomist.*  
 Nobuo Kawabata, B.E., *Assistant Research Anatomist.*  
 Bernard Kenton, Ph.D., *Assistant Research Anatomist.*  
 Harold Lyons, Ph.D., *Research Theoretical Physicist in Anatomy.*  
 Dennis R. Malkasian, Ph.D., *Acting Instructor.*  
 James G. McElligott, Ph.D., *Assistant Research Anatomist.*  
 Dennis J. McGinty, Ph.D., *Assistant Research Anatomist.*  
 James J. McNew, Ph.D., *Assistant Research Anatomist.*  
 Donald H. Perkel, A.B., *Lecturer in Anatomy.*  
 Richard C. Peterson, Ph.D., *Assistant Research Anatomist.*  
 Anselmo R. Pineda, M.D., *Assistant Clinical Professor of Anatomy.*

Lionel D. Rovner, B.S.E.E., *Associate in Anatomy.*

Sant S. Sekhon, Ph.D., *Assistant Research Anatomist.*

Bernard Towers, M.B., Ch.B., M.A. (Cantab.), *Visiting Professor of Anatomy and Pediatrics.*

Arthur A. Uyeda, Ph.D., *Assistant Research Anatomist.*

Donald O. Walter, Ph.D., *Associate Professor of Physiology in Residence and Associate Research Anatomist.*

William F. Windle, Ph.D., *Visiting Research Anatomist.*

Wanda Wyrwicka, Ph.D., *Assistant Research Anatomist.*

#### Admission to Graduate Status

Students intending to take advanced degrees in the Department of Anatomy must have a bachelor's degree in physical or biological science, or in the premedical curriculum. Introductory courses in zoology and vertebrate embryology are required, as well as one year of general and organic chemistry and one year of college physics. Deficiencies in these courses must be made up before the student is admitted. Strongly recommended are courses in comparative anatomy, microscopic technique, elementary statistics, philosophy of science, and scientific German and French.

#### Requirements for the Master of Science Degree

The student seeking to enter the profession of anatomy must apply himself directly to attaining the Ph.D. degree. The Department offers the Master of Science degree only for the restricted purposes of individuals whose major interest lies in allied fields (paramedical subjects, postgraduate medicine or dentistry).

Candidates may elect either the thesis or examination plan. If the latter, the candidate must demonstrate a knowledge of general principles of anatomy, as well as competence in a restricted area of the science. The following courses are required of all master's candidates: two of the major anatomy courses chosen from Anatomy 101, 206 and 207; one departmental seminar; other courses as necessary to the candidate's particular program. No foreign language is required.

#### Requirements for the Doctor of Philosophy Degree

The following courses are required: Anatomy 101, 206, 207; Biochemistry; Mammalian Physiology; at least two different departmental seminars; additional courses selected by the student and his adviser as necessary to his program. Anatomy 210 and 257 are strongly recommended.

The student must demonstrate the ability to read two foreign languages. The first should be selected from a choice of German

or French, but Russian and Spanish may be accepted upon departmental approval. The second language may be any modern language, provided the student can demonstrate its particular value to his area of study. An individual course of study may be substituted for the second language upon departmental approval. He must complete successfully both written and oral qualifying examinations; gain teaching experience in three of the major anatomy courses; present and defend his dissertation on his research. His total program should not require more than four years to complete.

#### Upper Division Courses

##### 101. Microscopic Anatomy. (2 courses)

Four 3-hour sessions per week in the fall quarter. Prerequisite: enrollment in School of Medicine or consent of the instructor. Microscopic study of the tissues and organs of the human body.

Mr. Pease and Staff

##### 102A-102B. Gross Anatomy of the Human Body.

(½ course, 2 courses)

(Formerly numbered 100 and 102.) One hour of lecture and four of lab per week in the winter quarter; four hours of lecture and twelve of lab per week in the spring. Prerequisite: enrollment in School of Dentistry or consent of the instructor. Course 102A is prerequisite to 102B. Credit and grade are given only upon completion of 102B. Systemic and topographical human anatomy with dissection of the human cadaver. Emphasis on head and neck.

Mr. Sauerland and Staff

##### 103. Basic Neurology.

Two 4-hour sessions and one 3-hour session per week in the spring quarter. Prerequisite: enrollment in School of Medicine. Must be taken concurrently with Physiology 103. Lectures, conferences, demonstrations and laboratory procedures necessary to an understanding of the function of the human nervous system.

Mr. Eldred and Staff

##### 104. Mammalian Histology. (1½ courses)

Three 3-hour sessions per week in the fall quarter. Prerequisite: enrollment in School of Dentistry or consent of the instructor. Lectures, demonstrations and laboratories dealing with the structural organization of tissues and organs at the microscopic level.

Mr. Cooper and Staff

##### 105A-105B. Gross Anatomy.

See 207A-207B Gross Anatomy.

**108. Mammalian Neurology.**

One 1-hour session and one 4-hour session per week in the winter quarter. Prerequisite: enrollment in School of Dentistry or consent of the instructor. Lectures, demonstrations and laboratories dealing with the fundamental structure and functional organization of the nervous system.

Mr. Sterman, Mrs. Taylor

**Graduate Courses****206. Neurosciences: The Introductory Course for Graduate Students. (2 courses)**

Six hours of lecture and four of lab per week in the spring quarter. Prerequisite: consent of the instructor. Fundamental approaches to neuroanatomy, neurophysiology and the brain mechanisms for behavior.

Mr. Scheibel and Staff

**207A-207B. Gross Anatomy. (2 courses, 1 course)**

Four 4-hour sessions per week in the fall quarter; two 4-hour and one 1-hour session per week in the winter quarter. Prerequisite: consent of the instructor. Course 207A is prerequisite to 207B. Credit and grade are given only upon completion of 207B. Medical students enroll for 105A-105B. Lectures and dissection of the human body.

Mr. Sawyer and Staff

**208A-208B. Basic Electronics for Research in Experimental Anatomy and Neurophysiology.**

Two hours of lecture and four of lab per week in the fall and winter quarters. Prerequisite: consent of the instructor. Course 208A is prerequisite to 208B. Credit and grade are given only upon completion of 208B. Applications of electronic instrumentation to problems of data acquisition, recording and analysis with emphasis on practical solutions.

Mr. Rovner

**209. Fine Structure and Function in the Central Nervous System. (½ course)**

Two 1-hour sessions per week in the fall quarter. Prerequisite: Basic Neurology. Lectures and discussion of the fine structure of selected areas of central nervous system, together with related electrical and biochemical patterns of activity.

Mr. Scheibel

**210A-210B. Selected Techniques in Anatomical Research. (½ course each)**

One 4-hour session per week in the winter and spring quarters. Credit and grade will be given only upon completion of 210B. Laboratory exercises, demonstrations and lectures to provide experience with a variety of research techniques, including fixation, embedding, sectioning, staining, autoradiography, microradiography, electron microscopy, electrophoresis, paper and thin layer chromatography, photomicrography, and tissue culture.

Mr. Young

**211. Anatomical and Physiological Substrates of Behavior.**

One 2-hour lecture and demonstration per week in the fall quarter with labs scheduled by instructor when desirable. Prerequisite: Microscopic Anatomy, Mammalian Physiology. Anatomy and physiology of cerebral processes in alerting, learning and memory.

Mr. Adey

**212. Neural Mechanisms of Inhibition. (½ course)**

Two hours per week in the fall quarter. Prerequisite: Basic Neurology. A systematic consideration of inhibitory processes in the nervous system from the synapse to integrated behavior. Special attention

is given to the recent concepts of inhibition at the behavioral level and their implications for learning, emotion and mental health.

Mr. Sterman

**213. Evolution and the Structure of Biomolecules. (½ course)**

One 2-hour session per week in the spring quarter. Prerequisite: consent of instructor and upper level courses in two of the following subjects: genetics, evolution, biochemistry. Interpretation of pattern in molecular organization of living organisms in terms of evolution, and considerations of the impact of such pattern on evolutionary theory.

Mr. Campbell

**214. Data Acquisition in Behavioral Neurophysiology.**

Two hours per week in the Winter Quarter. Prerequisite: course 211. Neurophysiological techniques in behavioral studies; data acquisition systems and computer analysis of neurophysiological data.

Mr. Adey

**215. Biopotentials in Volume Conductor. (½ course)**

Two hours of lecture per week in the winter quarter. This course will provide medical and graduate students with the theoretical background for interpretation of biopotentials recorded through volume conductor, such as EEG, ERG, EMG, and ECG.

Mr. Ethel

**216. Instrumentation and Apparatus for Research in Experimental Anatomy and Neurophysiology.**

Two hours of lecture and four of lab in the spring quarter. Prerequisite: courses 208A-208B or consent of the instructor. Techniques are presented for reduction of biologic data to metrics and experience is provided in their use.

Mr. Rovner

**250. Problems in Developmental and Cellular Biology. (½ course)**

One 2-hour session per week in the fall quarter. Prerequisite: consent of the instructor. Review of literature in comparative cell biology with emphasis on cellular and molecular mechanisms controlling cell proliferation and specialization.

Mr. Thrasher

**251. Problems in Developmental and Comparative Immunology. (½ course)**

One 2-hour session per week in the winter quarter. Prerequisite: consent of the instructor. Review of current literature emphasizing early development and evolution of immune competence.

Mr. Cooper

**253. Seminar in Experimental Neurology.**

Two 90-minute and one 2-hour sessions per week in the winter and spring quarters. Prerequisite: consent of instructor. Quantitative analysis of information processing in the nervous system.

Mr. Segundo

**255A-255D. Seminar in Endocrinology. (½ course each)**

One 2-hour lecture per week in the winter and spring quarters. Prerequisite: consent of the instructor.

Mr. Gorski, Mr. Hayward, Mr. Sawyer

**257. Journal Reviews in Experimental Anatomy. (½ course)**

One 2-hour session per week in the spring quarter. Research frontiers in various fields of experimental anatomy are reviewed and mutually discussed by graduate students and professors.

Mr. Clemente, Mr. Kruger

**258. Seminars in Neuroscience Teaching.****(½ course)**

Two hours per week in the fall, winter and spring quarters. Prerequisite: A course in basic neurology and course 209. Topics of current interest or ongoing research projects are presented, and both content and method of presentation are examined. May be repeated for credit. Mr. Scheibel

**495. Communicating Scientific Information.****(½ course)**

Two hours of lecture per week in the winter quarter. Prerequisite: enrollment for the M.S. or Ph.D. in Anatomy. Student papers and lectures serve as the basis for group discussions of the art and science of effective written and oral communication of

scientific information. May be repeated for credit. Mr. Hayward, Mr. Young

Individual Study and Research

**596. Directed Individual Study or Research.****(½ course to 3 courses)**

The Staff

**597. Preparation for the Master's Comprehensive Examination or the Doctoral Qualifying Examination. (½ course to 3 courses)**

The Staff

**598. Thesis Research for Master's Candidates.****(½ course to 3 courses)**

The Staff

**599. Dissertation Research for Ph.D. Candidates.****(½ course to 3 courses)**

The Staff

**■ ANTHROPOLOGY**

(Department Office, 360 Haines Hall)

Joseph B. Birdsell, Ph.D., *Professor of Anthropology.*Walter R. Goldschmidt, Ph.D., *Professor of Anthropology.*Theodore D. Graves, Ph.D., *Professor of Anthropology.*Hilda Kuper, Ph.D., *Professor of Anthropology.*Clement W. Meighan, Ph.D., *Professor of Anthropology.*Wendell H. Oswalt, Ph.D., *Professor of Anthropology.*Ralph H. Turner, Ph.D., *Professor of Anthropology and Sociology.*Johannes Wilbert, Ph.D., *Professor of Anthropology.*Ralph L. Beals, Ph.D., *Emeritus Professor of Anthropology.*Harry Hoijer, Ph.D., *Emeritus Professor of Anthropology.*William A. Lessa, Ph.D., *Emeritus Professor of Anthropology.*C. Rainer Berger, Ph.D., *Associate Professor of Anthropology, Geophysics and History.*Robert B. Edgerton, Ph.D., *Associate Professor of Anthropology and Psychiatry.*Michael Moerman, Ph.D., *Associate Professor of Anthropology.*Philip L. Newman, Ph.D., *Associate Professor of Anthropology (Chairman of the Department).*Henry B. Nicholson, Ph.D., *Associate Professor of Anthropology.*Donald R. Ackerman, Ph.D., *Assistant Professor of Anthropology.*Christopher Donnan, Ph.D., *Assistant Professor of Anthropology.*David C. Epstein, Ph.D., *Assistant Professor of Anthropology.*James N. Hill, Ph.D., *Assistant Professor of Anthropology.*Murray J. Leaf, Ph.D., *Assistant Professor of Anthropology.*Peter S. Miller, Ph.D., *Assistant Professor of Anthropology.*Frederick T. Plog, Ph.D., *Assistant Professor of Anthropology.*William B. Rodgers, Ph.D., *Assistant Professor of Anthropology.*James R. Sackett, Ph.D., *Assistant Professor of Anthropology.*Peter Z. Snyder, Ph.D., *Assistant Professor of Anthropology.*Bobby J. Williams, Ph.D., *Assistant Professor of Anthropology.*Clyde Woods, Ph.D., *Assistant Professor of Anthropology.*Marlys McClaran, A.B., *Acting Assistant Professor of Anthropology.*Sterling Robbins, B.A., *Lecturer of Anthropology.*

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William O. Bright, Ph.D., *Professor of Linguistics and Anthropology.*Pamela J. Brink, Ph.D., *Assistant Professor, School of Nursing.*Marija Gimbutas, Ph.D., *Professor, Classics.*John G. Kennedy, Ph.D., *Assistant Professor of Psychiatry and Anthropology.*Robert D. McCracken, Ph.D., *Assistant Professor of Public Health and Anthropology.*

**Preparation for the Major**

Required: Anthropology 1A-1B, 5A-5B-5C.

**The Major**

A major change from previous catalogs has been made in the grouping of courses and group requirements. Students having 90 units (Junior) or more may enter the program administered by this catalog by giving written notification to the Registrar.

Required: (1) ten quarter courses or their equivalent including at least one course from each of six groups; and (2) four upper division courses from economics, geography, history, political science, psychology, or sociology, chosen in consultation with an advisor.

Students intending to continue for a graduate degree are advised to take Anthropology 182A-182B, at least one course in field training (Group VII), and Anthropology 173 or its equivalent.

Students must also meet the requirements of the University and the College of Letters and Science for graduation.

**Graduate Requirements**

All students should obtain a detailed statement of the graduate program from the graduate secretary, Department of Anthropology, 373 Haines Hall.

The department offers the M.A. and Ph.D. degrees. For the Ph.D. degree, all students are required to obtain research experience and a thorough background in both substantive and methodological areas. The department offers specialized training in archeology, ethnology, linguistics and physical anthropology, and encourages the definition of interests which combine various aspects of these subfields with each other or with areas outside anthropology.

**Admission**

In addition to meeting the general graduate requirements listed elsewhere in this catalog, students are admitted to the department by an Admissions Committee. Graduate enrollment is limited and candidates will be chosen on the following bases: (1) prior scholastic performance; (2) ratings and recommendations by professors and other individuals; (3) a term paper or other research paper; and (4) scores on the Graduate Record Examination. Students may enter the program only in the Fall Quarter. Candidates are normally admitted for the Ph.D. only.

**Program and Advising**

On entering, each student will be assigned an advisor. His function will be to acquaint

the student with the department and to assist him in devising an initial plan of study. By the beginning of the second quarter, the student will have formed a two-man advisory committee. This committee will assist the student in formulating a long-term plan of study developed around the student's interests which provides for those courses, seminars and research experiences that will best prepare him to implement and develop his interests. When it has been determined that the student is prepared for the Ph.D. qualifying examinations, his advisory committee will be extended to a five-man Ph.D. committee including two members from outside the department. This committee will administer the Ph.D. qualifying examinations, supervise the student's doctoral research, and administer the final oral examination after completion of the thesis.

**Requirements for the M.A. and Ph.D. degrees**

**General.** A dossier developed for each student will contain materials relevant to deciding whether a student is prepared to take his qualifying examination. This material will consist of a study plan and stated objectives, all term papers, written evaluations of course and seminar work by the student's instructors, annual written evaluations by the advisory committee of progress toward stated objectives, and a research paper on a topic developed by the student in consultation with his committee. The research paper, and all other materials, will be reviewed by a third member appointed to the advisory committee in the quarter when the research paper is completed. The student's file will then be presented for full faculty review, such review normally taking place not later than the sixth quarter of residence. Students admitted to the department with an advanced degree from another department may prepare for the qualifying examinations, but may not take them until three quarters of residence have been completed.

**Language Requirement.** The student must pass the Graduate Language Examination (ETS) in one foreign language before the oral qualifying examination. Also, before taking the qualifying examination, he must pass an examination administered by his Ph.D. committee testing his knowledge of a corpus of substantive or theoretical literature relevant to his area of specialization in the same language.

**M.A. Degree.** The Department does not admit candidates for the M.A. only; the M.A. degree is not required of candidates for the

Ph.D. degree. However, graduate students preparing for the Ph.D. normally qualify and apply for the M.A. after satisfactory completion of a research paper and after faculty review. The research paper and the oral examination constitute a comprehensive examination.

**Ph.D. Degree.** Advancement to candidacy for the Ph.D. is dependent on passing qualifying examinations. In accordance with university regulations, the Ph.D. committee conducts both a written and an oral examination. The written examination, conducted by the departmental representatives on the committee, will be considered to be in the nature of a preparation for the oral examination. The character of the written examination will be determined by the committee, in consultation with the student, and need not consist of a closed book examination. The content of the oral examination, conducted by both departmental and non-departmental representatives on the committee, will also be determined by the committee. Upon successful completion of the Qualifying Examinations and Advancement to Candidacy, the student will proceed with dissertation research. The dissertation will be an original contribution to anthropological literature, normally, but not necessarily, based upon field work. Award of the Ph.D. degree is based on the dissertation and a final oral examination.

#### **The Doctor of Philosophy Degree in Anthropology-Sociology (Interdepartmental)**

The Ph.D. degree in anthropology and sociology is awarded upon demonstration of an integrated command of the two disciplines and completion of a dissertation that demonstrates research competence relevant to both. For admission to the joint degree program the student must have completed the Bachelor's degree (or equivalent work) in either anthropology or sociology, and must be acceptable for graduate standing in both departments. Upon admission to the program the student is assigned a guidance committee consisting of two members from anthropology and two from sociology, to be appointed by the respective department chairmen. The committee in consultation with the student formulates the program of work and delineation of fields, and this program will be submitted to both departments for approval. Candidates will conform to the general requirements for the Ph.D. set forth by the Graduate Division. The student may follow the language requirement of either department.

The student must demonstrate his competence in theory, methods of research, and a special field for both disciplines. 1) Competence must be demonstrated in ethnological theory by satisfactory completion of Anthropology 202 and a special essay in this area, and in sociological theory by passing the General Theory section of the Department's comprehensive examination at the level required for the Ph.D. in sociology. 2) The student must satisfactorily complete the graduate methods course and supervised field training in anthropology, sociology 18, (or its equivalent), sociology 110A, and any one of the two-quarter sequences in the Sociology 211-218 series. The student may be exempted from sociology 18, 110A, or both on the basis of examination. 3) A special field in anthropology and a special field in sociology will be established for each student so as to form a coherent unit. The student must pass an examination in each field.

#### **Lower Division Courses**

##### **1A-1B. The Principles of Human Evolution.**

Lecture, three hours; discussion-demonstration section, one hour. Course 1A is prerequisite to course 1B. Human population biology in the conceptual framework of evolutionary processes. Vertebrate and primate evolution and interpretation of the fossil human record. Concepts of race formation and classification in terms of human population genetics. These courses are required as preparation for the major. The Staff

##### **5A-5B-5C. Introduction to Cultural Anthropology.**

###### **5A. Principles of Cultural Anthropology.**

Lecture, three hours; discussion section, one hour. Course 5A is prerequisite to courses 5B and 5C. The character of culture and nature of social behavior as developed through anthropological study of contemporary peoples. The Staff

###### **5B. Methods of Ethnology.**

Lecture, three hours; discussion section, one hour. An introduction to the strategy of ethnological field work; an examination of the relationship between the situation of field observation and the nature of ethnological generalization; concept formation and research design. The Staff

###### **5C. Culture History.**

Lecture, three hours; discussion section, one hour. The development of culture from its first beginnings to the advent of writing as developed through archeological investigation. Courses 5A-5B-5C are required as preparation for the major. The Staff

##### **11. The Evolution of Man.**

Not open for credit to students who have had Anthropology 1A-1B. This course does not satisfy major requirements. An intensive course in the biology of man, with emphasis on his evolutionary development and his place in nature (with particular attention to nonhuman primates and fossil man); genetic and racial diversity; and theories and problems of race. Mr. Birdsell

**22. General Cultural Anthropology.**

Lecture, three hours; discussion section, one hour. This course does not satisfy major requirements. Students who have had Anthropology 22 will not receive credit for Anthropology 100 (formerly numbered 12). An introduction to the cultural understanding of human behavior designed for students who do not plan further work in anthropology. Stress is placed on those concepts and theories that are applicable to the everyday life and professional activities in the modern world. Examples of institutions and individual behavior of modern America are counterpointed against studies of primitive life.

The Staff

**Upper Division Courses**

Courses 1A-1B, 5A-5B-5C or upper division standing are prerequisite to all upper division courses, except as otherwise stated. All upper division courses with letter designations (A, B, etc.) may be taken independently except as otherwise stated.

**100. Anthropology and the Modern World.**

(Formerly numbered 12.) Lecture, three hours. May not be taken for credit by students who have taken Anthropology 22. Not applicable toward group requirements for the B.A. degree in Anthropology but may be applied toward the ten required anthropology courses for the major. The impact of cultural and social anthropology upon modern consciousness and contemporary affairs. Effects of anthropology upon selected areas such as psychology, art, music, literature. Role of anthropology in various professions, in policy making and in directed culture change.

Mr. Oswalt

**101. The Social Sciences in Psychiatry.**

(Same as Psychiatry 105.) Prerequisite: consent of the instructor. Not applicable toward degree in anthropology. An introduction to the fields of social psychology, sociology, cultural anthropology and ethnology.

Mr. Kennedy

**120. The Individual in Culture.**

For non-majors. The course considers the balance of freedom and determinism for individuals and societies in the interrelation of personality, social structure and culture. It surveys the nature and limits of human plasticity; the variability and uniformity of personality within and between cultures; the relation of normal and abnormal, conformity and deviance.

Mr. Edgerton

**GROUP I. ETHNOGRAPHY**

This group contains courses of a descriptive nature where the intent is to survey the cultural patterns of an ethnic group either diachronically or synchronically.

**102. World Ethnography.**

Survey of principal culture types and their distribution; discussion of ethnological problems.

Mr. Oswalt

*Area Courses.* Prerequisite: courses 5A, 5C, 22 or 102. Each course is a survey of native peoples and cultures in designated areas of the world. The survey will include discussions of technological, social and ideational patterns among the ethnic groups of the area.

Special ethnological and theoretical problems will be covered as appropriate. Outside reading and papers may be required.

**103A-103D. Peoples of Asia.**

103A. South Asia.

Mr. Leaf

103B. Southeast Asia.

Mr. Moerman

103C. East Asia.

103D. Soviet Asia.

**105A-105C. Peoples of Latin America.**

105A. Peoples of South America.

(Formerly numbered 107.)

Mr. Wilbert

105B. Peoples of Middle America.

(Formerly numbered 109.)

Mr. Woods

105C. Latin American Societies.

(Formerly numbered 121.)

**106A-106E. Peoples of North America.**

106A. Peoples of California: Ethnography.

Mr. Meighan

106B. Peoples of California: Prehistory.

Mr. Meighan

106C. Peoples of North America.

(Formerly numbered 105.)

Mr. Oswalt

106D-106E. Archaeology of North America.

(Formerly numbered 135A-135B.) Prerequisite: courses 5A-5B-5C or course 22 or consent of the instructor. Course 106D is prerequisite to 106E. Prehistory of the North American Indians; prehistoric culture areas; relations with historic Indians.

Mr. Hill

**107A-107B. Peoples of Africa.**

107A. East and South Africa.

(Formerly numbered 108A.)

Mrs. Kuper

107B. West and Central Africa.

(Formerly numbered 108B.)

The Staff

**110. Peoples of the Pacific.**

(Formerly numbered 104.)

Mr. Lessa

**108. Cultures of the Arab World.**

(Formerly numbered 147.) Contemporary social life and cultural characteristics of diverse ethnic groups in the Near East and Northern Africa; continuities in cultural orientations; cultural conflict and development; the relation of cultural orientation to modern political organization and social problems.

**109A-109B. Old Stone Age Archeology.**

(Formerly numbered 131A-131B.) Prerequisite: courses 5A-5B-5C or consent of the instructor. Course 109A is prerequisite to 109B. No credit will be allowed for course 109A without course 109B. The development of Paleolithic and Mesolithic cultures of Europe, Africa and Asia, emphasizing the ordering and interpretation of archeological data, pleistocene geology and chronology, the relationship between human, cultural and biological evolution.

Mr. Sackett

**GROUP II. DEVELOPMENT OF MAN AND CULTURE**

This group contains two kinds of courses in terms of method: Those courses primarily historical in orientation where the concern is to present sequences of change in the development of man and culture, and those courses concerned with general theories of change.



**118A-118B. Fossil Man and His Culture.**

(Formerly numbered 155A-155B.) Course 120A is prerequisite to 120B. No credit will be allowed for course 120A without course 120B. An introduction to paleoanthropology; the morphology, ecology and culture of fossil man in the light of the synthetic theory of evolution. Mr. Sackett

**119. Culture Stability and Culture Change.**

(Formerly numbered 165.) Problems of cultural and social change, including the impact of western civilization on native societies.

Mr. Moerman, Mr. Rodgers

**122A. Comparative Society.**

(Formerly numbered 125.) Prerequisite: courses 5A-5B-5C, or Sociology 1 or consent of the instructor. The general principles of the organization of society; the relation of these to the technological complexity and ecological conditions of the culture; the principles of evolutionary development of social systems.

Mr. Epstein, Mr. Moerman

**122B. History of Human Evolutionary Theory.**

(Formerly numbered 158.) The men, the events, and the spirit of the time which mark man's attempts to understand his origins and diversity. Mr. Williams

**122C. Technology and Environment.**

(Formerly numbered 126.) Significance of material culture in archeology and ethnology; problems of invention and the acceptance of innovations; the ecological and sociological concomitants of technological systems; selected problems in material culture.

Mr. Donnan

**123A-123B. Origins of Old World Civilization.**

(Formerly numbered 130A-130B.) Prerequisite: courses 5A-5B-5C or course 22. Course 123A is prerequisite to 123B. A survey of the prehistoric foundations and cultural development of primary civilizations in the Near East, Europe and Asia as revealed by archeology; theories of cultural evolution and diffusion based upon archeological discovery. The Staff

**123C. Ancient Civilizations of Western Middle America (Nahuatl Sphere).**

(Formerly numbered 133A.) Prerequisite: course 5A-5B-5C or course 22 or consent of the instructor. Pre-Hispanic and Conquest period native cultures of western Middle America as revealed by archeology and early colonial writings in Spanish and Indian languages. Toltec-Aztec and Mixteca civilizations and their predecessors, with emphasis on socio-political systems, economic patterns, religion, and esthetic and intellectual achievements.

Mr. Nicholson

**123D. Ancient Civilizations of Eastern Middle America (Maya Sphere).**

(Formerly numbered 133B.) Prerequisite: courses 5A-5B-5C or course 22 or consent of the instructor. Pre-Hispanic and Conquest period native cultures of eastern Middle America as revealed by archeology and early colonial writings in Spanish and Indian languages. Lowland and Highland Maya civilizations and their predecessors, with emphasis on socio-political systems, economic patterns, religion, and esthetic and intellectual achievements. Mr. Donnan

**123E. Ancient Civilizations of Andean South America.**

(Formerly numbered 134.) Prerequisite: courses 5A-5B-5C or course 22 or consent of the instructor.

Pre-Hispanic and Conquest period native cultures of Andean South America as revealed by archeology and early Spanish writings. The Inca and their predecessors in Peru, with emphasis on socio-political systems, economic patterns, religion, and esthetic and intellectual achievements. Mr. Nicholson

**GROUP III. BIOLOGY AND CULTURE**

An examination of the biological factors in human variability, both behavioral and physical, and the operation of biological factors within a cultural setting.

**130A-130B. The Genetics of Race.**

(Formerly numbered 151A-151B.) Course 130A is prerequisite to 130B. No credit will be allowed for course 130A without course 130B. A general survey of the techniques and problems of racial classification. Emphasis is on the genetic approach. The methods of modern classical genetics and population genetics are applied to human evolution. Mr. Birdsell

**131. Evolution and Biology of Human Behavior.**

(Formerly numbered 152.) A comparative survey of the behavior patterns of preliterate and Paleolithic peoples and those of non-human primates. The biological variables fundamental to human and prehuman behavior will be assessed with regard to theories on the evolution of human culture.

**132. Comparative Morpho-Physiology of the Higher Primates.**

(Formerly numbered 153.) Lecture, two hours; laboratory, three hours. The comparative anatomy of monkeys, apes and man will be surveyed. The methods and data prerequisite to the interpretation of the primate fossil records will be discussed.

**133. Human Evolutionary Biology.**

Prerequisite: Anthropology 1A-B or Anthropology 11. Examination of the biological and physiological diversity in human populations in terms of human evolution and of short term adaptation to various environments. Mr. Ackerman

**GROUP IV. SOCIAL SYSTEMATICS I.**

Courses which focus on the interpretation or explanation of some type of code, symbol system, or behavior pattern and where the central analytic constructs are symbols, personality processes or interactional dynamics, and where theory is concerned with the relationship between the individual and his interactional setting. Anthropology students may also fulfill Group IV requirements by taking Linguistics 100.

**140. Comparative Religion.**

(Formerly numbered 124.) The origins, elements, forms and symbolism of religion; the role of religion in society. Mr. Lessa, Mr. Newman

**141. Oral Art and Drama of Non-Western Peoples.**

(Formerly numbered 145. Same as Folklore 145.) Various genres of oral art found among non-Western peoples including myth, legend, proverb, riddle, song text and ritual drama; social functions of oral art; role of the innovator; dynamics of stability and change in oral art; various classical theories of folklore.

**142. Musical Arts of Non-Western Peoples.**

(Formerly numbered 146. Same as Folklore 146.) Music as an aspect of culture in various non-Western societies. Native ideas about music and systems of criticism. The social functions of music. Music in relation to anthropological theories of symbolic behavior, enculturation, innovation, unconscious patterning, and culture history.

**143. Primitive Art.**

(Formerly numbered 127.) Development and change of conventions of visual art forms of various nonliterate peoples; effects of craftsmanship, materials and local culture on primitive art. Mr. Oswalt

**144. The Theory of Oral Literature.**

(Formerly numbered 148. Same as Folklore 143.) The historical development of the study of oral literature among preliterate people; theoretical bases for the analysis of oral traditions.

**145. Culture and Personality.**

(Formerly numbered 123.) Prerequisites: Psychology 10 and either courses 5A-5B or Sociology 1. Theories of the relationship between personality and culture. The development of such theories in the history of anthropology. The relationship of culture and personality research to general social and cultural research. A review of the modern sub-field of psychological anthropology.

Mr. Edgerton, Mr. Robbins

**Language\*****146. Language in Culture.**

(Formerly numbered 110. Same as Linguistics 190.) The study of language as an aspect of culture; the relation of habitual thought and behavior to language; the problem of meaning. Miss McClaran

**147. Behavioral Anthropology.**

An interdisciplinary approach to explanation and/or prediction of human behavior and system characteristics which employs various theoretical models (anthropological, psychological, sociological) and alternative hypotheses in natural laboratories constructed out of empirically collected data.

**GROUP V. SOCIAL SYSTEMATICS II.**

Courses which focus on the explanation of some type of institution or social system, where the central analytic constructs are groups, roles, norms, and societies, and where theory is concerned with the development and maintenance of human groups or networks.

**150. Social Anthropology.**

(Formerly numbered 161.) Prerequisite: courses 5A-5B-5C or course 22 or Sociology 1 or 101 and upper division standing in anthropology or sociology. Formal presentation of the methods, aims and development of social anthropology. Analysis of culture within systems of social relationships. Emphasis on structural-functional approach and the process of social change.

Mrs. Kuper

\* Graduate students in anthropology who propose to specialize in linguistics must take Linguistics 100 plus graduate courses in linguistics chosen from Linguistics 200A-205B and 210A-210B in consultation with an adviser; or they may take the M.A. in linguistics together with the Ph.D. in anthropology.

**151. Kinship and Social Organization.**

(Formerly numbered 128.) Prerequisite: courses 5A-5B-5C or course 22. Kinship systems, principally in non-Western societies, and their significance in the organization of social life. Theories of kinship, marriage regulations, and kinship role patterns.

Mr. Leaf

**152. Traditional Political Systems.**

(Formerly numbered 122.) Prerequisite: course 122A or Sociology 101 or consent of the instructor. Political organization in pre-industrial societies of varying degrees of complexity. Law and the maintenance of order; corporate groups; ideology. The relations of political to other institutions of society.

The Staff

**153. Economic Anthropology.**

(Formerly numbered 129.) A survey of the ethnology and ethnography of economic life, principally in non-Western societies, with an emphasis on the operation of systems of production and distribution within diverse cultural contexts.

Mr. Woods

**GROUP VI. CONTEMPORARY PROBLEMS**

This group includes those courses (taught from any point of view and with any subject matter) which are concerned with application of anthropological techniques and methods to problems of contemporary interest in our own society or which arise as a product of the contact between our society and others.

**160. Urban Anthropology.**

(Formerly numbered 149.) Prerequisite: consent of the instructor. The evolution, structure, systemics and culture of the city as artifact and environment for its component individuals, status groups and communities, explored in terms of the methods and perspectives of anthropology.

Mr. Rodgers, Mr. Snyder

**161. Development Anthropology.**

(Formerly numbered 166.) Prerequisites: courses 5A-5B-5C and upper division standing or consent of the instructor. An anthropological perspective on the problems of development in formerly primitive or peasant societies and the cultural factors in planning economic and social institutions in emergent national entities. The cultural and social implications of continuing development in industrial societies will also be examined.

Mr. Moerman

**162. Afro-American Culture.**

(Formerly numbered 167.) Prerequisite: upper division standing or consent of the instructor. Present day cultural characteristics of rural and urban Black Americans; the historical and contemporary forces in the formation of Afro-American culture.

**GROUP VII. TECHNIQUES AND METHODS**

Techniques are thought of as procedures in gathering or manipulating data; methods are thought of as concerned with problems of inference and validation. The following courses deal with one or both concerns. They are intended for majors and graduate students in anthropology. Anthropology students may also fulfill Group VII requirements by taking Linguistics 110 and Indo-European Studies 149.

**170. Field Training in Ethnology. (1 to 2 courses)**

(Formerly numbered 180.) Prerequisite: consent of the instructor. No other course may be taken concurrently. Introduction to ethnographic field methods involving participation in field studies among various ethnic groups. Students will spend most of the period in off-campus research activities. More than one section of the course may be given concurrently in different research sites. The Staff

**171A-171B. Laboratory Methods in Physical****Anthropology.**

(Formerly numbered 184A-184B.) Lecture, one hour; laboratory, four hours. Prerequisite: courses 1A-1B and consent of the instructor. Laboratory methodology and analysis of human variation on skeletal material (171A) and on living populations (171B). Mr. Birdsell, Mr. Williams

**173. Quantitative Methods in Anthropology.**

(Formerly numbered 186.) An introduction to sampling statistics with an emphasis on anthropological data. Statistical inference, common sampling distributions, tests on hypotheses, estimation, parametric and nonparametric methods will be introduced. Mr. Leaf, Mr. Rodgers, Mr. Williams

**174. Laboratory Methods in Technology and Invention.**

(Formerly numbered 187.) Prerequisite: course 122C and consent of the instructor. Intensive experimentation in the technology of nonliterate people. Mr. Donnan

**175A-175B. Strategy of Archeology.**

(Formerly numbered 138A-138B.) Prerequisite: course 5B. Course 175A is prerequisite to 175B. An introduction to research design in the cultural interpretation of archeological materials, with special emphasis on the techniques of laboratory analysis and data-processing. The history and contemporary developments of archeological research in both the Old and New Worlds are reviewed as part of the course. Mr. Meighan, Mr. Sackett

**175C. Dating Techniques in Archeology and History.**

(Formerly numbered 139; same as History 107.) Introduction to radioisotopic dating techniques, relative dating techniques and applicable methods in biological sciences, chemistry, geophysics and history. Prerequisites: upper division standing and basic physical science courses. Mr. Berger

**175D. Methods and Techniques of Field Archeology.**

(Formerly numbered 181.) Prerequisite: consent of the instructor. Brief introduction to archeological problems, theories and methods; archaeological survey, excavation, mapping, recording; introduction to data analysis and publication. May be repeated once for credit. During most of the quarter, Saturdays (8:00-5:00) will be spent in the field. Mr. Hill

**175E. Laboratory Analysis in Archaeology.**

(Formerly numbered 182.) Lecture, two hours; laboratory, four hours. Prerequisite: consent of the instructor. Description and classification of archaeological collections—cataloging, typology, documentation. Preparation of archaeological reports for publication.

**175F. Field Training in Archeology. (1 to 2 courses)**

(Formerly numbered 183.) Prerequisite: consent of the instructor. No other courses may be taken

concurrently. Introduction to archeological field methods involving participation in actual site excavation during the entire session. More than one section of the course may be given concurrently in different research sites. The Staff

**GROUP VIII. ANTHROPOLOGY AS A PROFESSION**

This group contains historical surveys of anthropology or its subfields and courses concerned with professional preparation.

**182A-182B. History of Anthropology.**

(Formerly numbered 162A-162B.) Prerequisite: senior major or graduate status in anthropology. Prerequisite to graduate work in the theory and method of anthropology. Course 182A is prerequisite to 182B. A systematic survey of the development of anthropology as a scientific field, especially designed for majors in anthropology and sociology. Mr. Epstein

**183. History of Archeology.**

(Formerly numbered 163.) The intellectual history of archeology from the ancient world to the present. Although each of its major traditions is reviewed, particular emphasis is given to those branches of archeology that have evolved during the last century within the discipline of anthropology. Mr. Sackett

**SPECIAL COURSES****198. Special Courses.**

Special topical or regional studies to be offered to the extent justified by student demand or the presence of special visitors. The Staff

**199. Special Studies in Anthropology.**

( $\frac{1}{4}$  to 2 courses)

Prerequisite: senior standing in anthropology and consent of the instructor. Two courses of 199 may be applied to the ten courses required for the major. The Staff

Graduate Courses\*

**202. Ethnology. (1  $\frac{1}{2}$  courses)**

Intensive examination of current theoretical views; research methods; modern form of analysis. Mr. Edgerton, Mr. Rodgers

**203. Cultures of Asia.**

Survey of literature and problems of selected areas of Asia. Mr. Moerman

**204. Pacific Island Cultures.**

Survey of literature and problems of the Pacific Islands. Mr. Lessa

**205. North American Indians.**

Survey of the literature and problems of the American Indians north of Mexico. Mr. Oswalt

**207. Indians of South America.**

Survey of the literature and problems of the Indians of South America. Mr. Willbert

**208. African Cultures.**

Survey of literature and problems of African culture. Mrs. Kuper

**209. Cultures of the Soviet Union.**

Literature and problems of the peoples of the Soviet Union.

\* Graduate students may take Linguistics 220F and 220G and receive credit towards the 36 units required for the M.A. degree.

**212. Anthropological Linguistics. (1½ courses)**

Prerequisite: course 112 or its equivalent. The development of anthropological linguistics, modern linguistic theory and its application to the study of nonlinguistic aspects of culture, including relationship of language to world view; comparative historical linguistics; lexico-statistics; semantic analysis; linguistic acculturation; and socio- and ethnolinguistics. Mr. Hojjer

**220. Social Anthropology.**

Intensive examination of current theoretical views and literature. Mrs. Kuper

**221. Social Movements and Social Crisis.**

Prerequisite: consent of the instructor. The emergence of social movements of difference types, whether millennial, nationalist, reformist, political, etc., particularly as in situations of social conflict and crisis. Movements of rebellion and revolution examined in the light of anthropological and sociological theory focusing on a broad range of problems. Mr. Gilseman

**222A-222B-222C. Research Methods and Procedures.**

Lecture, three hours. An integrated review of the research methods in anthropological inquiry focusing on problem formulation, methods of setting up testable hypotheses, the kinds of data available for anthropological explanation, statistical and nonstatistical means of "explanation" in anthropology. Each part may be taken independently. Mr. Graves

**230. Analytical Methods in Archeological Studies.**

Mr. Hill

**231. Technology Laboratory.**

Prerequisite: course 126 or consent of the instructor. The intensive study of elementary technological principles through experimentation. Mr. Hill

**232. Archeology. (1½ courses)**

Lecture, three hours. A review of the history of archeology and the basic techniques of archeological investigation and analysis as these have established the present state of knowledge of major prehistoric periods in diverse parts of the world. Mr. Sackett

**240. Current Problems in Physical Anthropology.**

A detailed examination of present, on-going research by physical anthropologists in order to determine the direction and place of physical anthropology in the general discipline of anthropology. Mr. Williams

**242. Physical Anthropology. (1½ courses)**

Lecture, three hours. The examination of the concepts, methods, and problems in physical anthropology with respect to man's evolutionary past, and the evolutionary biology of living human populations. The last part to be conducted as a seminar on current literature. Mr. Williams

**246. Population Genetics of Man.**

(Formerly numbered 159.) Prerequisite: 1A-1B. Recommended: an introductory course in statistics. The study of population concepts, probability, the conditions of gene frequency equilibria and factors causing gene frequency change. Mr. Williams

Because the following courses numbered 250 and above are nonrepetitive in content, the Graduate Council has ruled that they

may be repeated for credit on recommendation of the graduate adviser.

**252. Selected Topics in Ethnology.**

Prerequisite: consent of the instructor. Mr. Wilbert

**253. Selected Topics in Cultures of Asia.**

Prerequisite: consent of the instructor. Emphasis on different subcultural areas will vary in accordance with the instructor. Mr. Hockings, Mr. Moerman

**254. Selected Topics in Cultures of the Pacific Islands.**

Prerequisite: consent of the instructor. Mr. Lessa, Mr. Newman

**255A-255B. North American Indians.**

Prerequisite: consent of the instructor. Credit to be given only at the completion of 255B. The full sequence may be repeated for credit. Mr. Oswalt

**256. Selected Topics in Arctic Cultures.**

Prerequisite: consent of the instructor. Mr. Oswalt

**257. Indians of South America.**

Prerequisite: consent of the instructor. Mr. Wilbert

**258. Selected Topics in African Cultures.**

Prerequisite: consent of the instructor. Mrs. Kuper

**259. Selected Topics in Cultures of the Soviet Union.**

Prerequisite: consent of the instructor.

**260. Mediterranean Society and the Arab World.****261. Selected Topics in Myth and Ritual.**

Prerequisite: consent of the instructor. Mrs. Kuper, Mr. Lessa, Mr. Newman

**262. The Individual in Culture: Selected Topics.****263. Ethnolinguistics.**

Prerequisite: consent of the instructor. Problems in the relations of language to culture; structural semantics; language and prehistory. Mr. Bright

**264. Selected Topics in Higher Cultures of Nuclear America.**

Prerequisite: consent of the instructor. Mr. Nicholson

**265A-265B. Contemporary Latin American Problems.**

Prerequisite: consent of the instructor. Preference is given to students with a reading knowledge of Spanish or Portuguese. Credit to be given only at the completion of 265B. The full sequence may be repeated for credit. The Staff

**266. Selected Topics in Culture and Personality.**

Mr. Robbins, Mr. Schwartz

**267. Selected Topics in Culture Change.**

Prerequisite: consent of the instructor. Mr. Moerman

**268A-268B. European Archeology.**

(Same as Indo-European Studies 250A-250B.) Prerequisite: consent of the instructor. Credit to be given at the completion of 268B. The full sequence may be repeated for credit. Studies in ancient European archeological materials, and their relationship to those of the Near East, Western Siberia, and Central Asia. Mrs. Gimbutas

**269. Selected Topics in African Arts.**

Prerequisite: consent of the instructor.

**270A-270B-270C. Documentary Film.**

(Same as Theater Arts 209C, 265A, 265B respectively.) Lecture, two hours. Prerequisites: consent of the instructor. Course 270A is prerequisite to courses 270B and 270C. A study of the possibilities and problems in the use of motion picture techniques for ethnographic documentation, analysis, and instruction. Examination of selected ethnographic films. Subsequent field work for selected students.

**271. Selected Topics in Historical Reconstruction and Archeology.**

Prerequisite: consent of the instructor. Interpretation of historical development through archeological research. Application of ethnohistory to archeological problems. Mr. Meighan, Mr. Nicholson

**272. Selected Topics in Prehistoric Nonagricultural Societies.**

Prerequisite: consent of the instructor. Regional studies in the development of early human culture. Mr. Meighan

**273. Problems in Old World Archeology: Selected Topics.**

Prerequisite: consent of the instructor. Mr. Sackett

**274. Selected Topics in Prehistoric Civilizations of the New World.**

Prerequisite: consent of the instructor. Mr. Nicholson

**275. Selected Topics in Principles of Human Ecology.**

Prerequisite: consent of the instructor. Mr. Birdsell

**276. Current Problems in Population Genetics: Selected Topics.**

Prerequisite: consent of the instructor. A consideration of some of the special methods of the genetics of human populations and their current application in research. Mr. Williams

**277. Human Microevolution.**

Prerequisite: consent of the instructor. Mr. Birdsell

**278. Problems in Southwestern Archeology.**

A consideration of prehistoric cultural systems in the American Southwest, with emphasis on the description and explanation of organizational variability and change. Examination of the historical development of major theories, problems and methodologies. Mr. Hill

**280. Selected Topics in Field Training in Ethnography. (1 to 2 courses)**

Prerequisite: consent of the instructor. Supervised collection of ethnographic information in the field. To be offered only in summers. Students will spend full time in the field for most of the period. The Staff

**281. Selected Topics in Childhood and Society. (1 to 2 courses)**

Lecture, two hours. Prerequisite: consent of the instructor. An examination of the relationship between childhood experiences and institutionalized adult behavior and beliefs. Mr. Robbins

**282. Selected Topics in Dating Techniques in Archeology and History. (1 to 2 courses)**

A colloquium devoted to topics in dating techniques in archaeology and history as well as laboratory instruction and experimental work. Prerequisite: consent of the instructor. Mr. Berger

**283. Selected Topics in Field Training in Archeology. (1 to 2 courses)**

Prerequisite: previous experience in archeology. Advanced training in archeological excavation techniques, including organization of projects, supervision of field crews, methodology of field recording and preliminary analysis of field data. To be offered in summers only. The Staff

**284. Selected Topics in Cultural Ecology.**

Prerequisite: consent of the instructor. Mr. Rodgers

**285. Special Topics in Social Anthropology.**

Prerequisite: consent of the instructor. Mrs. Kuper

**286. Selected Topics in Problems in Cultural Anthropology.**

Prerequisite: consent of the instructor. Mr. Goldschmidt

**287. Selected Topics in Kinship.**

Prerequisite: consent of the instructor. Mrs. Kuper

**288. Selected Topics in Comparative Political Institutions.**

Prerequisite: consent of the instructor.

**289. Selected Topics in Economic Anthropology.**

Prerequisite: consent of the instructor.

**290A-290B. Methods in Psychological Anthropology.**

Prerequisites: adequate background in psychology in fields of personality, clinical psychology and psychological testing, as evaluated by the instructor. Credit to be given only at completion of 290B. The full sequence may be repeated for credit. The methods of study of aspects of personality, perception, cognition, and mental health as applicable to non-Western and particularly primitive cultures. 290A deals with methods other than testing. 290B deals with diverse standardized tests applicable in cross-cultural research. Mr. Edgerton, Mr. Schwartz

**291. Urban Anthropology.**

Prerequisite: Course 149 or consent of the instructor. Mr. Rodgers, Mr. Snyder

**292. Research Methods in Community Health.**

(Same as Public Health 245A.) Prerequisite: Public Health 160A, 147 or 246A, or consent of the instructor. Preparation for planning and conducting research projects; methods and techniques of community health research. This course is designed to provide the basic skills in research methodology for studies.

**293. Analysis of Field Data.**

Supervised analysis of ethnographic materials by students who have participated in a related field training course. Students will work with their own as well as general project data in the preparation of articles for professional journals. Prerequisites: course 280 or other field training course. The Staff

**294. Research Colloquium.**

A context for the presentation of graduate field reports and research reports. On successful completion of his qualifying examinations, each graduate student will register in this course for at least one quarter to present his research report. Satisfactory/Unsatisfactory grades only will be assigned. The Staff

Individual Study and Research

**596. Individual Studies for Graduate Students.**

(¼ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**597. Preparation for the Master's Comprehensive Examination or the Doctoral Qualifying Examination. (½ to 2 courses)**

Prerequisite: consent of the instructor. Preparation for the comprehensive examination for the master's degree or the qualifying examination for the Ph.D. The Staff

**599. Research for Dissertation. (¼ to 2 courses).**

Ph.D. dissertation research or writing. Student will have completed qualifying examination and ordinarily will take no other course work. The Staff

**■ ARCHITECTURE AND URBAN PLANNING**

(Department Office, 1118 Architecture Building)

Leland S. Burns, Ph.D., *Professor of Planning (Associate Dean).*

John Friedmann, Ph.D., *Professor of Planning (Head, Urban Planning Program).*

Harvey S. Perloff, Ph.D., *Professor of Planning (Dean and Chairman of Department).*

Thomas R. Vreeland, B.Arch., *Professor of Architecture (Head, Architecture and Urban Design Programs)*

Peter Kamnitzer, M.Arch., M.C.P., *Associate Professor of Planning.*

Murray A. Milne, M.S., M.Arch., *Associate Professor of Architecture.*

Charles W. Rusch, M.Arch., *Associate Professor of Architecture.*

Charles N. Ehler, M.C.P., *Assistant Professor of Urban Design.*

†Bernhard H. Hafner, M.Arch. (U.D.), *Assistant Professor of Urban Design.*

Frank Eugene Kupper, M.Arch., *Assistant Professor of Architecture.*

Helmut C. Schulitz, M.Arch. (U.D.), *Assistant Professor of Urban Design.*

◇

Marvin Adelson, Ph.D., *Lecturer in Architecture.*

Calvin Hamilton, B.F.A., M.C.P., *Lecturer in Planning.*

Leroy Higginbotham, B.A., *Lecturer in Planning.*

Sharon L. Kaufman, M.D., *Lecturer in Planning.*

◇

Peter Orleans, M.S., Ph.D., *Associate Professor in Sociology.*

**Architecture and Urban Design****Seminars****202A-202B. Decision Making in Planning and Design.**

Definitions of the decision process; knowledge and evidence; techniques; the context of decision-making; consequences of a decision; action management. Mr. Adelson, Mr. Kupper

**205. Fundamentals of Design Method.**

Systematic methods in design: Approaches and philosophies of design; scheduling of design tasks; techniques, communication, and media. Readings, Seminars, projects. Mr. Kupper

**206. Cognitive Processes in Design.**

(Formerly numbered 414.) Review of concepts of perception and conception (e.g., imagery, reasoning, memory, representation, communication) as they apply to the design process; special emphasis on the role of visual and schematic thinking in design problem solving. Mr. Rusch

† Absent on leave, 1970-1971.

**216. Obsolescence, Change and Growth in Urban and Architectural Systems.**

Prerequisite: consent of the instructor. Time dimension in urbanism and architecture—historical viewpoints, development in art and science; evolution versus revolution; urban and architectural growth versus growth in nature; obsolescence; determinate assemblage versus indeterminate assemblage; building systems. Mr. Schulitz

**218. Theory of Urban Structure.**

Prerequisite: consent of the instructor. Part I: state of the art of the profession; history and development of knowledge; Part II: introduction to information theory and cybernetics; Part III: urban structure and behavior; Part IV: location theory, etc. Mr. Hafner, Mr. Rabin

**275. Environmental Impacts on New Technology.**

Impacts of technology in the context of environment; interaction of technology and environmental processes; opportunities and negatives implicit in emerging technologies; transfer of technologies to environment; obstacles to environmental innovation. Mr. Ehler

**285. Image and Cultural Symbolization.**

Prerequisite: consent of the instructor. This seminar will examine the purely communicative aspects of the visually perceived environment by means of readings, discussion, experimentation, and observation. Mr. Milne, Mr. Vreeland

**410. Computer Applications.**

Introduction to electronic computers and to Fortran and other programming languages, with emphasis on writing and executing programs specifically applicable to architecture, urban design, and planning. Mr. Milne

**423. Materials and Manufacturing Processes.**

Prerequisite: consent of the instructor. Manufacturing processes and materials in modern industry and their application to building technology. New fabrication techniques and structural possibilities. Laboratories experimentation and testing. Mr. Lindsay

Projects

**401. Projects in Architecture.**

(Formerly numbered 451-453.) Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**402. Projects in Urban Design.**

(Formerly numbered 401-403.) Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**490. Environmental Design Workshop.**

(1 to 2 courses)

Prerequisite: consent of the Workshop Staff. Applied research and development work in the Environmental Design Workshop under the supervision of the workshop staff. Client-oriented projects concerned with significant urban, social or technical problems of the physical environment. May be repeated for credit. The Staff

**496. Special Projects in Architecture.**

(1 to 2 courses)

Prerequisite: consent of the instructor. The Staff

**497. Special Projects in Urban Design.**

(½ to 2 courses)

The Staff

Individual Studies

**596A. Directed Individual Research and Study in Architecture. (½ to 2 courses)**

May be repeated for credit. The Staff

**596P. Research in Planning. (1 to 2 courses)**

Directed individual study or research in Urban Planning.

**596UD. Directed Individual Research and Study in Urban Design. (½ to 2 courses)**

May be repeated for credit. The Staff

**597A. Preparation in Architecture for the Comprehensive Examination for the Master's Degree. (½ to 2 courses)**

Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**597UD. Preparation in Urban Design for the Comprehensive Examination for the Master's Degree. (½ to 2 courses)**

Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**598A. Preparation in Architecture for the Master's Thesis. (½ to 2 courses)**

Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**598P. Master's Thesis Research in Planning. (1 to 2 courses)**

**598UD. Preparation in Urban Design for the Master's Thesis. (½ to 2 courses)**

Prerequisite: consent of the instructor. May be repeated for credit. The Staff

**599P. Dissertation Research in Planning. (1 to 2 courses)**

Research for and preparation of the doctoral dissertation.

**Planning**

General (or Core) Courses

**200. Introduction to Planning Theory.**

(Formerly numbered 210.) Types of planning and their interaction in system guidance; case studies of national, regional and local planning; development of hypotheses for planning research; the role of the planner as an agent of change as conditioned by the cultural and institutional environment. Mr. Friedmann

**201. Theory and Art of Advice.**

Prerequisite: course 200 or consent of instructor. The planner as an agent of change. Technical assistance and advisory relationships with client groups. Institutional development and interactive approaches. Planning as mutual learning. Case studies and simulation. Mr. Friedmann, Miss Kaufman

**209. Research in Planning Theory.**

Prerequisite: course 200 or consent of instructor. Research seminar on selected topics in planning theory. May be repeated for credit. The Staff

**210. Introduction to Urban Theory.**

(Formerly numbered 212.) The changing ecological structure of the American city and consideration of the technological, economic and social forces accounting for these changes; ecological and location theories; accelerated urbanization; large scale urban systems. Mr. Burns, Mr. Perloff

**211. The City and the Planner: Current Issues and Future Problems. (½ to 1 course)**

Emerging roles of professional work in planning for urban-regional development in postindustrial society and their implications for planning education. Mr. Kamnitzer and Staff

**212. Urban Morphology: Definitions and Consequences.**

Prerequisite: course 210 or consent of instructor. Research seminar on theories and methods of determining the territorial and normative aspects of urban structure and assessing their significance for behavior. Discussion of implications for social planning and urban design. Mr. Orleans

**213. Comparative Community Political Systems.**

(Same as Political Science 224H.) Prerequisite: course 210 or consent of instructor. Critical evaluation of the literature on community power and secondary analysis of data from extant research (primarily American but increasingly comparative.) Special attention to power distributions, leadership recruitment, and public and private decision-making. Mr. Scoble

**214. Urbanization and National Development.**

Prerequisite: course 210 or consent of instructor. Demographic and socioeconomic aspects of urbanization. Evolution of urban and regional systems. Consequences of accelerated urbanization. The role of cities in national development. National urbanization policies. Mr. Friedmann

**219. Research in Urban Theory. (½ to 1 course)**

Prerequisite: course 210 or consent of instructor. Research seminar on selected topics in urban theory. May be repeated for credit. The Staff

**220. Analytic Methods for Planning.**

(Formerly numbered 213.) Introduction to computer language, linear models, statistical inference, and simulation-gaming, providing analytical skills for understanding systems simulation models. Mr. Ehler

**221. Introduction to Planning Analysis.**

Prerequisite: course 220 or consent of instructor. Introduction to modelling methods for urban analysis. Mr. Hafner

**222. Studies of the Future and Forecasting Methods.**

Prerequisite: course 221 or consent of instructor. Forecasting techniques in planning and design, their uses and limitations. Mr. Ehler

**223. Computer Graphics and Man-gaming.**

Prerequisite: course 221 or consent of instructor. Computer graphics and man-gaming as aids to design and decision-making. Information display techniques; use for evaluation of alternative proposals; man-machine dialogue; utilization for decision-making. Mr. Kamnitzer

**229. Research in Methods for Planning. (½ to 1 course)**

Prerequisite: course 221 or consent of instructor. Research seminar on selected topics in planning methodology. May be repeated for credit. The Staff

**Areas of Policy Concentration****230. Introduction to Urban and Regional Development Policy.**

The scale problem in policy analysis for area development. Policy issues at each scale and means of instrumentation. Frame works for policy analysis; development theory; the center-periphery model; location theory. Strategy approaches to urban-regional development. Mr. Friedmann

**231A. Planning for Urban-Regional Growth: Theories of Growth.**

Prerequisite: course 230 or consent of instructor. Theories of urban and regional economic growth. Empirical studies of regional growth experience in the United States and abroad. Regional growth models. Social, political and cultural correlates of urban-regional growth and stagnation. The Staff

**231B. Planning for Urban-Regional Growth: Urban Development and Renewal.**

Prerequisite: course 230 or consent of instructor. Policies and program for stimulating local development in the context of alternative goals. Relationship between urban renewal and human resource development. Emphasis on intra-urban problems. Mr. Burns

**231C. Planning for Urban-Regional Growth: Regional Development Policy for Industrializing Countries.**

Prerequisite: course 230 or consent of instructor. A survey of concepts and criteria for regional delineation. Models of development for different types of regions. Integration of subnational with national development approaches. Case studies. Mr. Friedmann

**232. Indicators and Social Reports for Metropolitan Regions.**

Prerequisite: course 230 or consent of instructor. Research seminar concerned with the development of meaningful indicators for evaluating and reporting the performance of complex urban systems. Mr. Perloff

**233. Location Theory.**

Prerequisite: course 230 or consent of instructor. Economic and geographic location theory. Location decisions of manufacturing firms, households, public facilities, and services. Central place theory; gravity models; industrial complex analysis. Determinants of urban and regional land use allocation. The Staff

**239. Research in Urban and Regional Development Policy. (½ to 1 course)**

Prerequisite: course 230 or consent of instructor. Research seminar on selected topics in urban and regional development policy. May be repeated for credit. The Staff

**240. Introduction to Planning for Public Service Systems.**

A survey course in planning for the development of public service systems to include fields of health, education, transportation, recreation, and utilities. Emphasis on economic and organizational approaches. The Staff

**241. Evaluation of Public Service Systems.**

Prerequisite: course 240 or consent of instructor. Techniques for the evaluation of projects, programs, and organizational effectiveness; benefit-cost analysis; programming-planning-budgeting systems; critical path methods; system design and comparison. The Staff

**242. Public Service Systems: Institutional Performance and Design.**

Prerequisite: course 240 or consent of instructor. Institutions as guidance systems; organizational influences on service quality; competition in public services; institutional alternatives; design criteria and strategies in organizational change. The Staff

**249. Research in Public Service Systems. (½ to 1 course)**

Prerequisite: course 240 or consent of instructor. Research seminar on selected topics in planning for public service systems. The Staff



**250. Issues in Social Development Policy.**

Comparative perspectives on social development policies. Linkages between social, economic, and physical development. Dimensions of social development policy as a newly emerging field of study.

The Staff

**251A. Human Development.**

Prerequisite: course 250 or consent of instructor. The human individual's development in interaction with personal and physical environments. Experience patterns fostering competence. Sources and handling of conflict. Perception, communication, and "problem solving" in the personal and social sphere.

Miss Kaufman

**251B. Human Development.**

Prerequisite: course 251A. Role and structure, function, and systems on different levels of social organization. Group life, values, beliefs, and belief systems. Culture loss and growth related to innovation.

Miss Kaufman

**259. Research in Social Development Policy.**

Prerequisite: consent of instructor. Research seminar on selected topics in social development. May be repeated for credit.

The Staff

**269. Research in Urban Design. (½ to 1 course)**

Prerequisite: consent of instructor. Research seminar on selected topics in urban design. May be repeated for credit.

The Staff

General Research Courses

**596P. Research in Planning. (1 to 2 courses)**

Directed individual study or research in Urban Planning.

**598P. Master's Thesis Research in Planning. (1 to 2 courses)**

**599P. Dissertation Research in Planning. (1 to 2 courses)**

Research for and preparation of the doctoral dissertation.

**ART**

(Department Office, 1300 Dickson Art Center)

Karl M. Birkmeyer, Ph.D., *Professor of Art.*

E. Maurice Bloch, Ph.D., *Professor of Art and Curator of Graphic Arts.*

William J. Brice, *Professor of Art.*

J. LeRoy Davidson, Ph.D., *Professor of Art (Chairman of the Department).*

Richard Diebenkorn, M.A., *Professor of Art.*

Henry Dreyfuss, *Adjunct Professor of Art.*

Archine V. Fetty, M.A., *Professor of Art.*

Thomas Jennings, M.A., *Professor of Art.*

Lester D. Longman, Ph.D., L.H.D., D.F.A., *Professor of Art.*

Gordon M. Nunes, M.A., *Professor of Art.*

Katharina Otto-Dorn, Ph.D., *Professor of Art.*

Jan Stussy, M.F.A., *Professor of Art.*

Laura F. Andreson, M.A., *Emeritus Professor of Art.*

Dorothy W. Brown, A.B., *Emeritus Professor of Art.*

Annita Delano, *Emeritus Professor of Art.*

Josephine P. Reys, *Emeritus Professor of Art.*

Frederick S. Wight, M.A., *Emeritus Professor of Art and Director of Art Galleries.*

Karl E. With, Ph.D., D.F.A., *Emeritus Professor of Art.*

S. Macdonald Wright, *Emeritus Professor of Art.*

Samuel Amato, B.F.A., *Associate Professor of Art.*

Oliver W. Andrews, A.B., *Associate Professor of Art.*

Alexander Badawy, B.Arch., D.I.A., Ph.D., *Associate Professor of Art.*

Jack B. Carter, M.A., *Associate Professor of Art.*

Elliot J. Elgart, M.F.A., *Associate Professor of Art.*

Robert F. Heinecken, M.A., *Associate Professor of Art.*

J. Bernard Kester, M.A., *Associate Professor of Art.*

Lee Mullican, *Associate Professor of Art.*

Carlo Pedretti, M.A., *Associate Professor of Art.*

Nathan Shapira, Dottore in Architettura, *Associate Professor of Art.*

Otto-Karl Werckmeister, Ph.D., *Associate Professor of Art.*

Helen Clark Chandler, *Emeritus Associate Professor of Art.*

Melvin Best, M.A., *Assistant Professor of Art.*

Leslie Biller, M.A., *Assistant Professor of Art.*  
 Raymond B. Brown, M.A., *Assistant Professor of Art.*  
 Hans Brummer, Ph.D., *Assistant Professor of Art.*  
 Susan B. Downey, Ph.D., *Assistant Professor of Art.*  
 Robert Fichter, M.F.A., *Assistant Professor of Art in Residence.*  
 Llyn Foulkes, *Assistant Professor of Art in Residence.*  
 George Foy, B.Arch., *Assistant Professor of Art.*  
 Mitsuru Kataoka, M.A., *Assistant Professor of Art.*  
 Eugene Kleinbauer, Ph.D., *Assistant Professor of Art.*  
 Alice E. M'Closkey, M.A., *Assistant Professor of Art.*  
 Velizar Mihich (Vasa), *Assistant Professor of Art.*  
 Donald Roberts, *Assistant Professor of Art.*  
 Arnold Rubin, Ph.D., *Assistant Professor of Art.*  
 Madeleine Boyce Sunkees, B.E., *Assistant Professor of Art.*  
 Edward H. Traynor, M.A., *Assistant Professor of Art.*  
 James Weeks, *Assistant Professor of Art in Residence.*  
 Richard Joseph, M.F.A., *Instructor of Art in Residence.*



William C. Brown, M.A., *Lecturer in Art.*  
 Christian A. Choate, B.Arch., *Lecturer in Art.*  
 David Gordon, B.Arch., *Lecturer in Art.*  
 Julius D. Kaplan, B.A., *Lecturer in Art.*  
 Stephen Kayser, Ph.D., *Lecturer in Art.*  
 Donald F. McCallum, B.A., *Acting Assistant Professor of Art.*  
 Rex Raymer, B.Arch., *Lecturer in Art.*  
 Joyce Treiman, B.F.A., *Lecturer in Art.*  
 Robert Wark, Ph.D., *Lecturer in Art.*  
 Jean Weisz, M.A., *Lecturer in Art.*  
 Marc Wurmbrand, M.F.A., *Lecturer in Art.*

It is recommended that each student majoring in art have each quarter's program approved by a departmental adviser.

The departmental major offered in the College of Fine Arts leads to the degree of Bachelor of Arts with the opportunity to specialize in one of three areas: (1) Art History, (2) Pictorial Arts, (3) Design.

#### Preparation for the Major

*Art History.* Courses 1A, 1B, 1C.

*Pictorial Arts.* Two courses selected from 1A, 1B, 1C; courses 10A, 10B, 20A, 20B, 25.

*Design.* Two courses selected from 1A, 1B, 1C; courses 30A, 30B; one course selected from 10A, 25, 1A, 1B, 1C.

#### The Major

*Art History.* A minimum of 17 upper division courses selected in consultation with an art history adviser, including one course from each of the following eight groups: 101A-104; 105A-105D; 106A-108B; 109A-109D; 110A-112B; 114A-116; 118A-119C;

120A-123B. Six courses in not more than two of the above groupings and three courses of art electives. Classics 151A-151B-151C, Anthropology 143, Oriental Languages 170A-170B-170C, or Philosophy 160 may be substituted for the art electives. Other related courses in anthropology, classics, literature, foreign languages, history, philosophy, music and theater arts are recommended as nonmajor electives for the degree. Course 124 is required of students who plan to pursue graduate work in art history.

*Pictorial Arts.* A minimum of 13 upper division courses selected in consultation with a pictorial arts adviser including one course each in courses 130, 132, 133, 135, 140, 145 and 147; two courses selected from courses 101-123 and four courses of art electives.

*Design.* A minimum of 15 upper division courses selected in consultation with a design adviser, including courses 150A-150B-150C, 151A-151D, four courses from 101-123B; and four courses of art electives.

### Admission to Graduate Status

In addition to meeting the requirements of the Graduate Division, the student will usually be expected to have a bachelor's degree in Art. Students whose preparation in Art is deficient as determined by the departmental adviser will be required to take additional work before proceeding with the graduate program.

### Requirements for the Master's Degree

For the general University requirements, see pages 153-154. The Department of Art offers graduate study in three areas of specialization: (1) History of Art, (2) Pictorial Arts, (3) Design. When applying for admission, it is advisable to designate the area of specialization.

**Art History.** The program for the Master of Arts degree in art history follows the Comprehensive Plan, a minimum of nine courses in art history (five courses in the 200 series, including course 201). The program for the degree is worked out under the guidance of the adviser in the area of specialization. Reading knowledge of at least one approved foreign language is required; this requirement must be fulfilled by the end of the third quarter. The Comprehensive Examination includes a six-hour written examination, half devoted to a major field and half to two minor fields. No formal thesis is required, but the student is required to present a paper in his major field, some fifty pages in length and requiring one quarter of full time work.

**Pictorial Arts or Design.** The master's program with these specializations follows the Comprehensive Examination Plan, a minimum of nine courses of graduate work including a minimum of five courses in the 200 series in the field of specialization. The final comprehensive examination is oral. Those majoring in pictorial arts may concentrate on painting, sculpture, printmaking or photography in their advanced project. Majors in design may stress graphic, industrial, environmental, costume, textile design or ceramics, but the ideal degree candidate is the comprehensive designer rather than the specialist. All candidates are expected to have a good general knowledge of the history and theory of art. The specific program for the Master of Arts degree is worked out under the guidance of a staff member in the area of the advanced project.

### Master of Fine Arts Degree in Pictorial Arts or Design

The program requires a minimum of 18 courses, with at least ten courses in the

200 series. Candidates must have completed, whether as undergraduates or graduate students, a minimum of ten courses in art history. The pictorial arts candidate must complete a minimum of 11 courses in the field of specialization (including 10 courses in the 200 series), and three courses in an advanced project. Candidates in the fields of design must complete a minimum of 13 courses in the field of specialization (including ten courses in the 200 series) and three courses in an advanced project. Students who have an M.A. degree may be accepted as candidates for the M.F.A., but the M.A. degree is not a prerequisite. The M.F.A. is the highest degree in course for prospective professional artists. Two to three years of graduate work will normally be required to complete the requirements in terms of quality of creative work.

### Doctor of Philosophy Degree in Art History

In addition to the general University regulations for the Doctor of Philosophy degree, including the dissertation and final examination (see page 156), a candidate must satisfy the following departmental requirements:

**Foreign Language.** A reading knowledge of German and French is requisite for all candidates. The chairman of the candidate's committee may advise an additional language. The requirements for the first language must be fulfilled by the end of the third quarter of graduate work, the requirement for the second language at the end of the fifth quarter. Both language requirements must be satisfied before advancement to candidacy for the degree.

**Qualifying Examination.** Preparation for the qualifying examination, which advances the student to candidacy, will include a minimum of five graduate seminars and a term paper demonstrating scholarly competence. The examination is both written and oral and may be combined with the master's examination if this intention is declared in advance.

#### Lower Division Courses

#### 1A. History of Art.

Lecture, three hours; quiz, one hour. Painting, sculpture, and architecture from prehistoric times to the year 1000. Miss Downey, Mr. Kayser

#### 1B. History of Art.

Lecture, three hours; quiz, one hour. Painting, sculpture, and architecture from the year 1000 to the year 1600.

Mr. Kayser, Mr. Kleinbauer, Mrs. Weitz

**1C. History of Art.**

Lecture, three hours; quiz, one hour. Painting, sculpture, and architecture from the year 1600 to the present.  
Mr. Kayser, Mrs. Weisz

**10A. Drawing.**

Studio, eight hours; six hours arranged. Beginning course in drawing.  
Mr. Brice, Mr. Joseph

**10B. Drawing.**

Studio, eight hours; six hours arranged. Prerequisite: course 10A. Beginning course in figure drawing.  
Mr. Biller, Mrs. Treiman

**20A. Painting.**

Studio, eight hours; six hours arranged. Prerequisite: courses 10A and 10B. Beginning course in painting.  
Mr. Joseph, Mr. Ruscha

**20B. Painting.**

Studio, eight hours; six hours arranged. Prerequisite: course 20A. Composition and color.  
Mr. Mullican, Mr. Ruscha

**25. Sculpture.**

Studio, eight hours; six hours arranged. Modeling and basic sculptural form.  
Mr. Andrews

**30A. Introduction to Design and Technology.**

Lecture, four hours. An introduction to the visual design process with emphasis on the development of visual awareness; a study of the technical, economic, environmental and cultural factors influencing the design of objects.  
Mr. Kester

**30B. Delineation.**

Studio, eight hours; five hours arranged. Exploration of the fundamentals of three dimensional structuring and their relation to appearance; expression of conceptual structures through delineation.  
Mr. Choate, Mr. Vasa

Related Courses in Other Departments

**Integrated Arts 1A-1B-1C.**

Upper Division Courses

**HISTORY AND THEORY OF ART****100A. History and Criticism of Art.**

Lecture, three hours; quiz, one hour. Not open to students having credit for 1A. Painting, sculpture and architecture from prehistoric time to the year 1000.

**100B. History and Criticism of Art.**

Lecture, three hours; quiz, one hour. Not open to students having credit for 1B. Painting, sculpture and architecture from the year 1000 to the year 1600.  
Mr. Longman

**100C. History and Criticism of Art.**

Lecture, three hours; quiz, one hour. Not open to students having credit for 1C. Painting, sculpture and architecture from the year 1600 to the present.  
Mr. Longman

**101A. Egyptian Art and Archaeology.**

(Formerly numbered 110F.) Lecture, three hours; quiz, one hour. A comprehensive study of art in Ancient Egypt from the earliest times to the Roman period, covering architecture, sculpture, graphic and minor arts. Relations with contemporaneous arts of the Aegean and Greece.  
Mr. Badawy

**101B. Egyptian Art and Archaeology.**

(Formerly numbered 110F.) Lecture, three hours; quiz, one hour. Prerequisite: course 101A. Continuation of 101A.  
Mr. Badawy

**101C. Egyptian Art and Archeology.**

(Formerly numbered 110F.) Lecture, three hours; quiz, one hour. Prerequisite: course 101B. Continuation of 101B.  
Mr. Badawy

**103B. Hellenistic Greek Art.**

Lecture, three hours; quiz, one hour. Miss Downey

**103C. Roman Art.**

Lecture, three hours; quiz, one hour. Miss Downey

**103D. Etruscan Art.**

Lecture, three hours; quiz, one hour. The arts of Italy from 1000 B.C. to the period of the Roman domination (about the 2nd century B.C.).  
Miss Downey

**104A. Art of the Ancient Near East.**

Lecture, three hours; quiz, one hour. Art and architecture of Mesopotamia, the Hittites and the Levant.  
Mr. Badawy

**104B-104C-104D. Architecture and the Minor Arts of Islam in the Middle Ages.**

Lecture, three hours; quiz, one hour. Prerequisites: course 104B for course 104C; course 104C for course 104D.  
Mrs. Otto-Dorn

**105A. Early Christian and Byzantine Art.**

(Formerly numbered 111E.) Lecture, three hours; quiz, one hour. Architecture, painting, sculpture of the early Christian and Byzantine periods to 1453.  
Mr. Kleinbauer

**105B. Early Medieval Art.**

Lecture, three hours; quiz, one hour. Art and architecture of Western Europe from the Migration period until 1000 A.D.  
Mr. Kleinbauer, Mr. Werckmeister

**105C. Romanesque Art.**

(Formerly numbered 112B.) Lecture, three hours; quiz, one hour. Art and architecture of Western Europe in the 11th and 12th centuries.  
Mr. Werckmeister

**105D. Gothic Art.**

Lecture, three hours; quiz, one hour. Art and architecture of Europe in the 13th century.  
Mr. Brummer, Mr. Werckmeister

**106A. Italian Art of the Trecento.**

(Formerly numbered 113A.) Lecture, three hours; quiz, one hour. Art and architecture of the 14th century.  
Mr. Birkmeyer

**106B. Italian Art of the Quattrocento.**

(Formerly numbered 113B.) Lecture, three hours; quiz, one hour. Art and architecture of the 15th century. Mr. Birkmeyer, Mr. Brummer, Mr. Pedretti

**106C. Italian Art of the Cinquecento.**

Lecture, three hours; quiz, one hour. Art and architecture of the 16th century.  
Mr. Pedretti

**108A. Northern Renaissance Art.**

(Formerly numbered 114.) Lecture, three hours; quiz, one hour.  
Mr. Birkmeyer

**108B. Northern Renaissance Art.**

Lecture, three hours; quiz, one hour. Continuation of 108A. Mr. Birkmeyer

**109A. Baroque Art.**

(Formerly numbered 107A.) Lecture, three hours; quiz, one hour. Art and architecture of Italy and Spain, 16th to late 17th century. Mr. Brummer

**109B. Baroque Art.**

(Formerly numbered 107B.) Lecture, three hours; quiz, one hour. Art and architecture of Northern Europe, 16th to late 17th century. Mr. Brummer

**109C. European Art of the 18th Century.**

Lecture, three hours; quiz, one hour. Art and architecture of this period.

**109D. Art and Architecture of Georgian England.**

Lecture, three hours; quiz, one hour. Mr. Wark

**110A. Art of the 19th and 20th Centuries.**

Lecture, three hours; quiz, one hour. Art and architecture from 1789 to the present. Mr. Kaplan

**110B. Art of the 19th and 20th Centuries.**

Lecture, three hours; quiz, one hour. Continuation of 110A. Mr. Kaplan

**110C. Art of the 19th and 20th Centuries.**

Lecture, three hours; quiz, one hour. Continuation of 110B. Mr. Kaplan

**110D. Art of the 19th and 20th Centuries.**

Lecture, three hours; quiz, one hour. Continuation of 110C. Mr. Kaplan

**111. 20th Century Design and Architecture in Italy.**

Lecture, three hours; quiz, one hour. A comprehensive survey of significant developments in design and architecture of Italy during the 20th century; particular emphasis to the period following World War II. Mr. Shapira

**112A. American Art.**

(Formerly numbered 116A.) Lecture, three hours; quiz, one hour. Painting in the United States in the from the Colonial period to the present. Mr. Bloch

**112B. American Art.**

(Formerly numbered 116B.) Lecture, three hours; quiz, one hour. Painting in the United States in the 18th and 19th centuries. Mr. Bloch

**114A. Indian Art.**

(Formerly numbered 111A.) Lecture, three hours; quiz, one hour. Art and architecture of India and Indonesia from prehistoric times to the present. Mr. Davidson

**114B. Chinese Art.**

(Formerly numbered 111B.) Lecture, three hours; quiz, one hour. Art and architecture of China from prehistoric times to the present. Mr. McCallum

**114C. Japanese Art.**

Lecture, three hours; quiz, one hour. Art and architecture of Japan from prehistoric times to the present. Mr. McCallum

**115A. Advanced Indian Art.**

Lecture, three hours; quiz, one hour. Prerequisite: course 114A. Study in Indian sculpture and architecture. Mr. Davidson

**115B. Advanced Chinese Art.**

Lecture, three hours; quiz, one hour. Prerequisite: course 114B. Study in Chinese painting and sculpture. Mr. McCallum

**115C. Advanced Japanese Art.**

Lecture, three hours; quiz, one hour. Prerequisite: course 114C. Study in Japanese painting and sculpture. Mr. McCallum

**116. Buddhist Art in Asia.**

Lecture, three hours; quiz, one hour. Buddhist art of India, China, Japan, Korea, Central and Southeast Asia; an analysis of changing forms as effected by developments in Buddhist religion and geographic expansion. Mr. Davidson

**118A. The Arts of Oceania.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**118B. The Arts of Pre-Columbian America.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**118C. The Arts of Sub-Saharan Africa.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**119A. The Arts of Africa: Western Sudan.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**119B. The Arts of Africa: The Guinea Coast.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**119C. The Arts of Africa: The Congo.**

Lecture, three hours; quiz, one hour. Mr. Rubin

**120A. History of Prints.**

Lecture, three hours; quiz, one hour. Development of style and techniques of expression in the graphic arts. Mr. Bloch

**120B. History of Prints.**

Prerequisite: course 120A. Continuation of 120A. Mr. Bloch

**121A. Critical and Historical Studies in Drawing.**

(Formerly numbered 117D.) Lecture, three hours; quiz, one hour. Development of style and means of expression in drawing from late Middle Ages to the present.

**121B. Critical and Historical Studies in Drawing.**

(Formerly numbered 117D.) Lecture, three hours; quiz, one hour. Continuation of 121A.

**122. History of Style and Ornament.**

Lecture, three hours; quiz, one hour. Development of stylistic ideas and motifs in the Western world and their expression in design media from the Renaissance to 1900. A study in connoisseurship. Mr. Bloch

**123A. Theory and Criticism of Art.**

(Formerly numbered 101.) Lecture, three hours; quiz, one hour. The esthetic attitude; functionalism and morality in art; components of formal eloquence; symbolism, cognition and esthetic truth, historic theories of art; definition of art and art terms. Mr. Longman

**123B. Theory and Criticism of Art.**

(Formerly numbered 101.) Lecture, three hours; quiz, one hour. Locus of value; nature of vision and representation; history of icons of reality; criteria of critical judgment; cultural and historical relativism; psychology of modern art; criticism of contemporary art. Mr. Longman

**124. Bibliography and Research Methods.**

Proseminar: two hours. Instruction in research methods, use of library, bibliography, etc. Required for all majors intending to undertake graduate work in art history.  
The Staff

## Related Courses in Other Departments

**Anthropology 143. Primitive Art.**

**Classics 151A. Classical Archaeology: Greco-Roman Architecture.**

**151B. Classical Archaeology: Greco-Roman Sculpture.**

**151C. Classical Archaeology: Greco-Roman Painting.**

**Oriental Languages 170A-170B-170C. Archaeology in Early and Modern China.**

**Philosophy 160. Philosophy of Art.**

**DRAWING, PAINTING, PRINTS, SCULPTURE AND PHOTOGRAPHY****130. Life Drawing.**

(Formerly numbered 120.) Studio, eight hours; five hours arranged. Prerequisites: courses 10A, 10B, or consent of instructor. Maximum three courses. Studies from the model. Mr. Brice, Mr. Stussy

**132. Drawing.**

(Formerly numbered 125.) Studio, eight hours; five hours arranged. Prerequisite: consent of the instructor. Maximum two courses. Drawing as a terminal medium of artistic expression. Mr. Foulkes

**133. Painting.**

(Formerly numbered 180.) Studio, eight hours; five hours arranged. Prerequisites: courses 10A-10B, 20A-20B, or consent of the instructor. Maximum three courses. Varied media and subjects. Composition, interpretation, expression.  
Mr. Amato, Mr. Foulkes, Mr. Weeks

**135. Life Painting.**

Studio, eight hours; five hours arranged. Prerequisite: course 133. Maximum three courses. Varied media. Composition, interpretation, expression.  
Mr. Diebenkorn, Mr. Elgart

**140. Print Making.**

Studio, eight hours; five hours arranged. Prerequisites: courses 10A-10B, 20A-20B, 132, or consent of the instructor. Maximum three courses. Engraving, etching, drypoint, aquatint, softground, lithography, woodcut, and mixed media. Traditional and experimental studies. Fine printing. Mr. Brown

**145. Sculpture.**

Studio, eight hours; five hours arranged. Prerequisites: courses 10A-10B, 25 or consent of the instructor. Maximum three courses. Modeling or carving. Clay, plaster, wood, stone, metals, and welding. Plaster casting. Mr. Andrews

**147. Photography.**

Studio, eight hours; five hours arranged. Prerequisites: courses 10A-10B, 20A-20B, or consent of the instructor. Maximum three courses. Photography as a medium of artistic expression.  
Mr. Fichter, Mr. Heinecken

**DESIGN****150A. Principles of Design.**

Studio, eight hours, five hours arranged. Prerequisite: course 30A. Abstract Structuring in design.  
The Staff in Design

**150B. Principles of Design.**

Studio, eight hours, five hours arranged. Prerequisite: course 150A. Forms for process; fundamentals of modulation, modification, and variation.  
The Staff in Design

**150C. Principles of Design.**

Studio, eight hours, five hours arranged. Prerequisite: course 150A. Design in terms of materials of construction.  
The Staff in Design

**151A-151D. Comprehensive Design.**

Studio, eight hours, five hours arranged. Prerequisites: courses 150B, 150C or consent of the instructor. Investigation, experimentation, and evaluation of aesthetic content in form and processes. 151A, Materials; 151B, Communication; 151C, Function; 151D, Environment. Each course may be repeated once.  
The Staff in Design

## Special Studies for All Majors

**197. Honors Course.**

Hours to be arranged. Prerequisite: recommendation of staff. Individual studies for majors with 3.0 average. Maximum, two courses.  
The Staff

**198. Special Courses in Art. (½ or 1 course)****199. Special Studies in Art. (½ to 2 courses)**

Hours to be arranged. Prerequisites: senior standing, consent of the instructor and adviser, and 3.0 average in major. Maximum, two courses. Projects may be in history or studio courses.  
The Staff

## Graduate Courses

Prerequisite for all courses: consent of the instructor. All courses may be repeated for credit upon recommendation of adviser. Not open to undergraduate students. See College of Fine Arts, Unit Requirements, page 90.

**201. Historiography of Art.**

Seminar, two hours. A critical study of the various approaches to art history through the centuries.  
The Staff in Art History

**205. Studies in Prints.**

Seminar, two hours. Mr. Bloch

**206. Studies in Drawings.**

Seminar, two hours. Mr. Bloch

**210. Egyptian Art.**

Seminar, two hours. Mr. Badawy

**213. Problems in Islamic Art.**

Seminar, two hours. Mrs. Otto-Dorn

**220. The Arts of Africa, Oceania and Pre-Columbian America.**

(Formerly numbered 250.) Seminar, two hours.  
Mr. Rubin

**223. Classical Art.**

Seminar, two hours. Miss Downey

**225. Medieval Art.**

(Formerly numbered 252.) Seminar, two hours.  
Mr. Kleinbauer, Mr. Werckmeister

**226A-226B. Medieval Art and Architecture.**

Seminar, two hours. Credit and letter grade will be given only on completion of the full seminar sequence.  
Mr. Kleinbauer

**230. Italian Renaissance Art.**

(Formerly numbered 253.) Seminar, two hours.  
Mr. Pedretti

**231. Leonardo and Renaissance Theory of Art.**

Seminar, two hours. Mr. Pedretti

**235. Northern Renaissance Art.**

(Formerly numbered 254.) Seminar, two hours.  
Mr. Birkmeyer

**240. Baroque Art.**

(Formerly numbered 256.) Seminar, two hours.  
Mr. Brummer

**245. European Art from 1700 to 1900**

(Formerly numbered 259.) Seminar, two hours.

**246. Art and Architecture of Georgian England.**

Seminar, two hours. Mr. Wark

**253. Modern Art.**

(Formerly numbered 258.) Seminar, two hours.  
Mr. Kaplan

**255. American Art.**

Seminar, two hours. Mr. Bloch

**260. Asian Art.**

Seminar, two hours. Mr. Davidson, Mr. McCallum

**263. Theory and Criticism of Art.**

Seminar, two hours. Mr. Longman

**271. Graduate Painting. (½ to 2 courses)**

Hours to be arranged. The Staff

**272. Graduate Printmaking. (½ to 2 courses)**

Hours to be arranged. Mr. Brown

**273. Graduate Sculpture. (½ to 2 courses)**

Hours to be arranged. Mr. Andrews

**274. Graduate Photography. (½ to 2 courses)**

Hours to be arranged. Mr. Fichter, Mr. Heinecken

**280. Graduate Graphic Design. (½ to 2 courses)**

Hours to be arranged.  
Mr. Gordon, Mr. Jennings

**281. Graduate Industrial Design. (½ to 2 courses)**

Hours to be arranged. Mr. Best

**282. Graduate Environmental Design.**

(½ to 2 courses)

Hours to be arranged. Mr. Gordon, Mr. Roberts

**283. Graduate Costume Design. (½ to 2 courses)**

Hours to be arranged. Mrs. McCloskey

**284. Graduate Ceramics. (½ to 2 courses)**

Hours to be arranged. Mr. Traynor

**287. Graduate Design and Structure: Fibor.**

(½ to 2 courses)

(Formerly numbered 285B.) Hours to be arranged.  
Mr. Kester, Mrs. Sunkees

**288. Seminar in Design.**

Seminar, three hours. Mrs. Fetty

**289. Seminar in Pictorial Arts.**

Seminar, two hours. The Staff in Pictorial Arts

Professional Courses

**401. History of Museums and Collecting.**

Prerequisites: B.A. in Art History and course 124.  
The Staff

**402. Connoisseurship.**

Prerequisites: B.A. in Art History and course 124.  
The Staff

**403A-403B. Restoration, Preservation and Conservation.**

Prerequisites: B.A. in Art History and course 124.  
Mr. Johnson

Individual Study and Research

**596. Directed Individual Study or Research.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ to 2 courses)**

Prerequisite: consent of the instructor. The Staff

**598. Research for and Preparation of the Master's Thesis. (½ to 2 courses)**

Prerequisite: consent of the instructor. The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (½ to 2 courses)**

Prerequisite: consent of the instructor. The Staff  
Related Courses in Another Department

Classics 251A. Seminar in Classical Archaeology: The Aegean Bronze Age.

251B. Seminar in Classical Archaeology: Greco-Roman Architecture.

251C. Seminar in Classical Archaeology: Greco-Roman Sculpture.

251D. Seminar in Classical Archaeology: Greco-Roman Painting.

The Department of Art reserves the right to hold for exhibition purposes examples of any work done in classes and to retain for the permanent collection of its galleries such examples as may be selected.

**University Art Galleries**

The UCLA Art Galleries in the South Wing of the Dickson Art Center present a series of major exhibitions throughout the year. The main emphasis is on modern art and its origins. Scholarly exhibitions dealing with earlier periods are integrated with the teaching program. An active print room is devoted primarily to the collection of the Grunwald Graphic Arts Foundation.

## ■ ASTRONOMY

(Department Office, 8979 Mathematical Sciences Building)

George O. Abell, Ph.D., *Professor of Astronomy (Chairman of the Department)*.

Lawrence H. Aller, Ph.D., *Professor of Astronomy*.

Samuel Herrick, Ph.D., *Professor of Astronomy and Engineering*.

Daniel M. Popper, Ph.D., *Professor of Astronomy*.

Harland W. Epps, Ph.D., *Assistant Professor of Astronomy*.

Kurt W. Riegel, Ph.D., *Assistant Professor of Astronomy*.

Roger K. Ulrich, Ph.D., *Assistant Professor of Astronomy*.

Edward K. L. Upton, Ph.D., *Assistant Professor of Astronomy*.

\_\_\_\_\_, *Assistant Professor of Astronomy*.

\_\_\_\_\_, *Assistant Professor of Astronomy*.

\_\_\_\_\_, *Assistant Professor of Astronomy*.

\_\_\_\_\_, *Director of Lick Observatory*.

### Advising

Every student enrolled in the curriculum in astronomy is required to have each quarter a program approved by a departmental adviser.

### Preparation for the Major

Required: Physics 7A-7B-7C-7D; Mathematics 11A-11B-11C, 12A-12B-12C. Recommended: Chemistry 1A; a reading knowledge of French, German and/or Russian.

### The Major

Required: Astronomy 101, 103A-103B-103C; 117A-117B-117C; Physics 105A-105B, 131, 110A-110B, 115A-115B. Mathematics: at least one upper division course chosen from 130 through 152. Also recommended: Astronomy 104; Physics 108, 112A, 112B, 124A; Engineering 160A, 160B.

*Astrodynamics.* Students with a major interest in the applications of celestial mechanics to problems of space flight are referred to the Department of Engineering, which offers courses in this field.

### Requirements for the Master's Degree

*General Requirements.* See pages 153-156. The Department offers work under The Comprehensive Examination Plan. This examination consists of tests in three fields specified by the Department. A reading knowledge of French, German, or Russian must be demonstrated. Each student must attempt to pass the language examination during his first year of graduate studies. The requirements for the master's degree should normally be completed at the end of one year, and must be completed not later than two years after beginning graduate studies.

In fulfilling the graduate course requirement, courses in astrodynamics, offered in engineering (courses 260A-260B-260C, 261A), are to be considered courses in astronomy.

Each graduate student admitted from another institution is required to take a placement examination before enrolling in classes his first quarter. The examination will test the student's preparation in subject matter equivalent to that in the following UCLA undergraduate courses: Astronomy 101, 103A-103B-103C, 117A-117B-117C; Physics 105A-105B, 110A-110B, 115A-115B, and 131. Those courses that may be required on the basis of this examination must be completed in the student's first year of graduate enrollment.

### Requirements for the Degree of Doctor of Philosophy

*General Requirements.* See page 156. The Department requires reading knowledge in two of the languages: French, German, and Russian. At least one language examination must be attempted during each year of graduate studies until two of them have been passed. The candidate must obtain a master's degree. (See the preceding section.)

A total of seven field examinations in subjects designated by the Department must be passed. The field examinations should normally be completed after two years and must be completed not later than three years after beginning graduate studies. The candidate will also be required to pass an oral qualifying examination, conducted by his doctoral committee, that will test his preparation to conduct a specialized research problem.



The Department of Astronomy operates an off-campus observatory at Ojai, California, which features a 24-inch reflecting telescope that is available to students in their independent study and research programs in connection with courses 199, 596A and 599.

Lower Division Courses

**Physical Sciences 3A. Astronomy.**

(Formerly numbered Astronomy 1.)

**2. Practice in Observing. (½ course)**

Meets one evening a week for 2½ hours. Prerequisite: knowledge of plane trigonometry and some previous or concurrent course in astronomy, or consent of the instructor. Practical work for beginners, including telescopic observations and laboratory exercises cognate to an introductory course in astronomy. **The Staff**

Upper Division Courses

**101. Introduction to Astronomy.**

Meets four hours per week. Prerequisites: Physics 7A and Mathematics 11A-11B or their equivalents. Open to qualified sophomores as well as upper division students. Course 2 may be elected for observatory and laboratory work in connection with this course. A survey of the whole field of astronomy, designed primarily for students majoring in a physical science or mathematics. **The Staff**

**103A. Spherical and Gravitational Astronomy.**

Meets three hours per week. Prerequisites: Physics 7A-7B-7C-7D; Mathematics 11A-11B-11C and either 12A-12B or 13A-13B or their equivalents. Spherical astronomy; the two body problem; orbit determination of minor planets and binary stars. **Mr. Abell, Mr. Epps**

**103B. The Solar System.**

Meets three hours per week. Prerequisite: course 103A. Gravitational potential of a planet, precession, perturbations, radar astronomy, theory of solar radio observations, planetary temperatures and atmospheres, interplanetary medium, origin of the solar system.

**103C. Stars and Galaxies.**

Meets three hours per week. Prerequisites: the same as for course 103A plus course 101; or 103A-103B. Thus a non-astronomy major may take 101 and 103C. Properties of stars; stellar distribution and motions; structure of the galaxy; galaxies and cosmology. **The Staff**

**104. Astronomical Optics.**

Meets three hours per week. Prerequisite: Physics 105A. Geometrical optics, including ray tracing and optical aberrations commonly encountered in optical design. Interference, diffraction, dispersion, photoelectric emission and other aspects of physical optics with particular emphasis placed on practical applications in astronomical investigation. **Mr. Epps**

**117A-117B-117C. Introduction to Astrophysics.**

Meets three hours per week. Prerequisite: senior standing in astronomy or physics, or consent of the instructor. Course 117A: spectroscopy and the physical foundations of astrophysics. Course 117B: radiative transfer; outer layers of the sun and stars; stellar chemical abundances. Course 117C: stellar interiors and evolution; interstellar matter and star formation. **The Staff**

**199. Special Studies. (½ or 1 course)**

Prerequisite: senior standing in astronomy or physics, with an outstanding record and consent of the instructor. Special studies with an individual faculty member. With prior approval, this course may be used to carry out a meritorious observing program at the UCLA Students' Observatory, or in special cases with the 24-inch reflector at the Department's Field Station in Ojai. **The Staff**

Graduate Courses

Prerequisite to graduate courses is by consent of the instructor. Graduate courses 201 through 229 are offered in alternate years.

**\*201A-201B-201C. Astrophysics of the Solar System.**

The sun, solar phenomena, and solar-terrestrial relationships. The interplanetary medium and astronomical plasma physics, comets, meteorites, meteors, satellites and planets, planetary atmospheres. Origin and evolution of the solar system. **Mr. Aller**

**\*204A-204B-204C. Observational Astronomy.**

Positional astronomy, data reduction, telescopes, photometric, spectroscopic and radio instruments and techniques. Includes laboratory. **Mr. Epps, Mr. Popper, Mr. Riegel**

**208. The Interstellar Medium.**

Interstellar gas and dust. Diffuse and planetary nebulae. Magnetic fields in space and the acceleration of cosmic rays. Star formation. **Mr. Aller**

**217A-217B. Stellar Photospheres.**

Meets three hours per week. Physics of stellar photospheres and radiative transfer. The continuous and line spectra of stars. Chemical abundances in stars. **Mr. Aller, Mr. Ulrich**

**219A-219B. Galactic Astronomy.**

Statistical astronomy. Distance determinations. Stellar motions and populations. Radio observations of the interstellar medium. Stellar dynamics. Structure of the galaxy from optical and radio observations. **Mr. Riegel, Mr. Upton**

**\*227A-227B. Stellar Structure and Evolution.**

Structure and evolution of the stars. Stellar energy sources and origin of the elements. Pulsation theory of variable stars. The second quarter is devoted partly to the application of machine computation to the solution of astrophysical problems, including the computation of stellar models. **Mr. Epps, Mr. Ulrich, Mr. Upton**

**229. Extragalactic Astronomy.**

Galaxies and clusters of galaxies. Distribution of matter in space. The observational approach to cosmology. **Mr. Abell**

**240. Modern Problems in Astronomy and Astrophysics.**

Special topics offered by distinguished visiting professors. May be repeated for credit. Open to qualified graduate students in astronomy and in related fields (physics, meteorology, planetary and space physics).

\* Not to be given, 1970-1971.

**250. Seminar on Current Astronomical Research.**

(½ course)

The Staff

**285. Seminar on the Origin of the Solar System.**

(Same as Planetary and Space Science 285.)  
 Dynamical problems of the solar system; chemical evidences from geochemistry, meteorites, and the solar atmosphere; nucleosynthesis; formation of the solar nebula; solar contraction; hydromagnetic processes in the nebulae, condensation of the planets; origin of satellite systems.

The Staff

**Individual Study and Research**

The following courses, 596A, 596L and 599, may be repeated by a student at the discretion of the Department.

**596A. Directed Individual Studies. (½ to 2 courses)**

The Staff

**596L. Advanced Study and Research at the****Lick Observatory. (½ to 3 courses)**

Intended for graduate students who require observational experience as well as for those working upon observational problems for their theses.

The Staff

**599. Doctoral Research and Writing.**

(2 to 3 courses)

The Staff

**Related Courses in Other Departments**

The following courses are of interest jointly to qualified students in astronomy. Credit toward the M.A. in astronomy may be allowed for one or two of these courses.

**Engineering 160A. Astrodynamics and Rocket Navigation.**

160B. The Determination of Orbits.

260A-260B. Celestial Mechanics.

260C. Nongravitational Astrodynamics.

261A. Advanced Orbit Theory.

**Meteorology 228A-228B. Theory of Radiation Transfer in Planetary Atmospheres.****Planetary and Space Science 101. Introduction to Planetary and Space Physics.**

220A-220B-220C. Planetary and Orbital Dynamics 1, 2, 3.

225A-225B. Physics and Chemistry of Planetary Interiors 1, 2.

228A-228B. Magnetic Fields of the Earth and Planets 1, 2.

260A-260B-260C. Particles and Fields in Space.

**■ BACTERIOLOGY**

(Department Office, 5304 Life Sciences Building)

June Lascelles, Ph.D., *Professor of Bacteriology.*†Rafael J. Martinez, Ph.D., *Professor of Bacteriology.*\*M. J. Pickett, Ph.D., *Professor of Bacteriology.*Sydney C. Rittenberg, Ph.D., *Professor of Bacteriology (Chairman of the Department).*William R. Romig, Ph.D., *Professor of Bacteriology.*Meridian Ruth Ball, Sc.D., *Emeritus Professor of Bacteriology.*Anthony J. Salle, Ph.D., *Emeritus Professor of Bacteriology.*Frederick A. Eiserling, Ph.D., *Associate Professor of Bacteriology.*Gregory J. Jann, Ph.D., *Associate Professor of Bacteriology.*†David R. Krieg, Ph.D., *Associate Professor of Bacteriology.*†Eli E. Sercarz, Ph.D., *Associate Professor of Bacteriology.*R. John Collier, Ph.D., *Assistant Professor of Bacteriology.*Donald P. Nierlich, Ph.D., *Assistant Professor of Bacteriology.*

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Luciano Barajas, M.D., *Associate Professor of Zoology.*Wilbur T. Ebersold, Ph.D., *Associate Professor of Botany.*E. Virginia Merriam, Ph.D., *Acting Assistant Professor of Molecular Biology in Bacteriology.*John R. Merriam, Ph.D., *Assistant Professor of Zoology.*James N. Miller, Ph.D., *Associate Professor of Medical Microbiology and Immunology.*Dan S. Ray, Ph.D., *Assistant Professor of Molecular Biology in Zoology.*Winston A. Salzer, Ph.D., *Assistant Professor of Molecular Biology in Zoology.*Fritiof S. Sjöstrand, M.D., Ph.D., *Professor of Zoology.***Preparation for the Major**

Biology 1A-1B; Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Mathematics 3A-3B-3C;

Physics 6A-6B-6C. For transfer students lacking the equivalent of Chemistry 1B laboratory, Chemistry 5, half course, will be required.

\* Absent on leave, fall and winter quarters, 1970-1971.

† On sabbatical leave, 1970-1971.

**The Major**

Bacteriology 100A-100B-100C, 107, plus two additional upper division courses in bacteriology; Chemistry 153. Three additional upper division courses chosen from the bacteriology list or from botany, chemistry, mathematics, or zoology with approval of the Department. For those planning graduate work in microbiology, Chemistry 154 recommended. Bacteriology 195 or 199 will not be counted toward the major without departmental approval.

**Graduate Study**

The Department of Bacteriology offers programs of study and research leading to the M.A. and Ph.D. degrees in microbiology (see pages 152-157). Financial aid is available to qualified graduate students in the form of teaching assistantships, traineeships and research assistantships. More detailed information may be obtained by writing to the Chairman, Department of Bacteriology.

**Advisement**

Each undergraduate and graduate student will be assigned an official departmental adviser upon entrance. It is the student's responsibility to confer with his adviser at least once every quarter.

**Lower Division Courses (See also Biology)****6. Introduction to Microbiology.**

Lecture, three hours; laboratory-demonstration, one hour. For the nontechnical student; an introduction to the biology of microorganisms (bacteria, viruses, protozoa, algae, fungi), their significance as model systems for understanding fundamental cellular processes, and their role in human affairs.

Mr. Jann, Mr. Pickett, Mr. Sercarz

**Upper Division Courses****100A. Fundamentals of Bacteriology.**

Lecture, three hours; laboratory, discussion, six hours. Prerequisite: Biology 1A-1B; Chemistry 4A-4B-4C, 6A-6B-6C. The historical foundations of the science; the structure, physiology, ecology and applications of bacteria.

Mr. Jann, Mr. Rittenberg

**100B. Fundamentals of Bacteriology.**

Lecture, three hours; laboratory, four hours. Prerequisite: course 100A. Host-parasite relations; the agents of infection, host response, and diagnosis and control of infection.

Mr. Collier

**100C. Fundamentals of Bacteriology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 100A. Bacterial taxonomy; the biology of the major groups of bacteria, and the application of elective culture procedures.

Mr. Rittenberg

**107. Comparative Genetics.**

(Formerly numbered 136. Same as Botany 107 and Zoology 107.) Lecture, three hours. Prerequisites: Biology 1A-1B. Mendelian principles. The gene: its structure, function, and chemistry, with emphasis on mutation, coding, regulation and transmission. Mr. Ebersold, Mr. Merriam, Mr. Romig

**110. The Microbiology of Infection.**

(Formerly numbered 103.) Lecture, two hours, laboratory, six hours. Prerequisite: courses 100A-100B. The salient characteristics of bacteria, rickettsiae, and viruses, both pathogenic and adventitious, associated with diseases of man. Mr. Pickett

**110C. The Laboratory Diagnosis of Infection.**

(½ course)

Laboratory, six hours. Prerequisite: course 110. Techniques in the laboratory examination of clinical material.

**111. Immunology.**

(Formerly numbered 130.) Lecture, three hours; laboratory, four hours. Prerequisites: course 100B; concurrent registration in Chemistry 153. Structure of antigens and antibodies; nature of immunological specificity; cellular aspects of the immune response; regulatory mechanisms in immunology; hypersensitivity. Mr. Sercarz

**112A-112B. Structure and Physiology of Bacteria.**

(Formerly numbered 106.) Lecture, three hours. Prerequisite: course 100A, Chemistry 153; or consent of instructor. A review of current knowledge of bacterial growth and reproduction, considered at the molecular level. Discussions of cellular structure, growth kinetics, the synthesis of DNA, RNA, and protein, the regulation of metabolism, and general cellular physiology.

Mr. Eiserling, Mr. Martinez, Mr. Nierlich

**112C. Laboratory in Structure and Physiology.**

(½ course)

(Formerly numbered 106C.) Laboratory, six hours. Prerequisite or corequisite: course 112B. The experimental basis of modern microbial physiology.

Mr. Eiserling, Mr. Martinez, Mr. Nierlich

**113. Bacterial Metabolism.**

Lecture, three hours; laboratory, four hours. Prerequisite: course 100A, Chemistry 153; or consent of instructor. The major patterns of energy generation and biosynthesis, and their regulation.

Miss Lascelles

**119. Phage and Bacterial Genetics.**

Lecture, three hours. Prerequisite: courses 100B, 107, or consent of instructor. Genetics of bacteria and bacteriophage with emphasis on mechanisms of transmission and recombination, episomes and viral reproduction.

Mr. Krieg, Mr. Romig

**195. Proseminar. (½ course)**

Discussion, one hour. Prerequisite: senior standing and consent of instructor. Small groups of students and instructor discuss current research literature. Topic announced each quarter. Enrollment limited.

The Staff

**199. Special Studies in Bacteriology.**

(½ to 1 course)

Prerequisites: senior standing and consent of the department prior to registration. Maximum enrollment for three quarters.

The Staff

## Microbiology

### Graduate Courses

#### 200A-200B. Research Methods of Microbiology.

(Formerly numbered 201.) A course for beginning graduate students normally taken the first two quarters in residence. Experimental introduction to modern research techniques and instrumentation.

The Staff

#### 202. Gene Structure and Function.

(Same as Botany 202 and Zoology 202.) Lecture and discussion, three hours. Prerequisites: course 107 and Chemistry 153 or consent of the instructor. The genetic coding of information and its transfer from DNA through RNA to protein; the operon model and other aspects of regulatory genetics, mutations and genetic fine structure.

Mr. Krieg, Mr. Romig

#### 203. Chromosome Structure and Replication.

(Same as Botany 203 and Zoology 203.) Prerequisites: course 107, Chemistry 153, Physics 7A-7B-7C or consent of the instructor. A survey of biochemical and biophysical investigations of the structure and replication of chromosomal nucleic acids with emphasis on bacterial and viral systems.

Mr. Ray

#### 204. Microbial Genetics.

(Formerly numbered 212.) Lecture, one hour; laboratory, nine hours. Prerequisite: consent of the instructor. Advanced methodology for the study of bacterial and viral genetics.

Mr. Romig

#### 206. Subcellular Structure and Function in Bacteria.

Lecture and discussion, three hours. Prerequisites: course 112A-112B, or consent of the instructor. A discussion of the structure, chemical nature, biosynthesis, and function of subcellular elements of bacteria.

Mr. Eiserling, Mr. Martinez

#### 207. Electron Microscopy in Microbiology.

Lecture, two hours; laboratory, ten hours. Prerequisites: courses 112A-112B or 206, an acceptable course in physical chemistry, or consent of instructor. Corequisite: concurrent enrollment in related studies in course 599. Principles of electron microscopy as applied to microbiology; quantitative methods and high resolution studies of bacteria, viruses, and subcellular particles.

Mr. Eiserling

#### 206. Regulatory Mechanisms in Microbial Physiology.

Lecture and discussion, three hours. Discussions based on the current literature on control mechanisms regulating fundamental cellular processes. Topics include the regulation of enzyme and gene activities at the molecular and cellular levels.

Mr. Nierlich

#### 209. Molecular Biology Laboratory.

(Same as Zoology 209.) Lecture, two hours; laboratory, eight hours. Prerequisite: consent of instructor. Selected experimental approaches in molecular biology. The current emphasis is on techniques for the study of protein synthesis in cell free systems, determination of the genetic code, and the study of repressor molecules.

Mr. Salzer

#### 210. Advanced Microbial Biochemistry.

Lecture and discussion, three hours. Prerequisite: course 113 or consent of the instructor. A considera-

tion of specialized aspects of microbial chemistry and metabolism with emphasis on current developments.

Miss Lascelles, Mr. Nierlich

#### 222A-222I. Advanced Topics in Microbiology.

(½ course each)

Lecture and discussion, two hours. The subject matter of this course will be in an advanced field of microbiology in which the instructor has special proficiency. The fields for each quarter will be announced in the Schedule of Classes.

The Staff

#### 241A-241B-241C. Electron Microscopy.

(Same as Zoology 241A-241B-241C.) Lecture, two hours, discussion and laboratory, ten hours. Prerequisite: consent of instructor, based on a written research proposal. Co-requisite: concurrent enrollment in related studies in course 599. Principles of electron microscopy applied to research problems in molecular biology and microbiology. Training in quantitative methods, autoradiography, nucleic acid visualization, freeze-etching. Course 241B emphasizes thin sectioning and related methods. Course 241C includes methods and principles of high resolution electron microscopy.

Mr. Barajas, Mr. Eiserling, Mr. Sjöstrand

#### 250. Seminar in Microbial Metabolism. (½ course)

Miss Lascelles, Mr. Rittenberg

#### 251. Seminar in Regulation and Differentiation.

(½ course)

Mr. Nierlich

#### 252. Seminar in Medical Microbiology. (½ course)

Mr. Pickett

#### 253. Seminar in Immunology. (½ course)

Mr. Sercarz

#### 254. Seminar in Microbial Physiology. (½ course)

Mr. Collier, Mr. Jann, Mr. Martinez

#### 255. Seminar in Bacterial Viruses. (½ course)

Mr. Krieg

#### 256. Seminar in Microbial Genetics. (½ course)

Mr. Eiserling, Mr. Romig

#### \*257. Seminar in Host-Parasite Relationships.

(½ course)

(Same as Medical Microbiology and Immunology 257.)

Mr. Miller, Mr. Pickett

#### Individual Study and Research

#### 596. Directed Individual Research.

(½ to 2 courses)

The Staff

#### 598. Research for Master's Thesis.

(½ to 2 courses)

The Staff

#### 599. Research for Doctoral Dissertation.

(½ to 2 courses)

The Staff

\* Not to be given, 1970-1971.

## ■ BIOCHEMISTRY

### Graduate Study

Programs of study and research leading to the M.S. and Ph.D. degrees in the general area of biochemistry are offered in the Department of Biological Chemistry, School of Medicine (see page 194), in the Division of Biochemistry, Department of Chemistry

(see page 220), and in the Department of Botanical Sciences (see page 200). More detailed information regarding admission requirements and opportunities for graduate studies in these programs may be obtained by writing to the graduate adviser in the department in which you are interested.

## ■ BIOLOGICAL CHEMISTRY

(Department Office, 33-257 Center for the Health Sciences)

Robert M. Fink, Ph.D., *Professor of Biological Chemistry.*

Isaac Haray, Ph.D., *Professor of Biological Chemistry.*

David R. Howton, Ph.D., *Professor of Biophysics in Residence and Professor of Biological Chemistry in Residence.*

Ralph W. McKee, Ph.D., *Professor of Biological Chemistry.*

James F. Mead, Ph.D., *Professor of Biophysics and Professor of Biological Chemistry.*

Joseph F. Nyc, Ph.D., *Professor of Biological Chemistry.*

John G. Pierce, Ph.D., *Professor of Biological Chemistry (Vice-Chairman of the Department).*

George J. Popják, M.D., D.Sc., *Professor of Psychiatry and Biological Chemistry.*

†Sidney Roberts, Ph.D., *Professor of Biological Chemistry.*

Emil L. Smith, Ph.D., *Professor of Biological Chemistry (Chairman of the Department).*

Marian E. Swendseid, Ph.D., *Professor of Nutrition and Professor of Biological Chemistry.*

Irving Zabin, Ph.D., *Professor of Biological Chemistry.*

Stephen Zamenhof, Ph.D., *Professor of Biological Chemistry and Professor of Microbial Genetics, Medical Microbiology and Immunology.*

Max Dunn, Ph.D., LL.D., *Emeritus Professor of Chemistry and Biological Chemistry.*

Samuel Eiduson, Ph.D., *Associate Professor of Biological Chemistry in Residence and Associate Professor of Psychiatry in Residence.*

†Alexander N. Glazer, Ph.D., *Associate Professor of Biological Chemistry.*

John E. Snoke, Ph.D., *Associate Professor of Biological Chemistry.*

June E. Ayling, *Assistant Professor of Biological Chemistry.*

Robert J. DeLange, Ph.D., *Assistant Professor of Biological Chemistry.*

John Edmond, Ph.D., *Assistant Professor of Biological Chemistry.*

Armand J. Fulco, Ph.D., *Assistant Professor of Biophysics in Residence and Assistant Professor of Biological Chemistry in Residence.*

Dohn G. Glitz, Ph.D., *Assistant Professor of Biological Chemistry.*

Harvey R. Herschman, Ph.D., *Assistant Professor of Biological Chemistry.*

Bruce D. Howard, M.D., *Assistant Professor of Biological Chemistry.*

Francis S. Markland, Ph.D., *Assistant Professor of Biological Chemistry in Residence.*

David S. Sigman, Ph.D., *Assistant Professor of Biological Chemistry.*

Patrice J. Zamenhof, Ph.D., *Assistant Professor of Biological Chemistry in Residence.*

### Requirements for Admission to Graduate Status

1. For general University requirements for the M.S. degree, see pages 153-154; for the Ph.D. page 156 of this catalog.

2. Minimum departmental requirements: applicants must have received the bachelor's

degree, preferably with an undergraduate major in chemistry. Students who have degrees in a biological science are also eligible. A previous course in biochemistry is not a prerequisite for acceptance as a graduate

† On sabbatical leave, 1970-1971.

student. Minimum course requirements for admission normally include the following: general chemistry; quantitative chemistry; organic chemistry (including laboratory); physical chemistry (including laboratory); general physics; and mathematics through calculus. In some cases the requirement in physical chemistry or mathematics may be fulfilled during the first year of graduate study. Courses in life sciences such as biology (similar to General Biology 1A-1B) or zoology or bacteriology and advanced quantitative analysis, qualitative organic analysis and advanced organic chemistry are recommended.

#### Concurrent M.D. and Ph.D. Programs

Students may enroll in both the School of Medicine and the Graduate Division in order to fulfill some graduate degree requirements while obtaining the M.D. degree. This dual registration makes it possible for a medical student to utilize for graduate work one vacation period and the four elective quarters during the four-year medical curriculum and to offer this work in partial fulfillment of the requirements for the Ph.D. The Department of Biological Chemistry offers this opportunity to qualified applicants. There are various ways in which financial support can be made available to students in the program after completion of one or two years of the medical curriculum. Contact Dr. Joseph Nyc, the Department Adviser, for further information concerning the program.

#### Requirements for the M.S. degree

1. General University Requirements, see pages 153-154.

2. Thesis Plan. Courses 253, 255, 257, 263 and 267 following completion of a beginning course in biochemistry either before or after admission to graduate status. A reading knowledge of German, Russian or French. Completion of a satisfactory thesis based on laboratory research. Oral examination on thesis and a written qualifying examination if performance in courses 253, 255, 257, 263 and 267 is not B or better. By arrangement in special cases a comprehensive examination may be substituted.

#### Requirements for the Ph.D. degree

1. General University Requirements, see page 156.

2. Courses 253, 255, 257, 263 and 267 following completion of a beginning course in biochemistry either before or after admission to graduate status plus courses 220, 260 and

599 and other courses recommended on an individual basis. A reading knowledge of German, Russian or French plus a second language (programs of special subjects such as computer techniques may be substituted for the second language).

The Department of Biological Chemistry in the Medical School and the Division of Biochemistry of the Chemistry Department offer coordinated programs leading to the M.S. and Ph.D. degrees. Although there is close cooperation between the two departments, a student must be formally admitted into the program of one department or the other. For more information concerning graduate study in biological chemistry, write to Joseph F. Nyc, Graduate Adviser, Center for Health Sciences, University of California, Los Angeles, California 90024.

#### Upper Division Courses

##### 101A-101B-101C. Biological Chemistry.

Lecture, three hours. Prerequisite: organic chemistry. Required in the medical curriculum; consent of the instructor is required for nonmedical students. The Staff

##### 101D. Biological Chemistry Seminar for Medical Students. (½ course)

Lecture or recitation, four hours. Required in the medical curriculum. Special subjects, such as metabolic defects, biochemistry of antibodies, neurobiochemistry, etc., are studied in depth by small groups meeting to present and discuss topics on the selected subject. Mr. Fink and the Staff

##### 101E. Biological Chemistry Laboratory.

Laboratory, seven hours. Required in the medical curriculum; consent of the instructor is required for nonmedical students. Experiments illustrating some of the procedures employed in clinical chemistry, enzymology and metabolic studies. The Staff

##### 102A-102B. Biological Chemistry (Dental Students).

Lecture, three hours. Prerequisite: courses for admission to dental school. Required in the dental curriculum; consent of the instructor is required for nondental students. the Staff

##### 102C. Biological Chemistry Laboratory (Dental Students). (½ course)

Laboratory, four hours. Required in the dental curriculum; consent of the instructor is required for nondental students.

Mr. McKee, Mr. Snoko, and the Staff

#### Graduate Courses

##### 220A-220D. Biochemical Preparations.

(½ to 2 courses each)

Lecture or recitation, one hour; laboratory, by arrangement. Prerequisite: consent of the instructor. Laboratory techniques important in biochemical research; isolation, identification and determination of biologically active compounds. Mr. Nye

**221. Neurobiochemistry.**

Lecture or recitation, three hours. Prerequisites: course 101A-101B-101C or equivalent. Chemistry and metabolism of the nervous system with particular emphasis on development, differentiation and function. Mr. Eiduson, Mr. Roberts

**253. Proteins and Nucleic Acids.**

(Same as Chemistry 253.) Lecture or recitation, four hours. Prerequisites: Chemistry 153 or course 101B and Chemistry 110A-110B or equivalent. Chemical and physical properties of proteins, amino acids, nucleotides and nucleic acids; structure and sequence determination; correlation of structure and biological properties; synthesis and properties of polypeptides and polynucleotides. The Staff

**255. Biological Catalysis.**

(Same as Chemistry 255.) Lecture or recitation, four hours. Prerequisites: Chemistry 143A, Chemistry 153 or course 101B and Chemistry 110A-110B or equivalent. Discussion of approaches to the understanding of enzymes and enzymic catalysis; characteristics of different enzymes and enzymic reactions of special biological processes. The Staff

**257. Physical Chemistry of Biological Macromolecules. (½ course)**

(Same as Chemistry 257.) Lecture, two hours. Prerequisite: Chemistry 110A or consent of the instructor. Theory of hydrodynamic, thermodynamic, optical and x-ray techniques used to study the structure and function of biological macromolecules. The Staff

**260A-260B-260C. Seminar in Biological Chemistry. (½ course each)**

Lecture or recitation, one hour. Prerequisite: consent of the instructor. Oral reports by graduate students on topics selected from current biochemical literature. Mr. Fulco

**261A-261B-261C. Seminar in the Biochemistry of Lipids. (½ course each)**

Lecture or recitation, one hour. Prerequisites: courses 101A-101B-101C or equivalent; consent of the instructor. Biochemistry of lipids including methods of isolation, characterization and determination; role of lipids in animal metabolism. Mr. Howton, Mr. Mead

**262A-262D. Seminar in the Biochemistry of Proteins. (½ course each)**

Lecture or recitation, one hour. Prerequisites: courses 101A-101B-101C and consent of the instructor. An advanced seminar in the field of protein structure including current methods used in research and the relationships between the structure and function of proteins. Mr. DeLange, Mr. Glazer, Mr. Markland

**BIOLOGY**

(See also Bacteriology, Botanical Sciences, and Zoology)

**Lower Division Courses**
**1A-1B. Introductory Biology.**

Lecture, three hours; laboratory, three hours. Prerequisite: Chemistry 1A. Offered primarily for majors in bacteriology, botany, zoology, and other

**263. Cellular Metabolism.**

(Same as Chemistry 263.) Lecture or recitation, three hours. Prerequisites: Chemistry 153 or course 101B and Chemistry 110A or equivalent. Patterns of biological degradation and synthesis; metabolic interrelationships and control; energetics of metabolism. The Staff

**264. Seminar in Regulation of Cell Metabolism. (½ course)**

Lecture or recitation, one hour. Prerequisites: courses 101A-101B-101C or equivalent. Regulatory processes in animal metabolism. Membrane transport, intracellular compartmentation, protein biosynthesis, enzyme activation and inhibition; relationship to hormone action and cell function. Mr. Roberts

**266A-266B-266C. Seminar in the Biochemistry of Differentiation. (½ course each)**

Lecture or recitation, one hour. Prerequisite: consent of the instructor. A review of the current literature covering the chemical mechanisms underlying the developmental process including: control of gene expression, metabolism in developing systems, specific expression of function and control of enzyme synthesis, external parameters determining cellular expression in the whole organism and the single cell. Mr. Harary

**267. Nucleic Acid and Protein Biosynthesis. (½ course)**

(Same as Chemistry 267.) Lecture or recitation, two hours. Prerequisites: Chemistry 153 or course 101C. Mechanisms of nucleic acid and protein biosynthesis and their interrelationships with molecular genetics and control. The Staff

**Individual Study and Research**
**596. Directed Individual Study and Research. (½ to 3 courses)**

Laboratory, by arrangement. Prerequisite: consent of graduate adviser. The Staff

**597. Preparation for Examinations. (½ to 1 course)**

Individual study for qualifying examination for Ph.D. or comprehensive examination for the master's degree. Prerequisite: consent of graduate adviser. The Staff

**598. Preparation of the Master's Thesis.**

Preparation of research data and writing of master's thesis. Prerequisite: consent of the graduate adviser. The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (½ to 3 courses)**

Preparation of research data and writing Ph.D. dissertation. Prerequisite: consent of graduate adviser. The Staff

sciences, as well as premedical and predoctoral students. The general principles of biology. The Staff

**2. Principles of Biology.**

Lecture, three hours; discussion, one hour. Prerequisites: Physical Sciences 1 and 2. Offered for students other than majors in the biological sciences. The general principles of biology. Not open to students who have had Biology 1A-1B. The Staff

**21. Field Biology.**

Lecture, three hours; required field trips. Prerequisite: Biology 2. An introduction to the natural history and ecology, interrelationships, and classification of the common animals and plants, with emphasis on western North America. The Staff

**181A-181B. Biology for Majors in Physical Sciences and Engineering.**

Lecture, three hours; demonstration or discussion, one hour. Prerequisite: upper division standing with a major in physical sciences or engineering. This course may be taken in place of Biology 2 in fulfill-

ment of two quarters of the life sciences requirements for nonmajors in the biological sciences. Principles of biology for students with an advanced background in physical sciences. Not open to students who have had Biology 1A-1B. Mr. Kavanau

**Professional Courses****370. Methods and Materials for Teaching Life Sciences.**

Lectures, demonstrations, field trips. Prerequisite: major in biological sciences, senior or graduate standing, and one of the following courses: Biology 21 or Zoology 104. The Staff

**■ BIOMATHEMATICS**

(Department Office, AV-111 Center for the Health Sciences)

Wilfrid J. Dixon, Ph.D., *Professor of Biomathematics and Biostatistics (Chairman of the Department).*

Donald J. Jenden, B.Sc., M.B., B.S., *Professor of Pharmacology and Biomathematics.*

Frank J. Massey, Ph.D., *Professor of Biostatistics and Biomathematics.*

William S. Yamamoto, M.D., *Professor of Biomathematics and Physiology.*

Virginia A. Clark, Ph.D., *Associate Professor of Biostatistics and Biomathematics.*

Olive Jean Dunn, Ph.D., *Associate Professor of Biostatistics and Biomathematics.*

Robert I. Jennrich, Ph.D., *Associate Professor of Biomathematics and Mathematics.*

Carol M. Newton, M.D., Ph.D., *Associate Professor of Biomathematics.*

Abdelmonem A. Afifi, Ph.D., *Assistant Professor of Biostatistics and Biomathematics.*

Michael A. Fox, Ph.D., *Adjunct Assistant Professor of Biomathematics.*



Edwin H. Chen, Ph.D., *Assistant Research Statistician.*

Alan B. Forsythe, Ph.D., *Lecturer in Biomathematics and Dentistry.*

M. Ray Mickey, Ph.D., *Research Statistician and Lecturer in Biomathematics.*

Roger H. Moore, Ph.D., *Visiting Research Biostatistician and Lecturer in Biomathematics.*

The Department of Biomathematics offers instruction primarily to students with undergraduate preparation in mathematics and the biological and physical sciences. The field of biomathematics relates to the biological domain, which comprises many and diverse sciences, such as mathematical physics relates to the physical. Most courses offered in biomathematics presuppose familiarity with some aspects of biology, as well as with mathematical and computational tools.

After completing formal requirements in biomathematics, biology, mathematics, and statistics those pursuing the Department of Biomathematics proposed degree program may seek different emphases in advanced training for their investigative careers. Some may specialize as theoreticians in a particular area of biology; others may concentrate on mathematical and computational preparation in sufficient depth to enable them to fashion

new analytical tools required by the emerging theoretical components of the biological sciences. In all work, especial emphasis will be placed on exposing students to the difficult decisions biomathematicians must make when considering such problems as adjustment of theoretical approaches to the competing demands of mathematical tractability and biological realism.

Further information concerning course offerings or the proposed graduate degree program may be obtained by writing the Department of Biomathematics.

**Upper Division Courses****110. Elements of Biomathematics.**

Prerequisite: calculus. Analysis of deterministic models including some general approaches to the study of homeostasis. Conditions under which deterministic and probabilistic descriptions of biological phenomena are appropriate. Both approaches will be applied to selected examples in epidemiology and enzyme kinetics. Miss Newton and the Staff



**199. Special Studies in Biomathematics.**

(½ to 1 course)

Prerequisites: upper division standing and consent of the instructor. Special studies in biomathematics, including either reading assignments or laboratory work or both, designed for appropriate training of each student who registers in this course. The Staff

**Graduate Courses****201. Deterministic Models in Biology.**

Prerequisites: linear algebra and differential equations. The conditions under which deterministic approaches can be employed are examined, and conditions where they may be expected to fail. Topics receiving special attention include compartmental analysis, enzyme kinetics, membrane theory, and the homeostatic control of physiological systems. Miss Newton and the Staff

**202A-202B. Time Series Analysis.**

Prerequisites: calculus, linear algebra and probability. Spectral representation, linear time invariant systems, ergodic theory, and prediction theory. Estimation of spectra, coherence, frequency response and bi-spectra. Statistical stability, hypothesis testing, and design. Use of the fast Fourier transform, complex demodulation, and instrumental variables. Biomedical and physical applications. Mr. Jenrich and the Staff

**203. Stochastic Models in Biology.**

Prerequisites: courses 201 and 202. The mathematical description of physiological relationships with particular attention directed to biological areas where the conditions for deterministic models are inadequate. The appropriateness of various stochastic approaches for these analyses will be evaluated. Mr. Dixon and the Staff

**■ BOTANICAL SCIENCES**

(Department Office, 320 Botany Building)

Jacob B. Biale, Ph.D., *Professor of Plant Physiology.*Jack Dainty, Ph.D., *Professor of Botany.*Karl C. Hamner, Ph.D., *Professor of Botany.*George G. Laties, Ph.D., *Professor of Plant Physiology.*F. Harlan Lewis, Ph.D., *Professor of Botany.*O. Raynal Lunt, Ph.D., *Professor of Plant Nutrition and Biophysics.*Mildred E. Mathias (Mildred Mathias Hassler), Ph.D., *Professor of Botany and Director of the Botanical Gardens-Herbarium.*Bernard O. Phinney, Ph.D., *Professor of Botany.*Charles A. Schroeder, Ph.D., *Professor of Botany.*Henry J. Thompson, Ph.D., *Professor of Botany.*Samuel G. Wildman, Ph.D., *Professor of Botany.*David Appleman, Ph.D., *Emeritus Professor of Plant Physiology.*Arthur W. Haupt, Ph.D., *Emeritus Professor of Botany.*Orda A. Plunkett, Ph.D., *Emeritus Professor of Botany.*Flora Murray Scott, Ph.D., *Emeritus Professor of Botany.*Wilbur T. Ebersold, Ph.D., *Associate Professor of Botany (Chairman of the Department).*Park S. Nobel, Ph.D., *Assistant Professor of Molecular Biology.*Vernon T. Stoutemyer, Ph.D., *Professor of Ornamental Horticulture.***210. Introduction to Biomedical Computation.**

Prerequisite: graduate standing. Basic concepts of data acquisition and machine computation, with special reference to biomedical applications. The Staff

**213. Biomedical Laboratory Computing. (½ course)**

Computational problems encountered in the direct processing of physiological data and in controlling laboratory experiments are analyzed. Experience will be acquired in implementing approaches to these problems on a small laboratory computer widely used in the biological sciences. The Staff

**215. Advanced Biomedical Computation.**

Prerequisite: course 210 or equivalent programming experience. Biomedical computation enabling those having elementary FORTRAN programming to acquire skills applicable to biomedical research. Use of random-number generators, stochastic modeling, models with differential equations, package programs, specialized applications, interactive modeling on IBM-2250 graphics system. Individual term projects. Miss Newton and the Staff

**220. Topics in Biological Control Theory.**

Prerequisite: Calculus, up to differential equations. Biochemical, physiological and neurological phenomena are treated theoretically using the methodology of cybernetics. An approach towards understanding the nervous system is presented with a discussion of neurons, neural nets, perception, and various topics in cybernetics. Mr. Fox

**Individual Study and Research****506. Directed Individual Study or Research in Biomathematics. (1 to 2 courses)**

Independent study of an advanced nature. The Staff

**Preparation for the Major**

Biology 1A-1B, Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C, Physics 6A, 6B, 6C, Mathematics 3A-3B-3C.

**The Major**

Botany 103A-103B, 105, 107, 109, 111, 113, plus at least four additional courses selected either from botany or from an approved list of courses in related departments.

**Graduate Study**

Applicants for admission to the graduate program will be expected to submit evidence of adequate undergraduate preparation in the biological and physical sciences. The Department grants advanced degrees with specialization in areas of anatomy, morphology, ecology, systematics, genetics, evolution, plant physiology, plant biochemistry, and soils.

**Requirements for the Master's Degree**

General requirements are given on pages 153-154. Either a thesis or comprehensive examination plan is required. There is no foreign language requirement.

**Requirements for the Doctor's Degree**

Students who plan to do graduate work are expected to have background preparation as listed in the section "Preparation for the Major." They must also complete either the equivalent of the undergraduate major in botany or at least nine quarter courses in the biological sciences, including three upper division courses in a plant science, and the following courses or their equivalents: organic chemistry (Chemistry 133A-133B) and physical chemistry (Chemistry 110A-110B and 113).

In addition to the general requirements of the Graduate Division, students intending to become candidates for the doctoral program must pass a written qualifying examination administered by the Department. The language requirements for the Ph.D. degree in botany are usually met by examinations or course work in one of the following: French, German, Spanish, or Russian. Preparation in the languages before application to graduate school is strongly recommended.

Students working toward a teaching credential should consult the UCLA ANNOUNCEMENT OF THE SCHOOL OF EDUCATION for general requirements.

**Lower Division Courses**

(See also Biology)

**10. Plants and Civilization.**

Lecture, three hours; lecture-demonstration, one hour. Prerequisite: Biology 2 or 181A-181B. The importance of plants to man's social and economic development; man's role in modification and distribution of plants. Mr. Schroeder

**12. Taxonomy and Ecology of Ornamental Plants.**

(Formerly numbered Agricultural Science 181.) Lecture, one hour; laboratory and field trips, nine hours. Prerequisite: Biology 2, the equivalent, or consent of the instructor. The origin, classification, and identification of the more important ornamental plants in southern California with special emphasis on their environmental requirements and adaptation. A course primarily for art students majoring in design. Mr. Stoutemyer

**Upper Division Courses****102. The Soil as a Medium for Plant Growth.**

Lecture. Prerequisites: Biology 1A-1B, or the equivalent. A general treatment of soil development, its physical and chemical properties as they relate to plant growth; soil resources, management and conservation. Mr. Lunt

**103A-103B. The Natural History of Plants.**

Students must complete both courses in order to receive credit. Lecture, two hours; laboratory, four hours. Prerequisites: Biology 1A-1B, or the equivalent. The evolution and development of plant form; a comparison of vegetative and reproductive systems among major plant groups. Mr. Phinney

**104. Environmental Biology.**

(Same as Zoology 104.) Lecture, three hours; laboratory, three hours. Prerequisite: Biology 1A-1B, or the equivalent. Introduction to the ecology of animals and plants, their morphological, behavioral and physiological adaptations, and the growth, distribution and evolution of their populations. The Staff

**107. Comparative Genetics.**

(Formerly numbered 186. Same as Bacteriology 107 and Zoology 107.) Lecture, four hours. Prerequisites: Biology 1A-1B, or the equivalent. Mendelian principles; the gene: its structure, function, and chemistry, with emphasis on mutation, coding, regulation, and transmission. The Staff

**109. Plant Physiology.**

(Formerly numbered 107.) Lecture, two hours; laboratory, six hours. Prerequisites: Biology 1A-1B, or the equivalent. Physiological principles underlying soil plant relations; translocation and transpiration; photosynthesis; chemical regulation of growth; photoperiodism and photomorphogenesis. The Staff

**111. Cell Structure.**

Lecture, four hours; laboratory, three hours. Prerequisites: Biology 1A-1B, or the equivalent. Structural aspects of cells and tissues in relation to function. The Staff

**113. Plant Cell Physiology.**

Lecture, three hours; laboratory, three hours. Prerequisites: Biology 1A-1B, or the equivalent. General physiology of plant cells and organelles with emphasis on the cell wall, chloroplasts, other plastids, mitochondria, the central vacuole, photosynthesis, and physical-chemical properties of membranes. Mr. Nobel

**115. Marine Botany.**

Lecture, two hours; laboratory, six hours. Prerequisites: Biology 1A-1B, or the equivalent. A survey of the littoral and sublittoral plant life occurring along the coast of California with emphasis on systematics, morphology, and ecology. The Staff

**117. Taxonomy and Distribution of Seed Plants.**

(Formerly numbered 151 and 155.) Lecture, two hours; laboratory, six hours; field trips. Prerequisites: Biology 1A-1B, or consent of the instructor. A taxonomic survey of the families of seed plants; historical and ecological factors responsible for past and present distributions. Miss Mathias

**119. Mycology.**

Lecture, two hours; laboratory, six hours. Prerequisites: Biology 1A-1B, or the equivalent. Structure, development, and classification of the important groups of fungi. The Staff

**151. Developmental Plant Anatomy.**

(Formerly numbered 108 and 109.) Lecture, two hours; laboratory, four hours. Prerequisite: courses 103A-103B. A study of the ontogeny of the vascular plant body and comparisons of that development among the major plant taxa; discussion of the concepts of plant development. Mr. Phinney

**153. Plant Population Ecology.**

(Formerly numbered 150 and 152.) Lecture, two hours; laboratory, six hours; field trips. Prerequisite: course 105, or the equivalent. A study of genetic and ecological variation, structure, and distribution of plant populations emphasizing field studies of selected populations and ecosystems. Mr. Thompson

**163. Cytogenetics.**

(Same as Zoology 163.) Lecture, two hours; laboratory, six hours. Prerequisite: course 107. The fundamentals of cytogenetics. Heredity as related to cytogenetical phenomena.

**199. Special Studies. (½ course)**

Prerequisite: Senior standing and consent of instructor. May be repeated for a total of one course credit toward the bachelor's degree. The Staff

**Graduate Courses****201. Comparative Genetics Laboratory.**

(Formerly numbered 136C. Same as Zoology 201.) Laboratory, nine hours. Prerequisite: course 107 (may be taken concurrently). Experimental techniques demonstrating recombination, mutagenesis, biochemical pathways, complementation, and cytogenetics of plants, animals, and microorganisms. The Staff

**202. Gene Structure and Function.**

(Formerly numbered 222. Same as Microbiology 202 and Zoology 202.) Lecture. Prerequisites: course 107 and Chemistry 153 or consent of the instructor. The genetic coding of information and its transfer from DNA through RNA to protein; the operon model and other aspects of regulatory genetics, mutations and genetic fine structure.

**203. Chromosome Structure and Replication.**

(Same as Microbiology 203 and Zoology 203.) Prerequisites: course 107 and Chemistry 153, or consent of the instructor. A survey of biochemical and biophysical investigations of the structure and replication of chromosomal nucleic acids with emphasis on bacterial and viral systems. Mr. Ray

**204. Evolution and Population Genetics.**

(Formerly numbered 224. Same as Zoology 204.) Lecture, two hours; individual study. Prerequisite: courses 105 and 107. Genetic mechanisms of evolutionary change. Mr. Lewis

**205A-205F. Topics in Genetics.**

(Formerly numbered 225A-225F. Same as Zoology 205A-205F.) Lecture. Prerequisites: course 107 and consent of the instructor. Intensive study of selected topics. The Staff

**206A-206F. Advanced Genetics Laboratory.**

(Formerly numbered 226A-226F. Same as Zoology 206A-206F.) Laboratory, nine hours. Prerequisites: course 107 and consent of the instructor. A course designed to give the student a working knowledge of a particular group of organisms or concepts. The Staff

**211A-211F. Advanced Plant Physiology.**

(½ course each)

Lecture. A survey devoted to the intensive study of photosynthesis, growth and growth regulators, respiratory metabolism, nitrogen and intermediary metabolism, mineral nutrition and transport, development and reproduction.

Mr. Biale, Mr. Laties, Mr. Nobel

**215. Advanced Plant Taxonomy.**

(Formerly numbered 221.) Lecture, two hours; laboratory, four hours; field trips. The principles, concepts, and methods of plant taxonomy.

Mr. Lewis, Miss Mathias, Mr. Thompson

**217. Advanced Plant Ecology.**

(Formerly numbered 171.) Lecture, two hours; laboratory, field study, and special problems, six hours. The origin and development of ecological concepts. Principles and techniques of the quantitative analysis of plant-environmental relationships.

The Staff

**219A-219F. Advanced Plant Morphology.**

(½ course each)

Lecture. A survey of the major groups of plants, covering a period of two years. Each quarter will be devoted to an intensive study of one of the following groups: algae, fungi, bryophytes, pteridophytes, gymnosperms, angiosperms.

The Staff

**221. Advanced Plant Anatomy. (½ course)**

Lecture. A review of contemporary studies of vascular plant structure. The fine structure of plant cells, tissues and embryonic zones including discussions of experimental studies on developing systems *in vivo*.

The Staff

**252A-252B-252C. Seminar in Plant Ecology.**

(½ course each)

The Staff

**253A-253B-253C. Seminar in Plant Structure.**

(½ course each)

The Staff

**254A-254B-254C. Seminar in Plant Physiology.**

(½ course each)

The Staff

**255A-255B-255C. Seminar in Systematics.**

(½ course each)

The Staff

**258A-258B-258C. Seminar in Genetics.**

(½ course each)

The Staff

## Individual Study and Research

**596AA-596ZZ. Directed Individual Studies.**

May be repeated indefinitely. Letter grades will be assigned. Prerequisites: Graduate standing and consent of the instructor. **The Staff**

**597AA-597ZZ. Preparation for Comprehensive Examination for the Master's Degree or Qualifying Examination for the Ph.D.**

May be repeated once. Course will be graded Satisfactory/Unsatisfactory. Prerequisites: Graduate standing and consent of the instructor. **The Staff**

**598AA-598ZZ. Master's Thesis Research and Writing.**

May be repeated once. Letter grades will be assigned. Prerequisites: Graduate standing and consent of the instructor. **The Staff**

**599AA-599ZZ. Doctoral Dissertation Research and Writing.**

May be repeated indefinitely. Letter grades will be assigned. Prerequisites: Advancement to doctoral candidacy and consent of instructor. **The Staff**

**BUSINESS ADMINISTRATION**

(Department Office, 3250 Graduate School of Business Administration)

William F. Brown, Ph.D., *Professor of Marketing.*

Elwood S. Buffa, Ph.D., *Professor of Operations Management.*

Leland S. Burns, Ph.D., *Professor of Urban Land Economics.*

Joseph D. Carrabino, Ph.D., *Professor of Management.*

A. B. Carson, Ph.D., C.P.A., *Professor of Accounting.*

Fred E. Case, D.B.A., *Professor of Urban Land Economics.*

James V. Clark, D.B.A., *Professor of Organizational Development.*

Louis E. Davis, M.S., *Professor of Organizational Sciences and Research Socio-Technical Scientist, Institute of Industrial Relations.*

Benjamin Graham, B.S., *Professor of Business Administration in Residence.*

James R. Jackson, Ph.D., *Professor of Business Administration.*

Neil H. Jacoby, Ph.D., LL.D., *Armand Hammer Professor of Business Economics and Policy.*

Raymond J. Jessen, Ph.D., *Professor of Business Statistics.*

Erwin M. Keithley, Ed.D., *Professor of Business Administration.*

Paul Kircher, Ph.D., C.P.A., *Professor of Accounting and Information Systems.*

Harold Koontz, Ph.D., *Mead Johnson Professor of Management.*

Harry Markowitz, Ph.D., *Professor of Quantitative Methods.*

Frederic Meyers, Ph.D., *Professor of Industrial Relations and Research Economist, Institute of Industrial Relations.*

S. H. Nerlove, A.M., *Professor of Business Administration Retired.*

Irving Pfeffer, Ph.D., *Professor of Insurance.*

Barry M. Richman, Ph.D., *Professor of Management and International Business.*

George W. Robbins, M.B.A., *Professor of Marketing.*

John P. Shelton, Ph.D., *Professor of Finance.*

Harry Simons, M.A., C.P.A., *Professor of Accounting.*

R. Clay Sprowls, Ph.D., *Professor of Business Administration.*

George A. Steiner, Ph.D., Litt.D., *Professor of Management and Public Policy.*

Robert Tannenbaum, Ph.D., *Professor of Behavioral Science.*

J. Fred Weston, Ph.D., *Professor of Finance and Business Economics.*

Robert M. Williams, Ph.D., *Professor of Business Economics and Statistics.*

Ralph M. Barnes, Ph.D., *Emeritus Professor of Production Management and Engineering.*

Ralph Cassady, Jr., Ph.D., *Emeritus Professor of Marketing.*

John C. Clendenin, Ph.D., *Emeritus Professor of Finance.*

Ira N. Frisbee, M.B.A., C.P.A., *Emeritus Professor of Accounting.*

†Leo Grebler, Ph.D., *Emeritus Professor of Urban Land Economics.*

Ralph C. Hoerber, J.D., Ph.D., *Emeritus Professor of Business Law.*

Wilbert E. Karrenbrock, Ph.D., *Emeritus Professor of Accounting.*

† Recalled to active service.

- †Jacob Marschak, Ph.D., *Emeritus Professor of Business Administration and Economics.*
- Wayne L. McNaughton, Ph.D., *Emeritus Professor of Business Administration.*
- Cyril J. O'Donnell, Ph.D., *Emeritus Professor of Business Organization and Policy.*
- Theodore A. Andersen, Ph.D., *Associate Professor of Business Economics and Finance.*
- Robert B. Andrews, Ph.D., *Associate Professor of Operations Management.*
- John W. Buckley, D.B.A., *Associate Professor of Accounting and Information Systems.*
- David K. Eiteman, Ph.D., *Associate Professor of Finance.*
- Walter A. Fogel, Ph.D., *Associate Professor of Industrial Relations, and Associate Research Economist, Institute of Industrial Relations.*
- Arthur M. Geoffrion, Ph.D., *Associate Professor of Quantitative Methods; Associate Director, Western Management Science Institute—Operations Research Division.*
- Glenn W. Graves, Ph.D., *Associate Professor of Quantitative Methods.*
- Alfred E. Hofflander, Jr., Ph.D., *Associate Professor of Finance and Insurance.*
- John Hutchinson, Ph.D., *Associate Professor of Industrial Relations, and Associate Research Political Scientist, Institute of Industrial Relations.*
- Harold H. Kassarian, Ph.D., *Associate Professor of Business Administration.*
- Archie Kleingartner, Ph.D., *Associate Professor of Industrial Relations, and Associate Research Economist, Institute of Industrial Relations.*
- James B. MacQueen, Ph.D., *Associate Professor of Business Administration.*
- Robert Hal Mason, Ph.D., *Associate Professor of Business Administration.*
- Fred Massarik, Ph.D., *Associate Professor of Behavioral Science and Industrial Relations, and Associate Research Behavioral Scientist, Institute of Industrial Relations.*
- William H. McWhinney, Ph.D., *Associate Professor of Organizational Behavior.*
- Frank G. Mittelbach, M.A., *Associate Professor of Business Administration in Residence and Associate Research Economist.*
- Rosser T. Nelson, Ph.D., *Associate Professor of Business Administration.*
- Alfred Nichols, Ph.D., *Associate Professor of Business Economics.*
- Frank E. Norton, Ph.D., *Associate Professor of Business Economics.*
- R. Bruce Ricks, Ph.D., *Associate Professor of Finance.*
- Keith V. Smith, Ph.D., *Associate Professor of Finance and Business Economics.*
- Peter Vaill, D.B.A., *Associate Professor of Business Administration.*
- Michael D. Yoshino, Ph.D., *Associate Professor of Business Administration.*
- Ichak Adizes, Ph.D., *Assistant Professor of Management and International Business.*
- James Bettman, Ph.D., *Assistant Professor of Operations Management.*
- John M. Burt, Jr., Ph.D., *Assistant Professor of Operations Management.*
- Gary M. Cadenhead, Ph.D., C.P.A., *Assistant Professor of Accounting and Information Systems.*
- Michael Chatfield, D.B.A., C.P.A., *Assistant Professor of Accounting.*
- Samuel A. Culbert, Ph.D., *Assistant Professor of Behavioral Science.*
- James S. Dyer, Ph.D., *Assistant Professor of Operations Management.*
- Donald Erlenkotter, Ph.D., *Assistant Professor of Operations Management.*
- Eric Flamholtz, Ph.D., *Assistant Professor of Information Systems.*
- Richard A. Goodman, D.B.A., *Assistant Professor of Business Administration.*
- Maurice Goudzwaard, Ph.D., *Assistant Professor of Finance.*
- J. Morgan Jones, Ph.D., *Assistant Professor of Business Administration.*
- Basil A. Kalymon, Ph.D., *Assistant Professor of Quantitative Methods.*
- Clement Krouse, Ph.D., *Assistant Professor of Business Economics.*
- Steven A. Lippman, Ph.D., *Assistant Professor of Quantitative Methods.*
- Richard O. Mason, Ph.D., *Assistant Professor of Information Systems.*
- John J. McDonough, D.B.A., *Assistant Professor of Accounting and Information Systems.*

† Recalled to active service.

William W. McKelvey, Ph.D., *Assistant Professor of Organizational Sociology.*  
 Ephraim R. McLean, Ph.D., *Assistant Professor of Information Systems.*  
 Daniel J. B. Mitchell, Ph.D., *Assistant Professor of Industrial Relations.*  
 Theodore J. Mock, Ph.D., *Assistant Professor of Accounting and Information Systems.*  
 John Morse, Ph.D., *Assistant Professor of Behavioral Science.*  
 Masao Nakanishi, Ph.D., *Assistant Professor of Business Administration.*  
 David R. Peters, Ph.D., *Assistant Professor of Behavioral Science.*  
 Hans Schöllhammer, D.B.A., *Assistant Professor of Management Theory and International Business.*  
 Philip J. Schreiner, Ph.D., *Assistant Professor of Business Administration.*  
 James Warren, Ph.D., *Assistant Professor of Finance.*  
 Donald Woods, D.B.A., *Assistant Professor of Finance.*  
 Burton Zwick, Ph.D., *Assistant Professor of Finance.*



Robert Buttrey, LL.B., C.P.A., *Lecturer in Accounting.*  
 Lee G. Cooper, M.A., *Acting Assistant Professor of Marketing.*  
 Eugene P. Durbin, Ph.D., *Lecturer in Business Administration.*  
 Lee C. Garrison, Jr., M.A., *Lecturer in Marketing.*  
 Michael E. Granfield, B.A., *Acting Assistant Professor of Urban Land Economics.*  
 Clarence J. Huizenga, M.S., *Lecturer in Business Economics.*  
 Maxwell Kaufman, M.B.A., *Lecturer in Finance.*  
 Joan K. Lasko, Ph.D., *Lecturer in Behavioral Science.*  
 Paul Prasow, Ph.D., *Senior Lecturer in Industrial Relations, and Associate Director, Institute of Industrial Relations.*  
 Sol Rabin, M.C.P., *Acting Assistant Professor of Business Economics.*  
 Anthony P. Raia, Ph.D., *Acting Associate Professor of Management Theory.*  
 Donald Ratajczak, B.A., *Acting Assistant Professor of Business Administration.*  
 Fred Schmidt, B.A., *Senior Lecturer in Business Administration, and Research Economist, Institute of Industrial Relations.*  
 Warren Schmidt, Ph.D., *Senior Lecturer in Behavioral Science.*  
 Edward V. Sedgwick, Ph.D., *Lecturer in Management Theory.*  
 Arthur J. Shedlin, M.A., *Lecturer in Business Administration.*  
 Robert Singleton, M.A., *Acting Assistant Professor of Business Administration.*  
 Thaddeus Spratlen, Ph.D., *Acting Associate Professor of Marketing.*  
 Kenneth W. Thomas, B.A., *Acting Assistant Professor of Behavioral Science.*

#### Lower Division Course

#### 1A-1B. Elementary Accounting.

Prerequisite: sophomore standing. Course 1A is prerequisite to course 1B. An introduction to accounting theory and practice. The first quarter presents the recording, analyzing and summarizing procedures used in preparing balance sheets and income statements. The second quarter includes payroll and tax accounting, partnership and corporation accounts, manufacturing and cost accounting and supplementary statements. The Staff

#### Upper Division Courses

Upper division courses in business administration are open to all University students who have completed the necessary prerequisites. Courses 1A, 1B, Economics 1 and 2, and Mathematics 2C are prerequisites to all upper division courses in Business Administration.

#### BUSINESS ECONOMICS

##### 100. Business Economics.

Prerequisite: Mathematics 2A-2B-2C, course 115A (may be taken concurrently). Required of all students in their first quarter of residence. Effort of the enterprise to secure profits, nature of demand for its products. Costs and production. Allocation of resources through competition. Forms of market competition. Relation of size to efficiency. Markets for productive factors. Incentives and growth, capital budgeting.

Mr. Krouse, Mr. Nicols, Mr. Smith

##### 101. Business Fluctuations and Forecasting.

Prerequisite: courses 100, 115A, and Economics 160 (may be taken concurrently). Required of all students in their second quarter of residence or immediately following course 100. How the enterprise reacts to general economic fluctuations and how its decisions, in turn, affect them. Important forces in past fluctuations. Behavior of indexes of business activity. Appraisal of forecasting techniques. Entrepreneurial and public policies to mitigate business fluctuations.

Mr. Granfield, Mr. Norton, Mr. Ratajczak

**BUSINESS LAW**

**106. Legal Analysis for Business Managers.**

Not open to students who have credit for course 18 (Berkeley) or equivalent. Must be completed in the first year in residence. Significance and growth of the law; law in its relationship to business, with special emphasis on current problems; coverage of the law of contracts, agency sales, property, negotiable instruments, business organizations including the functions of inside and outside counsel and trade regulations. The Staff

**BUSINESS COMMUNICATIONS**

**109. Business Communications.**

(Formerly numbered 110.) The development of information, skills, and attitudes as they relate to the types of communication required in the management of enterprises. Mr. Keithley, Mr. Schreiner

**QUANTITATIVE METHODS**

**111. Introduction to Operations Research.**

Prerequisite: Mathematics 11C and course 115A. Survey of Operations Research from an applied rather than theoretical viewpoint. Emphasis on the formulation of mathematical models and the most basic techniques for obtaining useful results. Problem types discussed: allocation, competition, inventories, networks, project management, waiting lines, replacement, sequencing, transportation. Mr. Jackson, Mr. Kalymon

**113A. Electronic Computers in Business.**

An introduction to electronic computers and computer programming with substantial laboratory work in problem solving using computers and both machine language and FORTRAN. Mr. Sprowls

**113B. Electronic Computer Methods.**

Prerequisite: course 113A or consent of the instructor. A continuation of course 113A with emphasis upon solving problems related to business and general social sciences with such languages as COBOL for data processing, IPL for list processing and others. Mr. Sprowls

**115A. Business Statistics.**

Prerequisite: Mathematics 2A-2B-2C (formerly 37A-37B) or the equivalent. Elements of probability, probability distributions, estimation and confidence intervals, tests of significance and of hypotheses, linear regression and correlation, time series analysis and principles of index numbers. Applications to the analysis of and the decision-making aspects of everyday business problems. The Staff

**115B. Statistical Forecasting Techniques.**

(Formerly numbered 117.) Prerequisite: course 115A or equivalent. Analysis of the important business indexes in current use. Index number construction. Methods of measuring business trends and fluctuations with applications to business forecasting. Serial and multiple correlation. The use of electronic computers in the analysis of business series. The Staff

**115E. Statistical Survey Techniques.**

Prerequisite: course 115A. Principles and methods of designing statistical surveys and analyzing the data therefrom. Basic ideas and methods of sampling: simple random, stratified, multi-stage design. Techniques for constructing sampling frames. Techniques of detecting and controlling nonsampling errors. Mr. Jessen

**115F. Statistical Experiment Techniques.**

Prerequisite: course 115A. Principles and methods of designing statistical experiments and analyzing the data therefrom. Simple randomized, randomized block, Latin-square designs; factorial experiments. Methods of choosing experimental units. Mr. Jessen

**116A. Statistical Methods: Decision.**

Prerequisite: course 115A or graduate status. Statistical decision under uncertainty; statistical decision rules and their evaluation; Bayesian inference; applications to business problems. Mr. Jones, Mr. Nelson

**116B. Statistical Methods: Analysis.**

Prerequisite: course 115A or equivalent. Analysis of variance; design and analysis of statistical experiments and surveys; multiple regression and correlation, curvilinear regression; analysis of enumeration data; nonparametric methods. Mr. Jessen

**ACCOUNTING**

**120. Intermediate Accounting.**

Prerequisite: courses 1A-1B or consent of the instructor. The preparation of the principal accounting statements. Recording, valuation, and presentation of cash, temporary investments, receivables, inventories, investments, plant and equipment, intangibles, current obligations, long-term debt, paid-in capital, and retained earnings. Statement analysis. Statement of application of funds. The Staff

**120M. Management Accounting.**

Prerequisite: course 120 or consent of the instructor. Not open to students who have credit for course 403A. Management Accounting theory and methods; formulation and analysis of management reports; internal control; planning and budgeting; cost-volumes-profit analysis; elements of cost accounting; price-level accounting; learning curves and capital budgeting. The Staff

**122. Cost Accounting.**

Prerequisite: 120M or consent of the instructor. The nature, objectives, and procedures of cost accounting and control; job costing and process costing; accounting for manufacturing overhead; cost budgeting; cost reports; joint-product costing; distribution cost; standard costs; differential cost analysis; profit-volume relationships and break-even analysis. Mr. Carson

**124. Advanced Accounting**

Prerequisite: courses 120, 122 or consent of the instructor. Partnerships and joint ventures; installment sales and consignment sales; home office and branch relationships; corporate combinations; the preparation of consolidated statements; foreign branches and subsidiaries; receiverships, estates and trusts; governmental units; actuarial science. Mr. Chatfield, Mr. Simons

**127. Federal Tax Accounting.**

Prerequisite: course 124 or consent of the instructor. A study of the fundamentals of federal income taxation with emphasis on the taxation of the income of individuals. Mr. Buttrey

**FINANCE**

Economics 160 is required of all students in the School of Business Administration.

**130. Business Finance.**

A study of the forms and sources of financing business firms large and small, corporate and noncorporate. The emphasis is on financial planning and developing judgment in formulating decisions on financial problems. Financial problems are also considered in their social, legal, and economic effects.

Mr. Kaufman, Mr. Warren, Mr. Woods

**133. Investment Principles and Policies.**

Principles underlying investment analysis and policy; salient characteristics of governmental and corporate securities; policies of investment companies and investing institutions; relation of investment policy to money markets and business fluctuations; security price-making forces; construction of personal investment programs.

Mr. Kaufman, Mr. Ricks, Mr. Smith

**RISK BEARING AND INSURANCE****135. Principles of Insurance.**

Basic principles of risk and insurance and their applications to business management and personal affairs. Analysis of concepts and methods of handling risks; insurance carriers, contracts, and underwriting; loss prevention and settlement; government insurance programs; economic functions of insurance.

Mr. Hofflander, Mr. Pfeffer

**OPERATIONS MANAGEMENT****140. Elements of Production and Operations Research.**

Prerequisite: course 115A or consent of the instructor. Principles and decision analyses related to the effective utilization of the factors of production in manufacturing and nonmanufacturing activities for both intermittent and continuous systems. The study of production organizations, analytical models and methods, facilities design, and the design of control systems for production operations. The Staff

**INDUSTRIAL RELATIONS****150. Elements of Industrial Relations.**

Note: Students preparing for an industrial relations field of concentration are advised to take Business Administration 180 (formerly 106) before this course. Principles and methods of effectively utilizing human resources in organizations. The relationship between social, economic, and other environmental factors and current problems in industrial relations. The Staff

**MARKETING****160. Elements of Marketing.**

A survey of the major marketing methods, institutions, and practices. The subjects of retailing, wholesaling, distribution channels, marketing legislation, advertising, cooperative marketing, pricing, marketing research, and marketing costs are treated from the standpoint of consumers, middlemen, and manufacturers.

Mr. Nakanishi

**\*162. Retail Store Management.**

Prerequisite: course 160. A study of retailing from the standpoint of management. Includes the case-method treatment of such problems as buying, sales promotion, inventory planning and control, pricing, style merchandising, and general management problems.

Mr. Brown

**163. Advertising Principles and Policies.**

Lecture, three hours; laboratory, two hours. Prerequisite: course 160. The preparation, use and administration of advertising, emphasizing the use of research to direct and measure the effectiveness of each stage in the operation. The economic and social implications of advertising also are evaluated.

Mr. Kassarian

**\*165. Sales Management.**

Prerequisite: course 160 or consent of the instructor. A case-method study of sales strategy from the managerial viewpoint. Includes merchandising policies, distribution policies, forecasting and planning, sales method and campaigns, pricing, sales department organization, management of the sales force, and budgetary control of sales.

Mr. Brown

**\*169. Marketing Policies. (1½ courses)**

Lecture, four hours; laboratory, four hours. Prerequisite: course 160 and senior standing. Marketing management and research methods, including product and promotional policies, distribution channel decisions, the theory of pricing and price policies, and restrictive legislation. Business cases constitute the basis for class discussion. Laboratory periods provide practice in the application of principles.

Mr. Brown, Mr. Garrison

**TRANSPORTATION****170. Physical Distribution Management.**

Prerequisite: Economics 175 or consent of the instructor. Principles of purchasing transportation services of all types by business managers analysis. Selection of transportation alternatives as a distribution logistics problem of overall product spatial activities.

Mr. Quinn

**171A-171B. Transportation Management.**

Prerequisite: Economics 175 or consent of the instructor. Management of transportation enterprises. Application of management principles and techniques to problems faced by managers in transport enterprises. Includes impact of public policy, capital facilities, industry structure, costs, operations, pricing, and intercompany relationships. The Staff

**URBAN LAND ECONOMICS****175. Elements of Real Estate and Urban Land Economics.**

(Formerly numbered 180.) An examination of business decision-making as related to logical forces shaping cities and influencing real estate market functions and land uses. Emphasis is placed on decision-making as it relates to appraising, building, financing, managing, marketing and using urban property.

Mr. Case, Mr. Mittelbach, Mr. Rabin

**176. Real Property Valuation.**

(Formerly numbered 181.) Prerequisite: course 175 or consent of the instructor. Methods of developing criteria for establishing land values and selecting alternative uses and locations. Ability to reason and choose effectively is cultivated through attention to the theoretical framework underlying property valuation.

Mr. Case

**177. Urban Economics and Business Policy.**

(Formerly numbered 182.) Prerequisite: course 175 or consent of the instructor. Business policies involved in converting raw land to urban uses. Emphasis on private, local governmental and Federal

\* Course to be phased out, presumably by 1970.



programs for housing and construction as related to economic stability and progress as well as the efficient use of urban space.

Mr. Burns, Mr. Case, Mr. Ratajczak

## BEHAVIORAL SCIENCE

### 180. Behavioral Science Foundations.

(Formerly numbered 106.) An introduction to selected concepts in behavioral science, their integration and application to management. Organization, group, cultural, individual behavior in relation to managerial environment and functional fields of business administration. Simulations and demonstrations of behavioral science principles.

Mrs. Lasko, Mr. McKelvey, Mr. Morse

### 182. Leadership Principles and Practice.

(Formerly numbered 152.) Prerequisite: senior standing. Knowledge and skills leading to effectiveness in interpersonal relations. Understanding oneself as a leader, and others as individuals and as members of working groups. Understanding of group process, including group leadership. Lectures and "sensitivity training" laboratory.

Mr. Culbert, Mr. Peters and The Staff

## MANAGEMENT THEORY AND POLICY

### 190A-190B. Organization and Management Theory.

Prerequisite: senior standing. Required of all business administration students. A study of the principles of business management. Emphasis is placed upon the application of these principles to the general, as distinguished from the functional, management of enterprise by means of readings and case studies.

The Staff

## ADVANCED STUDY IN BUSINESS ADMINISTRATION

### 199. Special Studies in Business Administration.

( $\frac{1}{4}$  to 2 courses)

Prerequisite: senior standing and consent of the instructor and the dean by special petition available in the Graduate Student Affairs Office.

The Staff

## Graduate Courses

## BUSINESS ECONOMICS

### 200. Managerial Economics.

Prerequisite: courses 100, 101, or 401, 406 and 115A or 407. Analysis of decision-making in the enterprise. The market environment measurement of the influence of policy and nonpolicy variables on sales and costs. Sales, cost, and profit forecasting. Capital budgeting and criteria for investment decisions. Inventory, depreciation, dividend and financial policies.

Mr. Krouse, Mr. Nicols, Mr. Weston

### 201A. Business Forecasting.

(Formerly numbered 201.) Prerequisite: courses 100, 101 or 401, 406 and 115A or 407. The role of business forecasting in managerial planning. Principles and methods of forecasting. Evaluation of the reliability of existing forecasting techniques. Covers both short-term and long-term forecasting of industry, regional and national business trends.

Mr. Norton, Mr. Ratajczak, Mr. Williams

### 201B. Industry Forecasting.

Prerequisite: courses 200, 201A. Evaluation of various methodologies found useful in preparing industry forecasts; differences between short- and long-range forecasting techniques, etc.

Mr. Andersen, Mr. Ratajczak

### 201C. Regional Economic Forecasting.

Prerequisite: course 201A. Forecasting of economic activity in a region; emphasizing special problems such as population and industry migration; the effects of external forces on the regional economy.

Mr. Granfield, Mr. Rabin

### 202A. Economic Policy and Business Environment.

(Formerly numbered 202.) Prerequisite: consent of the instructor. Analysis of economic policies shaping the business policy; stabilizing policy instruments; structural policies for efficiency and progress; policy needs for the future. Treats policy formation and administration as well as design.

Mr. Jacoby, Mr. Norton

### 202B. Competition and Business Policy.

Prerequisite: course 200. Theory of price and non-price competition in different market structures; analysis of structure and competitive practices of various industries; methods of measuring competition, etc.

Mr. Jacoby, Mr. Weston

### 203A. Economics of Decision.

(Same as Economics 203A.) Prerequisite: rudiments of economic theory, calculus, and probabilities or statistics (e.g., course 116A). Norms and facts of decision-making in household, business, and government. Consistent behavior in terms of personal utilities and probabilities. Departures from consistency: stochastic theories of behavior and resulting econometric models.

Mr. Marschak

### 203B. Economics of Information.

(Same as Economics 203B.) Prerequisite: rudiments of economic theory of the firm, and of calculus and probabilities or statistics (e.g., course 116A); course 203A, or consent of the instructor. Optimal decision and information rules. Amount, cost and value of information.

Mr. Marschak

### 203C. Economics of Organization.

(Same as Economics 203C.) Prerequisite: course 203A-203B. Rational models of teams. Relation to the theory of games.

Mr. Marschak

### 205A. International Business Economics.

Prerequisite: courses 401, 406 or consent of the instructor. The international business environment, international economic institutions, national and regional trade policies and developments, trends in foreign markets, international monetary problems are studied for their influence on the organization and operation of the international corporation.

Mr. Mason, Mr. Mitchell, Mr. Yoshino

### 205B. Comparative Market Structure and Competition.

Prerequisite: course 205A or consent of the instructor. A comparative study of public policies toward competition, market structures and competitive practices in key industries in selected countries.

Mr. Jacoby, Mr. Williams

### 205C. Business Forecasting for Foreign Economies.

Prerequisite: course 201A or consent of the instructor. Forecasting changes in business activity, population, industrial structure, productivity, Gross National Product, and its components for selected countries.

Mr. Jacoby, Mr. Williams

**208. Selected Topics in Business Economics.**

Prerequisite: courses 200, 201. Special topics in business economics. Current development in theory or practice in business economics. May be repeated for credit.  
The Staff

**QUANTITATIVE METHODS****210A. Mathematical Programming.**

Prerequisite: Mathematics 12A. A comprehensive development of the theory and computational methods of linear programming, with applications to business and related disciplinary areas.

Mr. Graves

**210B. Applied Stochastic Processes.**

Prerequisite: Mathematics 150A or Engineering 120A. Sequential stochastic (usually Markovian) decision processes in discrete and continuous time; emphasis is on problem formulation and the characterization and computation of optimal policies, often via dynamic programming; application to inventory, queueing, maintenance, reliability, and replacement problems.

Mr. Kalyon, Mr. Lippman

**210C. Network Flows and Combinatorial Programming.**

Prerequisite: course 210A. Theory and techniques of discrete models in Operations Research, Integer programming, combinatorial programming, and network flows. Applications to various allocation, coordination, scheduling, and sequencing problems.

Mr. Graves

**211A. Nonlinear Mathematical Programming.**

Prerequisite: Mathematics 12B. Theory, methods, and application of the optimization of nonlinear systems. Review of classical optimization methods; optimality and duality theory for convex programs; main computational approaches to convex programming; survey of current computer codes and computational experience.

Mr. Geoffrion, Mr. Graves

**211B. Large-Scale Mathematical Programming.**

Prerequisite: two quarters of previous work in linear and nonlinear programming. Theory and computational methods for optimizing large-scale linear and nonlinear programs. Exploitation of special structures with combinatorial, dynamic, multi-divisional, and stochastic aspects to obtain practical solution procedures in spite of large numbers of variables and/or constraints.

Mr. Geoffrion, Mr. Graves

**214A. Business Systems.**

(Formerly numbered 213.) Prerequisite: course 118B or consent of the instructor. Analysis and design problems of business systems that utilize electronic computers.

Mr. Sprowl

**214B. Behavioral Science Models.**

Prerequisite: consent of the instructor. Formulation, analysis, and interpretation of mathematical models in the behavioral sciences. Emphasis is on stochastic process models for aspects of individual and group behavior such as learning, problem solving, classification, communication, bargaining, and social exchange systems.

Mr. MacQueen

**214C. Computer Simulation.**

Prerequisite: computer programming and some background in probability and statistics. Computer

simulation methodology including design, operating procedures, and analysis of simulation experiments. Applications of simulation with special attention to applications of digital computer simulation in business and operations research.

Mr. Markowitz, Mr. Nelson

**214D. Advanced Computer Simulation.**

Prerequisite: background in probability, statistics, and optimization techniques; knowledge of SIMSCRIPT or another general purpose simulation language; or consent of instructor. Each student performs a simulation analysis including model selection, computer programming and analysis of implications. General problems and techniques of simulation are discussed in terms of these case studies.

Mr. Markowitz

**215D. Time Series Analysis.**

(Formerly numbered 217.) Prerequisite: course 116B or consent of the instructor. Econometric models and advanced time series analysis in measuring trends and fluctuations in business series, electronic computers in the analysis of business series; input-output analysis; the learning curve.

Mr. Granfield

**215E. Statistical Design of Surveys.**

(Formerly numbered 216.) Prerequisite: course 116B or equivalent. Mathematical theory and practices of statistical survey design and analysis.

Mr. Jessen

**215F. Statistical Design of Experiments.**

(Same as Engineering 275A.) Prerequisite: course 116B and Mathematics 11C. Matrix treatment of linear hypotheses in statistical experimentation. Statistical estimation, tests of hypotheses, analysis of variance, regression models. Randomized blocks, factorial, Latin square, multiple factor and level experiments. Principles of orthogonality, confounding, fractional replication, incomplete block designs with applications.

The Staff

**216A. Queueing Systems: Theory and Applications.**

(Same as Engineering 220A.) Prerequisite: course 210B or Engineering 120A. Analysis of queueing (waiting line) systems. Discrete and continuous time Markov processes; birth and death processes; equilibrium results for single and multiple server queues; method of stages. Priority queueing systems. Applications to communication systems, data-processing systems, time-shared processors, networks of computer and communication systems.

Mr. Kleinrock

**216B. Advanced Queueing Theory and Applications.**

(Same as Engineering 220B.) Prerequisite: course 216A. Advanced topics in queueing theory, including Lindley's Integral Equation, Pollaczek method, busy period and virtual waiting time. Method of collective marks. Inequalities and bounds in queueing theory. Tandem queues. An algebra for queues. Applications to communication nets, computer systems and time-sharing systems.

Mr. Kleinrock

**217A. Statistical Decision Theory.**

Prerequisite: course 116A or equivalent; Mathematics 152A recommended. Relationships among statistical decision theory, game theory, and classical statistical inference, with emphasis on sequential analysis and dynamic decision processes; axiomatic foundations, Bayes' and minimax solutions, applications to selected models of dynamic decision problems in business.

Mr. MacQueen

**217B. Game Theory.**

Prerequisite: course 116A; Mathematics 152A recommended. Nature of models for rational behavior in presence of conflicts of interests, zero-sum and nonzero-sum games, two-person and many-person games, state of the art, philosophical and computational limitations, relations with individual and group decision making. Mr. Jackson

**218A. Selected Topics in Operations Research.**

(¼ to 1 course)

Prerequisite: consent of the instructor. Newly developing topics and viewpoints. Topics have included reliability and optimal maintenance theory, large-scale distribution/inventory systems, and Markovian decision processes under uncertainty. May be repeated for credit. The Staff

**218B. Selected Topics in Computer Methods.**

(¼ to 1 course)

Current developments in principles and practices. Analysis of recent literature. Topics and instructors will be announced when they become known. May be repeated for credit. The Staff

**218C. Selected Topics in Business Statistics.**

(¼ to 1 course)

Prerequisite: consent of the instructor. Special topics in statistical methods. Current developments in statistical theory and practice. Analysis of recent literature. Topics and instructors will be announced when they become known. May be repeated for credit. The Staff

**218D. Current Problems in Operations Research.**

(¼ to 1 course)

Current research on a variety of topics in the general area of operations research, presented by invited university and outside speakers. May be repeated for credit. The Staff

**ACCOUNTING AND INFORMATION SYSTEMS****220. The Evolution of Accounting Thought.**

Prerequisite: course 124 or consent of the instructor. The formulation of accounting principles and practices are studied in their historical context and with regard to their socio-economic-political environment. Mr. Chatfield

**221. Institutional Accounting.**

Prerequisite: course 124 or 403. The seminar provides a penetrating analysis of the accounting practices of government and nonprofit institutions. The application of innovative commercial accounting methods to institutional accounting management are investigated and vice versa and current research topics are featured. Mr. Buckley

**222. Industrial Accounting.**

Prerequisite: course 122. A study of industrial and cost accounting problems; theories of cost allocation and absorption; problems of cost budgeting and control. Current cost accounting literature is examined in connection with case studies. The Staff

**223. Verification of Financial Statements.**

Prerequisite: course 124. Problems of examination, verification, and presentation of financial statements from the standpoint of the independent public accountant. Legal and professional responsibilities of public accountants; professional ethics. Relation of examinations to internal controls. The Staff

**224. Accounting Data for Management Purposes.**

A study of accounting procedures to provide management with data to make decisions; types of data required for planning and control; availability and reliability of such data in accounting systems; provision of special-purpose data; conditions of good internal reporting. Mr. Kircher

**225A. Information Systems.**

Prerequisites: course 113A, course 403, or consent of the instructor. Design of information systems. Emphasizes systems concepts, user's requirements, methods of systems analysis, and measurement, coding and classification of data. Use of computerized systems. Utility of information systems relative to the needs of particular organizational decision and control centers.

Mr. Cadenhead, Mr. R. O. Mason, Mr. Mock

**225B. Information Systems for Planning and Control.**

Prerequisite: course 113A or consent of the instructor. Design of systems to produce information for planning and control. Data collection, measurement, storage, processing and communication requirements for planning and control systems. Role of current accounting and budgeting methods. Impact of planning and control information on human behavior.

Mr. Cadenhead, Mr. R. O. Mason, Mr. Mock

**225C. Measurement in Information Systems.**

Prerequisite: familiarity with basic statistics, probability theory, set theory, and accounting, or consent of instructor. A study of the role of measurement in accounting and information systems, from the standpoint of mathematical, economic, behavioral and organizational considerations.

Mr. Mock, Mr. R. O. Mason

**226. International Accounting.**

Prerequisite: graduate status. Comparative analysis of accounting concepts and practices in other countries; study of contrasts between various systems; problems of accounting for international corporations including transfers of funds and income measurement; and accounting influences on economic development. Mr. Buckley, Mr. Kircher

**227A. Advanced Tax Accounting.**

Prerequisite: course 127. Problems in federal and state income, franchise, gift and estate taxes; study of source materials and research methods for ascertaining current rulings and trends in laws and regulations. Mr. Buttrely

**227B. Taxation and Business Policy.**

Tax systems, tax shifting and burden theory. Impact of taxation law and theory on business decisions. Corporate tax planning. The businessman and tax reform. Mr. Buttrely

**228. Advanced Accounting Problems.**

Prerequisite: consent of the instructor. Contemporary financial accounting theory and practice with emphasis upon pronouncements of the American Institute of Certified Public Accountants, and American Accounting Association, and the Securities and Exchange Commission. Application of principles to advanced problems. Mr. Simons

**229A. Accounting Theory.**

Prerequisite: consent of the instructor. A survey of accounting literature, with emphasis on the development of basic accounting concepts. An attempt is made to explain contemporary practice as it has evolved in accordance with basic theory and expanding demands for accounting information.

Mr. Cadenhead, Mr. Carson

**229B. Research Methodology in Accounting.**

Prerequisite: course 229A or consent of the instructor. Design of empirical and theoretical research in accounting. Sources of research problems. Research conduct and methodology in accounting and other fields as they relate to accounting.

Mr. Kircher, Mr. Mason, Mr. Mock

**229C. Special Topics in Accounting.**

Prerequisites: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in accounting. Emphasis on recent contributions to theory, research, and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

The Staff

**229D. Special Topics in Information Systems.**

Prerequisites: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in Information Systems. Emphasis on recent contributions to theory, research and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

The Staff

**FINANCE****230A. Money and Capital Markets.**

(Numbered 230B in 1966-67.) Prerequisite: Economics 135, and course 130 or 408, or consent of the instructor. Application of interest theory and flow of funds analysis to the price determination process in the markets for bonds, mortgages, stocks and other financial instruments. An historical and cross-sectional study of the role of financial markets in economic development.

Mr. Andersen, Mr. Case, Mr. Zwick

**230B. Financial Institutions.**

(Numbered 230A in 1966-67.) Prerequisite: Economics 135 and course 130 or 408 or consent of the instructor. Study of the financial policies and practices of commercial banks, savings and loan associations, pension funds, insurance companies and other major financial institutions. Analysis of the sources and uses of funds, their cost and return, and government regulation of the financial sector.

Mr. Andersen, Mr. Kaufman, Mr. Zwick

**230C. Money and Capital Market Theory.**

Prerequisite: course 230A or 230B. Study of selected aspects of financial institutions and markets, their operation and regulation. Discussion of data sources and research methodology in this area.

Mr. Andersen, Mr. Zwick

**231A. Business Financial Policies.**

(Formerly numbered 232.) Prerequisite: course 130 or 408, or consent of the instructor. Application of principles of finance to the financial management of business enterprises. The program includes reading assignments on principles and methods of fi-

nance, analysis of business case problems, and individual student reports of financial problems of particular corporations.

Mr. Goudzwaard, Mr. Kaufman, Mr. Woods

**231B. Business Finance Theory.**

(Formerly numbered 231.) Prerequisite: courses 130 or 408, or consent of the instructor. Normally taken after course 231A. The social and economic consequences of business financial policies. Projections of aggregate sources and uses of business funds, dividend policy and business saving, possible financing gaps, business and social aspects of mergers and reorganization.

Mr. Shelton, Mr. Woods

**232A. Investment Analysis.**

(Formerly numbered 134.) Prerequisite: 130 or 408 or consent of the instructor. Examination of specific industries, companies, and securities from an investment point of view; sources of information; techniques of analysis; measurement of risks, returns, and investment values; evaluation of corporate credit; preparation of reports. Annual reports of business corporations and current cases are studied.

Mr. Eiteman, Mr. Ricks, Mr. Shelton

**232B. Investment Portfolios.**

Prerequisite: course 130 or 408 or consent of the instructor. Normally taken after course 232A. Focus on entire portfolios rather than individual securities. Review of existing literature on portfolio selection, revision, and measurement and evaluation. Term report involves empirical testing of a portfolio strategy or hypothesis.

Mr. Shelton, Mr. Smith

**232C. Investment Theory.**

Prerequisite: courses 232A and 232B or consent of the instructor. Review of theoretical literature on investment analysis, valuation, and management. Topics include mathematical techniques for valuation of growth securities, competitive returns on alternative investments, the investment decision process, computers in investment decision-making, and functioning of securities markets in the U. S. and abroad.

Mr. Eiteman, Mr. Shelton, Mr. Smith

**233A. International Business Finance.**

(Formerly numbered 231C.) Prerequisite: courses 130 or 408 and 205A, or consent of the instructor. Financial problems of multi-national businesses are studied. Included are the international financial environment, problems surrounding the decision to commit long-term capital to an international venture, and financial techniques for the operation of a multi-national firm.

Mr. Eiteman

**RISK-BEARING AND INSURANCE****235A. Problems in Insurance Management.**

(Formerly numbered 235.) Prerequisite: course 135, or consent of the instructor. Advanced consideration of the problems of insurance management. Treats the actuarial, underwriting, investment, marketing, and regulatory problems relating to insurance activities.

Mr. Hofflander, Mr. Pfeffer

**235B. Risk and Risk Bearing.**

(Formerly numbered 239.) Prerequisite: course 135 or consent of the instructor. Advanced consideration of the theory of risk and risk bearing. The analysis of alternative ways of meeting risk and uncertainty, the scope and limits of insurance, and the economics of insurance.

Mr. Hofflander, Mr. Pfeffer

**236. Life Insurance in Business and Estate Management.**

Prerequisite: course 135 or consent of the instructor. An advanced study of business life insurance and estate programming with emphasis on the analysis, conservation, management and disposition of the individual or business estate.

Mr. Hofflander, Mr. Pfeffer

**237. Property and Casualty Insurance in Business Management.**

Prerequisite: course 135 or consent of the instructor. An advanced treatment of the property and liability risks found in business enterprise, with emphasis on the role of the risk manager in the firm.

Mr. Hofflander, Mr. Pfeffer

**238. Selected Topics in Finance and Insurance.**

Selected topics in the study of financial theories and policies. Models of financial behavior. Study of financial institutions. Relations between theory and institutional practices. May be repeated for credit.

The Staff

**OPERATIONS MANAGEMENT****240A. Deterministic Models of Operational Systems.**

Prerequisite: Mathematics 11C. The use of deterministic models for the analysis of operational systems. Formulation and application of linear, network, and dynamic models. Optimization and heuristic solution techniques.

Mr. Dyer, Mr. Erlenkötter

**240B. Stochastic Models of Operational Systems.**

Prerequisite: courses 116A and 240A. Analytic techniques for stochastic operational systems. Formulation and application of stochastic programming, probabilistic dynamic programming, Markovian, waiting line and information models.

Mr. Burt

**240C. Synthesis of Operational Systems.**

Prerequisite: Mathematics 11C and course 115A. Examination of the design process, alternative design methodologies, value systems and search techniques. Special emphasis on broad aspects of the synthesizing processes underlying the creation of operational systems.

Mr. Andrews

**240D. Simulation of Operational Systems.**

Prerequisite: FORTRAN programming. Fundamentals of modeling and simulation of systems with special attention devoted to business applications of digital computer simulation. Group and individual student projects offer direct experience with computer simulation.

Mr. Nelson

**240E. Research Methods in Socio-Technical Analysis.**

Prerequisite: consent of the instructor. Conceptual foundations for socio-technical analyses of operational systems. Analytical methods for identification and measurement of elements of socio-technical systems, relationships among elements and changes over time in elements and their relationships.

Mr. Davis, Mr. McWhinney

**241A. Work Design and Measurement, I.**

Design of work systems; human engineering; job simplification and motion study; job enlargement and methods change programs; motion study, mechanization, and automation; motivation of workers;

psycho-sociological implications of technological systems.

The Staff

**241B. Work Design and Measurement, II.**

Work measurement by time study, elemental data, and systems of motion-time data; measuring work by statistical methods; work physiology; labor cost control; and the compensation of labor.

The Staff

**242A-242B. Design of Processes and Facilities.**

Prerequisite: courses 240A-240B-240C. Design of intermittent and continuous processes and facilities to transform inputs into desired products or services. Examination of spatial economics, material flow, relative location of facilities, and line balancing.

The Staff

**242C. Design of Socio-Technical Systems.**

Prerequisite: consent of the instructor. Discussion and interpretations field studies leading to the design of socio-technical systems. To be taken concurrently with course 292B.

The Socio-Technical Staff

**243A. Operations Planning and Control.**

Prerequisite: courses 240A and 240B or equivalent. Planning and control models and methods applicable in continuous, intermittent and one-time systems for both manufacturing and nonmanufacturing situations. Forecasting, the role of inventories, aggregate planning, and scheduling.

Mr. Buffa

**243B. Inventory Theory.**

Prerequisite: course 210B or consent of instructor. General discussion of inventory models with emphasis upon characterizing the form of optimal policies and efficient computational methods. Both deterministic and stochastic and discrete and continuous time models are considered.

Mr. Lippman

**243C. Scheduling Theory.**

Prerequisite: course 240A, 240B or equivalent. Analytical and experimental (simulation) scheduling models for single machines, flow-shops, and job-shops. Models include labor and machine limited systems considered from both a local and global point of view.

Mr. Burt, Mr. Nelson

**243D. Integrated Operational Systems.**

(Formerly numbered 242.) Prerequisite: courses 243A-243B. Design and analysis of models of integrated operational systems. Business games and applications of simulation techniques.

Mr. Nelson

**244A. Research and Development Policy.**

Examination of research and development as a process and as an element of a goal oriented organization. Factors affecting invention and innovation; transfer of technology; organizational and behavioral considerations; coupling of science, technology and organizational goals; assessing and forecasting technological futures.

Mr. Goodman

**244B. Project Management.**

Management of development projects. Decision making environment, economic analysis, network analysis, scheduling and control of development projects. Sequential and aggregate development decisions.

Mr. Burt, Mr. Dyer

**245. Scientific Approach to Management.**

(Formerly numbered 249A-249B.) A study of the historical development of the scientific approach to management; analysis of the contributions of the pioneers, Taylor, Gilbreth, Gantt, Fayol and others; evaluation of current trends; case studies.

The Staff

**246. Manufacturing Policy.**

(Formerly numbered 240A-240B.) Case studies in manufacturing companies dealing with broad problems of process planning, product planning, justification of facilities, integration of facilities. Case studies are grouped by industries to study elements of the economics of the industry and the nature of productive processes. The Staff

**247A. Survey of Operations Management.**

Prerequisite: enrollment in the M.S. program. Survey of the research literature in operations management. Seminar reports dealing with special topics. The Staff

**247B. Survey of Operations Management.**

Prerequisite: enrollment in the Ph.D. program. Survey of the research literature in operations management. Seminar reports dealing with special topics. The Staff

**248. Special Topics in Operations Management.**

Studies of advanced subjects of current interest in operational management. Emphasis is on recent developments and the application of specialized knowledge to operational problems. Topics change each offering, and in the absence of significant duplication, the course may be repeated. The Staff

**INDUSTRIAL RELATIONS****250A. Personnel Management.**

Consideration, at an advanced level, of factors underlying the formation and execution of managerial policies relating to the selection, development, adjustment, and motivation of individual employees. Emphasis on independent investigations and presentations by students. Mr. Flamholtz

**250B. Personnel Management.**

Consideration, at an advanced level, of factors underlying the formation and execution of managerial policies relating to employee participative programs, administration of benefits and services, effects of work environment, and evaluation of the personnel program. Emphasis on independent investigations and presentations by students. Mr. Flamholtz

**251. The Management of Labor Relations.**

Consideration, at an advanced level, of the collective bargaining process, the labor-management agreement, the administration of the contract, and the impact on public policy on the management of industrial relations. Case studies, field trips, and visiting lecturers will be part of the seminar curriculum. The Staff

**252. Law and Governmental Policy in Industrial Relations.**

Prerequisite: course 150. Governmental policies on employer-employee relations; historical background; constitutional and common law principles; application of Taft-Hartley, Labor Reform, Antitrust, Anti-Injunction, Fair Labor Standards, Workmen's Compensation and other acts; trends and proposed legislation on labor-management affairs. Mr. Hackler

**253. Settlement of Industrial Disputes.**

Prerequisite: course 150 or equivalent. Principles that underlie adjustments of labor controversies. The character and procedures of arbitration, mediation, fact-finding, and conciliation. Policies of existing agencies dealing with industrial disputes. Mr. Schmidt

**254. Analysis of Labor Markets.**

Prerequisite: consent of the instructor. Problems of verifying hypotheses concerning labor market behavior and the application of data to managerial problems. Problems of operationally defining labor market concepts. Critical evaluation of available labor market data. Case studies applying these data to managerial problems. Mr. Fogel, Mr. Mitchell

**255. Comparative Industrial Relations.**

Prerequisite: course 150 or an elementary knowledge of labor economics. At national and international level historical and contemporary analytical comparison of industrial relations systems within their political, social and economic environments. Included are: the institutions, philosophies and ideologies of labor, management and government and the interaction of their power relationships; the substance and manner of determination of "web of rules" governing the rights and obligations of the parties, and the resolution of conflicts. Mr. Hutchinson, Mr. Myers

**256. Technological Bases of Jobs and Organizations.**

Prerequisite: consent of the instructor. Technological determinants of operating systems and jobs; productive system design models; behavioral models underlying operating system design; technology and social system design; operating system variability, control and measurement. Mr. Davis, Mr. Kleingartner

**257. Labor Relations, Law and Industrial Organization.**

Given every third year. Prerequisite: course 251, 252, or 253 or consent of the instructor. An examination at an advanced level of the legal, managerial and economic factors relevant to union-management relations. Investigation in depth of specific labor relations problems from the point of view, simultaneously, of law, management and economics. Mr. Meyers

**258. Selected Topics in Industrial Relations.**

(Formerly numbered 259.) Prerequisite: open primarily to Ph.D. candidates, but also to others with consent of the instructor. An examination in depth, of problems or issues of current concern in industrial relations. Emphasis on recent contributions to theory, research, and methodology of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit. The Staff

**MARKETING****260A. Marketing Management Theory.**

Prerequisite: B.S. in business administration or courses 401, 407, 120M, and 411 or equivalent, or consent of the instructor. An analysis of marketing management concepts developed from economic, sociological, psychological and organization theory. These concepts will be applied in a comprehensive view of the more difficult problems arising in product, price, channel, and promotion policy and decision-making. Mr. Garrison

**261A. Marketing Institutions: Retail.**

Prerequisite: course 260A or consent of the instructor. A study of special issues associated with the retail sector of the distribution process. Includes a discussion of the importance and impact of current research studies on retailing efficiency. Individual projects and reports. Mr. Brown

**261B. International Marketing Management.**

Prerequisite: course 260A, Economics 190 or consent of the instructor. Opportunities, distinctive characteristics, and emerging trends in foreign markets are analyzed. Including an exploration of alternative methods and strategies, organizational planning and control, impact of social, cultural, economic, and political differences, and problems of adapting American marketing concepts and methods.

Mr. Yoshino

**262. Price Policies.**

Prerequisite: course 260A or consent of the instructor. Consideration of such concepts as product classification, demand, competition, and costs, as they apply to price-making. The theory of price leadership, geographical pricing, price discrimination, price warfare, and leader pricing are also studied in relation to the price-making process. In addition, some attention is given to the price policies of individual firms in which these concepts are applicable.

Mr. Brown, Mr. Garrison

**263A. Consumer Behavior.**

Prerequisite: courses 180, 115A and 160 or equivalent, or consent of the instructor. A study of the nature and determinants of consumer behavior. Attention will be focused on the influence of socio-psychological factors such as personality, small groups, demographic variables, social class, and culture on the formation of consumers' attitudes, consumption and purchasing behavior.

Mr. Cooper, Mr. Kassarian

**263B. Theory of Marketing Stimulation.**

Prerequisite: course 263A. Analysis of factors influencing consumer demand. Techniques for stimulating demand are evaluated in relation to specific marketing objectives. Material is drawn from economics, psychology, sociology, anthropology, and marketing research.

Mr. Kassarian

**264A. Techniques of Marketing Measurement.**

Prerequisite: courses 115A, 160 or consent of the instructor. Methods of measuring and predicting the forces affecting marketing, including quantitative aspects of demand, consumer reaction to product characteristics, effectiveness of advertising and other promotional devices, influence of rewards and organizational systems on sales efficiency, and effectiveness of competitors' strategies.

Mr. Cooper, Mr. Kassarian, Mr. Nakanishi

**264B. Mathematical Models in Marketing.**

Prerequisite: course 260A, or equivalent or consent of the instructor. A study of the utilization of models for the solution of marketing problems. Discussion will be focused on models concerned with such problems as brand switching, media selection, pricing, competitive strategy, scheduling, allocation problems, and waiting time.

Mr. Bettman, Mr. Jones

**265A. Marketing and the Law.**

Prerequisite: course 260A, completion of screening examination for doctoral candidates, or consent of the instructor. A detailed study of the legislative enactments (federal, state, or local) which influence the operation of institutions engaged in marketing activities, together with an analysis of the judicial decisions which have interpreted these laws.

Mr. Brown

**266A. Product and Channel Policies.**

Prerequisite: course 260A. A study of the influence of technique and marketing variables on the adaptation of product design to market requirements and on the selection of channels of distribution.

Mr. Brown

**266B. Advertising Policy.**

Prerequisite: courses 260A, 263A, or consent of the instructor. A study of the formulation of advertising policies, involving an analysis of cases dealing with: the role of advertising in marketing, the definition of advertising objectives, strategy, appropriation policy, media selection, evaluating advertising results, and the organization of the advertising function.

Mr. Garrison

**268. Selected Topics in Marketing.**

( $\frac{1}{4}$  to  $1\frac{1}{2}$  courses)

(Formerly numbered 269.) Prerequisite: course 260A and final semester standing for M.S. degree candidates, passage of screening examinations for Ph.D. degree candidates, or consent of the instructor. A study of selected areas of marketing knowledge and thought. Specific subjects discussed to be changed each semester depending on the particular interests of the instructor and students. Individual projects and reports. May be repeated for credit.

The Staff

**TRANSPORTATION****270. Physical Distribution Management.**

Prerequisite: Economics 175 or consent of the instructor. Advanced analysis of spatial problems of firms, including transportation problems of physical distribution.

Mr. Quinn

**271. Transportation Management.**

Prerequisite: Economics 175 or consent of the instructor. Application, through individual research, analysis, and group discussion of management principles and techniques applicable to transportation enterprises.

Mr. Quinn

**URBAN LAND ECONOMICS****275. The Urban Environment and Business.**

Prerequisite: consent of the instructor. Extent of urbanization in the U. S., forces causing urbanization, impact of urbanization on land uses, patterns of residential, industrial, and commercial development, management impact on city growth and structure impact on management, government and urbanization.

Mr. Burns, Mr. Case, Mr. Ratajczak

**276A. Theory and Methods of Urban Space Allocations.**

Prerequisite: courses 175, 401, or equivalent or consent of the instructor. Systematic analysis of determinants of real property values and allocation of land uses over urban space. Emphasis given to the role of entrepreneurial decisions in shaping the urban land use structure within the context of public powers and policies.

Mr. Case, Mr. Granfield, Mr. Rabin

**276B. Urban Land Economics.**

Prerequisite: courses 175, 401, or consent of the instructor. Public and private forces affecting urban change. Emphasis on the role of the public sector and tools for analyzing policy alternatives for metropolitan growth and development.

Mr. Burns, Mr. Case, Mr. Rabin

**277. Real Estate Finance.**

(Numbered 277A-277B in 1966-67.) Prerequisite: course 175 or consent of the instructor. The market for real estate funds as part of the capital market. Instruments of equity and mortgage investment. The major mortgage lenders. Competitive market structure. Government policies. Investment analysis for equity and loan investments.

Mr. Case, Mr. Granfield, Mr. Ricks

**278A. Housing Economics.**

Prerequisite: courses 175, 278B, or consent of the instructor. Consideration of determinants of private and public demand for housing. Housing programs and relationships between construction and economic trends are examined in detail.

Mr. Burns, Mr. Case, Mr. Rabin

**278B. Housing Policy.**

Prerequisite: courses 175, 278A, or consent of the instructor. U. S. and foreign housing programs. Housing low income groups, new town legislation, improving environment—urban renewal and development and related topics. Criteria for assessing public policy, policy implementation, policy and stages of national economic development, the role of private enterprise.

Mr. Burns, Mr. Case

**279A. Comparative and International Urban Land Studies.**

Prerequisite: course 175 or Economics 120 or consent of the instructor. Analysis of private and public decision making shaping urban development and redevelopment in selected countries. Emphasis on the economic, social and institutional factors which determine urban growth, structure, and patterns on the land in developed and underdeveloped nations.

Mr. Burns, Mr. Case, Mr. Mittelbach

**279B. Studies in Urban Land Economics.**

Prerequisite: post-screening examination status in urban land economics. An examination in depth of problems or issues of current concern in urban land economics. Emphasis on recent contributions to theory, research, and methodology of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

The Staff

**279X-279Y-279Z. Urban Research and Development—Compton. (½ course each)**

Prerequisite: consent of the instructor and graduate status. Exploration of urbania and its problem; prospects and prescriptions for the delivery of a quality life. The exploration will be both macroscopic and microscopic as related to the problems of Compton, California

The Interdisciplinary Staff

**BEHAVIORAL SCIENCE****280A-280B-280C. Foundations in Managerial Behavioral Science. (2 courses each)**

Prerequisite: successful completion of Ph.D. screening examinations. Credit and grade given upon completion of the full sequence. An integrated and interdisciplinary study of behavioral science for management. Content areas include the person, dyad, group, intergroup, organization and society. Processes of concept formation, change, and research are examined for these human units and their interrelationships.

The Staff

**280D. Behavioral Science Research Seminar.**

Prerequisite: enrollment in the Behavioral Science Ph.D. program and completion of the 280A-280B-280C sequence. Survey of behavioral science research methodologies. Seminar reports and class critique of course members' dissertation research and methodology. May be repeated for credit.

Mrs. Lasko

**281. Behavioral Foundations of Socio-Technical Systems.**

(Formerly numbered 281A.) Prerequisite: consent of the instructor. Study of task groups, intergroup relations, and organizations in context of socio-technical systems. Structure and dynamics of these social units in relation to their physical/technical environment. Emphasis on the design of technologies and formal structures to enhance the emergence of viable social structures. Consideration of the impact of technological change on social relations.

Mr. Vaill

**282A. Direction and Leadership.**

(Formerly numbered 292.) The management function of direction and its implementation through leadership. Emphasis on research and theories dealing with the key variables underlying the manager's interpersonal effectiveness in an organizational context.

Mr. Peters, Mr. Thomas

**282B. Leadership Training: Theory and Practice.**

(Formerly numbered 256.) Problems in the application of scientific knowledge for the development of effective leaders. Comparative analysis of the research findings, theories, and practices of different approaches to leadership training. Critical analysis of the role of the training specialist.

Mr. Clark, Mr. Peters, Mr. Shedlin

**283. Organizational Change Processes.**

(Formerly numbered 206A-206B.) Prerequisite: courses 180, 404 or consent of the instructor. Analysis of research, theory and practice relevant to behavioral change processes at many social levels to illuminate these processes in an organizational setting. Concepts and methods will be examined and tested by laboratory and field experiences.

Mr. Goodman, Mr. Tammenbaum

**285. Advanced Behavioral Science.**

(Formerly numbered 207.) Prerequisite: consent of the instructor. Focuses on advanced theory, integration and application of knowledge concerning individual, group, organizational, subcultural and cultural behavior. The student explores in depth selected theoretic positions, extending and consolidating behavioral science knowledge and its application to specialized business administration fields.

Mr. Massarik

**286. Field Studies in Socio-Technical Systems.**

Prerequisite: consent of the instructor. Basic concepts, principles and methodologies of socio-technical analysis applied to operational problems of organizations. Emphasis will be on the conduct of empirical studies.

The Socio-Technical Staff

**288. Special Topics in Behavioral Science.**

Prerequisite: open primarily to Ph.D. candidates, but also to others with consent of the instructor. An examination, in depth, of problems or issues of current concern in behavioral science. Emphasis on recent contributions to theory, research and method-



ology of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit. **The Staff**

## MANAGEMENT THEORY

### 290. Organization Theory.

Prerequisite: course 423 or consent of the instructor. Analysis of the theory and practice of the managerial function of organizing through study of the literature, case analyses, and seminar discussion. Individual projects and reports.

Mr. Koontz, Mr. McKelvey, Mr. Sedgwick

### 291. Planning and Control.

Prerequisite: course 423 or consent of the instructor. Analysis of the theory and practice of the managerial function of planning and control. The implementation of objectives through policy formulation, decision-making, and control. Individual projects and reports.

Mr. Carrabino, Mr. Schollhammer, Mr. Steiner

### 292A. Environmental Settings of Socio-Technical Systems.

Prerequisite: consent of the instructor. Complexity, interdependence and uncertainty of organizational environments. Analysis of environments along socio-cultural, political and economic dimensions, their interrelationships and relations to technology. Organizational responses to various environments.

**The Staff**

### 292B. Models of Organizational Behavior.

Prerequisite: consent of the instructor. Theoretical frameworks for developing explanatory and predictive models of complex organizations. Exercises in constructing formal models, usually in mathematical or stochastic form, and where appropriate, using materials from field studies to develop empirical tests. These models may be used to discover implications for the systems changes recommended in the socio-technical field study.

Mr. McWhimney

### 293. The Philosophy of Enterprise Control.

Prerequisite: courses 190A-190B or 409 or consent of the instructor. A study of the business enterprise as a social institution, with emphasis on the changing purposes of social action. Adjustments of the firm to changes in the social environment. Ethical problems in management. Social responsibilities of the business manager.

Mr. Steiner

### 294A-294B. Business Policies.

Prerequisite: courses 190A-190B or 409, or consent of the instructor. Analyses of business cases; the identification of salient problems encountered by managers at all levels, and the application of management principles to their identification and solution.

Mr. Carrabino, Mr. Mason

### 295. The History of the Businessman.

Prerequisite: courses 190A-190B. The functions and methods of businessmen as they were shaped by the social environment of selected historical periods. Special attention is given to the institutions which were developed to facilitate or regulate business activity.

**The Staff**

### 296. International Business Management.

Prerequisite: course 205A or consent of the instructor. Identification, analysis, and resolution of managerial issues of policy and action within the

context of an international corporation, with emphasis on problems of adaptation to different sociological, cultural, legal, political, and economic environmental characteristics.

Mr. R. H. Mason, Mr. Schollhammer, Mr. Yoshino

### 297A. Comparative and International Management.

Prerequisite: courses 190A-190B or 409. A comparative study of the practice of management in selected foreign countries, as affected by their social environments and the development of management theory.

Mr. Richman, Mr. Schollhammer, Mr. Yoshino

### 297B. International Business Policy.

Prerequisite: course 205A and consent of the instructor. Analysis of key managerial problems encountered in a multinational corporation. Concepts and theories acquired in other courses in International Business and Comparative Management will be applied to a series of complex cases and simulations of international business operations.

Mr. Schollhammer, Mr. Richman, Mr. Yoshino

### 298A. Special Topics in Management Theory.

Prerequisite: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in management theory. Emphasis on recent contribution to theory, research, and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

**The Staff**

### 298B. Special Topics in International and Comparative Management.

Prerequisite: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in international and comparative management. Emphasis on recent contributions to theory, research, and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

**The Staff**

### 298C. Special Topics in Socio-Technical Systems.

Prerequisite: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in socio-technical systems. Emphasis on recent contributions to theory, research, and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

**The Staff**

### 298D. Special Topics in Business Administration.

Prerequisite: open primarily to Ph.D. candidates or with consent of the instructor. An examination in depth of problems or issues of current concern in Business Administration. Emphasis on recent contributions to theory, research, and methodology. Of special interest to advanced doctoral candidates, the academic staff, or distinguished visiting faculty. May be repeated for credit.

**The Staff**

## INTERNATIONAL AND COMPARATIVE MANAGEMENT STUDIES

See courses 205A, 205B, 205C, 226, 233A, 255, 261B, 296, 297A, 297B, 298B.

**OPERATIONS RESEARCH PROGRAM**

See courses 111, 203A, 203B, 203C, 210A, 210B, 210C, 211A, 211B, 214C, 214D, 216A, 216B, 217B, 218A, 218D, 240A, 240B, 240C, 240D, 243B, 243C.

**SOCIO-TECHNICAL SYSTEMS STUDIES**

See courses 240C, 240E, 242C, 256, 281, 283, 286, 292A, 292B, 298C.

**MASTER OF BUSINESS ADMINISTRATION CURRICULUM****401. Business Economics.**

(Formerly numbered 100G.) Analysis of decision-making in the firm, competitive policies and market structure, revenue and cost behavior. **The Staff**

**402. Mathematics for Management.**

(Formerly numbered 110G.) Fundamental mathematics for business, including topics from matrix algebra, probability, and calculus; with applications to model building and decision-making in business firms. **The Staff**

**403A. Survey of Financial and Managerial****Accounting.**

An introduction to fundamental systems and procedures in financial and managerial accounting, with an emphasis on income measurement, marginal analysis, standard and direct costing. **The Staff**

**403B. Survey of Financial and Managerial****Accounting: Computer Laboratory. (½ course)**

A computer laboratory comprising theory and practice in FORTRAN IV programming. **The Staff**

**404. Behavioral Science Foundations.**

(Formerly numbered 180G.) Fundamental concepts in behavioral science; their integration and application to management. Theoretical and practical aspects of organization, group, cultural and individual behavior. The managerial environment as a field for systematic behavioral science investigation. **The Staff**

**405. Business Communications.**

(Formerly numbered 109G.) Examination of communication as a social and symbolic process affecting the management function and analysis of the communication alternatives available to managers for the solution of specific problems. **The Staff**

**406. Business Fluctuations.**

(Formerly numbered 101G.) Sales, costs, and profit forecasting. General business forecasting and cyclical mechanisms. **The Staff**

**407. Business Statistics.**

(Formerly numbered 115G.) An introduction to statistics for graduate students who have had no previous course in which emphasis is upon applications to business problems. **The Staff**

**408. Business Finance.**

(Formerly numbered 130G.) Contents include business financial planning, financial management, securities and other financial instruments, securities markets, and securities valuation. **The Staff**

**409. Management Theory and Policy.**

(Formerly numbered 190G.) An analysis of the functions of managers, emphasizing underlying principles applicable to general, rather than functional management. **The Staff**

**410. Operations Management.**

(Formerly numbered 140G.) Principles and decision analysis related to the effective utilization of the factors of production in manufacturing and manufacturing activities for both intermittent and continuous systems. The study of production organizations, analytical models and methods, facilities design, and the design of control systems for production operations. **The Staff**

**411. Elements of Marketing.**

(Formerly numbered 160G.) A study of institutions and functions as they relate to the distribution of goods and services, emphasizing the viewpoint of management in the planning, execution, and measurement of marketing activities and strategies, and the viewpoint of society in the analysis of costs, impact, and results. **The Staff**

**412. Business Economics and Fluctuation.**

(Formerly numbered 102G.) Analysis of decision-making in the firm, competitive policies and market structure, revenue and cost behavior. Sales, cost, and profit forecasting. General business forecasting and cyclical mechanisms. The role of enterprise under political democracy and public policy. **The Staff**

**421. Business, Labor and Government.**

Prerequisite: Completion of first year of MBA Curriculum. Examines the nature of national policy issues which involve both organized and unorganized labor and have implications for the performance of business firms and other employing organizations. Also provides general familiarity with approaches to the problems of labor utilization within unionized and non-union firms. **The Staff**

**422. Business Economic Policies.**

Prerequisite: Completion of first year of MBA Curriculum. Major government policies affecting the economic environment of the business firm. Monetary and fiscal policies to achieve economic stability and growth. Public policies toward competition and its regulation. Social and economic rationale for regulation. Measuring competition and monopoly. **The Staff**

**423. Advanced Management Theory.**

Prerequisite: Completion of first year of MBA Curriculum. Advanced study of management theory in formally organized enterprise through significant readings; discussing advanced approaches and techniques developed from applying theory; using theory to integrate methods and findings of quantitative and behavioral sciences; lectures on sophisticated application of management theory in practice. **The Staff**

**424. Business and Society.**

Prerequisite: Completion of first year of MBA Curriculum. Study of the broad evolving interrelationships between business and society, the changing role of the businessman in his environment, the ethical problems and social responsibilities of business managers, and the business enterprise as a social institution. **The Staff**

**425A-425B. Business Policy.**

**Prerequisite:** Completion of first year of MBA Curriculum. Case course dealing with basic policy decisions, executive action, and administrative behavior involved in managing total enterprises. The student is confronted with single company situations to develop ideas essential to overall managerial direction. The Staff

**Professional Courses****450. Field Work in Behavioral Science Management Development.**

**Prerequisite:** course 282B and consent of the instructor. Supervised practical work in all phases of laboratory education for management development, such as sensitivity training laboratories, creativity and personal growth laboratories, simulated managerial behavior laboratories, etc. The Staff

**451. Field Work in Organizational Development.**

**Prerequisites:** courses 282B, 283 and/or consent of the instructor. Supervised practical field work in organizational development consultation in inter-personal, group, intergroup, total organization and interorganizational settings. The Staff

**■ BUSINESS EDUCATION**

(Department Office, 244 Moore Hall)

Lawrence W. Erickson, Ed.D., *Professor of Education.*

Samuel J. Wanous, Ph.D., *Professor of Education.*

Marilyn Kourilsky, Ph.D., *Assistant Professor of Education.*

Students wishing to prepare for teaching in the field of business education should plan to complete the business-economics major shown below:

**Business-Economics Major for Business Teachers**

This major has been designed in accordance with the State law governing the Standard Teaching Credential with a Specialization in Secondary Teaching for business teachers. The program, offered by the Department of Economics, consists of a departmental major in economics and business administration. This combination major also satisfies the teaching credential minor requirement. A fifth year is necessary for the completion of the credential requirements.

**Lower Division Requirements.** (1) Language: five courses in one or two languages (or their equivalent); (2) Mathematics: Mathematics 1 (if less than three years of high school mathematics); (3) English and Speech: English 1 (or proficiency examination—in addition to Subject A examination) and Speech 1; (4) American History and Institutions: Economics 10 or approved alternative; (5) Physical Sciences: Physical Sci-

**Individual Study and Research****596A-596N. Research in Business Administration.**

( $\frac{1}{4}$  to 2 courses)

**Prerequisite:** consent of Director of Master's Programs or Director of Doctoral Program by special petition. Directed individual study or research. The Staff

**597. Preparation for Examinations in Business**

**Administration. (1 or 2 courses)**

**Prerequisite:** consent of Director of Master's Programs or Director of Doctoral Program by special petition. Preparation for comprehensive examination for the master's degree or the qualifying examination for the Ph.D. degree. The Staff

**598. Thesis Research in Business Administration.**

(1 or 2 courses)

**Prerequisite:** consent of Director of Master's Program by special petition. Research for and preparation of the master's thesis. The Staff

**599. Dissertation Research in Business**

**Administration. (1 or 2 courses)**

**Prerequisite:** consent of Director of Doctoral Program by special petition. Research for and preparation of the doctoral dissertation. The Staff

ences 1, 2, Mathematics 2B or 3A or 11A; (6) Life Sciences: Biology 2; one course from Anthropology 11, Bacteriology 6, Biology 21, Botany 10, Geography 5, Geology 115, or Psychology 12 or 115; Psychology 10; Humanities and Electives: three courses from Humanities 10, 1B or English 10A, 10B, 10C or English 100, 101, 102, 103, 104, 110, 113A; 115, 116, 117. One additional course from art, history, literature, music, or philosophy.

**Lower Division Requirements for Major.** Economics 1, 2, Business Administration 1A, 1B.

**Upper Division Requirements.** (1) Economics 101A, 101B, 102, 160; three courses from Economics 107, 130, 150, 170, 180, 190; (2) Business Administration 108, 109, 113A; 115A or Economics 140; Business Administration 120, 130; three courses from Business Administration 113B, 122, 135, 160, 180, 190A.

**Credential Requirements.** Applicant must complete a minimum of 36 quarter units (nine courses) beyond the bachelor's degree. The three student-teaching courses and any

Education courses not completed during the fourth year may be included. In addition, course work may be taken toward the M.A. or M.Ed. in Education, M.A. in Economics, M.B.A. or M.S. in Business Administration. (1) Fourth or Fifth Year Courses: Education 100 or 108, 112, 130, 137A; 137B or 137C; (2) Fifth Year Courses: two courses in 200 or 400 series in major; student teaching: Education 330A, 330B, 330C; or internship.

#### Graduate Division

Students in business education may earn the following graduate degrees: Master of Business Administration or Doctor of Philosophy in the School of Business Administration; Master of Education, Master of Arts, Doctor of Education or Doctor of Philosophy in the Graduate School of Education. For further information see the ANNOUNCEMENT OF THE GRADUATE SCHOOL OF BUSINESS ADMINISTRATION, THE ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION, and the announcement of the Graduate Division, GRADUATE STUDY AT UCLA.†

#### Requirements for Teaching Credentials

Candidates for the teaching credentials with a major or minor in business education should consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.‡

##### Upper Division Course

#### 199. Special Studies. (¼ to 1 course)

Prerequisites: senior standing and consent of the instructor. The Staff

##### Professional Course

#### 410. Case Studies in Office Management.

Mr. Erickson

##### Individual Study and Research

#### 596. Independent Study in Business Education.

(½ to 1 course)

The Staff

##### Related Courses in Other Departments

Education 137A. The Curriculum in Business Education. Mr. Erickson

137B. The Teaching of Secretarial Subjects. Mr. Erickson

137C. The Teaching of Bookkeeping, General Business, and Economics. Mr. Erickson

## ■ CHEMISTRY

(Department Office, 3010 Chemistry Building)

†Frank A. L. Anet, Ph.D., *Professor of Chemistry.*

Daniel E. Atkinson, Ph.D., *Professor of Chemistry.*

\*Paul D. Boyer, Ph.D., *Professor of Chemistry.*

Donald J. Cram, Ph.D., *Professor of Chemistry.*

Mostafa A. El-Sayed, Ph.D., *Professor of Chemistry.*

Paul S. Farrington, Ph.D., *Professor of Chemistry.*

Christopher S. Foote, Ph.D., *Professor of Chemistry.*

\*Clifford S. Garner, Ph.D., *Professor of Chemistry.*

Theodore A. Geissman, Ph.D., *Professor of Chemistry.*

E. Russell Hardwick, Ph.D., *Professor of Chemistry.*

\*M. Frederick Hawthorne, Ph.D., *Professor of Chemistry.*

Thomas L. Jacobs, Ph.D., *Professor of Chemistry.*

Herbert D. Kaesz, Ph.D., *Professor of Chemistry.*

Daniel Kivelson, Ph.D., *Professor of Chemistry.*

\*\*Willard F. Libby, Ph.D., D.Sc., *Professor of Chemistry.*

James D. McCullough, Ph.D., *Professor of Chemistry.*

William G. McMillan, Jr., Ph.D., *Professor of Chemistry.*

Robert L. Pecsok, Ph.D., *Professor of Chemistry.*

Howard Reiss, Ph.D., *Professor of Chemistry.*

Verne N. Schumaker, Ph.D., *Professor of Molecular Biology in Chemistry.*

Robert L. Scott, Ph.D., *Professor of Chemistry (Chairman of the Department).*

† Absent on leave, 1970-1971.

‡ For further information, see Professor Erickson or Professor Wanous.

\*\* Member of the Institute of Geophysics and Planetary Physics.

\* In residence spring quarter only, 1971.

\* Absent on leave, spring quarter, 1971.

\*Roberts A. Smith, Ph.D., *Professor of Chemistry.*

Kenneth N. Trueblood, Ph.D., *Professor of Chemistry.*

Charles A. West, Ph.D., *Professor of Chemistry (Vice-Chairman of the Department).*

Francis E. Blacet, Ph.D., D.Sc., *Emeritus Professor of Chemistry.*

Max S. Dunn, Ph.D., LL.D., *Emeritus Professor of Chemistry and Biological Chemistry.*

G. Ross Robertson, Ph.D., *Emeritus Professor of Chemistry.*

William G. Young, Ph.D., D.Sc., *Emeritus Professor of Chemistry.*

Mario E. Baur, Ph.D., *Associate Professor of Chemistry.*

Kyle D. Baves, Ph.D., *Associate Professor of Chemistry.*

\*\*\*John T. Wasson, Ph.D., *Associate Professor of Chemistry.*

Craig W. Deutsche, Ph.D., *Assistant Professor of Chemistry.*

David S. Eisenberg, Ph.D., *Assistant Professor of Chemistry.*

\*David A. Evans, Ph.D., *Assistant Professor of Chemistry.*

Edward W. Graham, Ph.D., *Assistant Professor of Chemistry.*

Andrew U. Hazi, Ph.D., *Assistant Professor of Chemistry.*

Jerome V. V. Kasper, Ph.D., *Assistant Professor of Chemistry.*

†Charles M. Knobler, Ph.D., *Assistant Professor of Chemistry.*

Michael W. Konrad, Ph.D., *Assistant Professor of Chemistry.*

David A. Lightner, Ph.D., *Assistant Professor of Chemistry.*

\*Malcolm F. Nicol, Ph.D., *Assistant Professor of Chemistry.*



\*\*George C. Kennedy, Ph.D., *Professor of Geochemistry and Geology.*

#### Admission to Courses in Chemistry

Regular and transfer students who have the prerequisites for the various courses are not thereby assured of admission to those courses. The Department may deny admission to any course if a grade D was received in a course prerequisite to that course, or if in the opinion of the Department the student shows other evidence of inadequate preparation.

#### Preliminary Examination in Chemistry

Students who wish to enroll in course 1A or in course 1AH must take the Preliminary Examination in Chemistry during the enrollment period for the quarter in which they intend to enroll in these courses. Enrollment usually will be limited to students who have passed the examination. During 1970-1971, the Preliminary Examination in Chemistry is scheduled on September 28, 1970 for the Fall Quarter; January 4, 1971 for the Winter Quarter; and March 29, 1971 for the Spring Quarter. These dates may be changed. The time and location of the examination will be posted on the Chemistry 1A Bulletin Board located near Room 1054 in the Chemistry Building about two weeks before the announced date of the examination.

#### Preparation for the Major

Required: Chemistry 1A, 1B, 1C, 4A, 4B, 4C, 6A, 6B, 6C; Physics 7A, 7B, 7C, 7D; Mathematics 11A, 11B, 11C, and either 12A and 12B or 13A and 13B; English 1 and one other English course involving composition. No specific foreign language is required. However, a reading knowledge of German (at least at the level of German 3) is strongly recommended for students planning to pursue graduate work in Chemistry.

#### The Major

The minimum requirement for the major in chemistry consists of courses 110A, 110B, 113, 114A, 133A, 133B, and three other upper division or graduate chemistry courses including: 1) one laboratory course selected from 136, 144, 154, and 184; 2) one course in analytical chemistry, biochemistry, or inorganic chemistry selected from courses 153, 154, 173, 175, and 184; 3) one course in an area of chemistry different from that selected under 2). Courses 199A-ZZ may be used on a two-for-one basis to meet the upper division elective requirement for the major. Consent of the Undergraduate Adviser is required for each substitution. Courses 199A-ZZ may be

† Absent on leave, 1970-1971.

\*\* Member of the Institute of Geophysics and Planetary Physics.

\* In residence fall quarter only, 1970.

\* Absent on leave, Fall quarter, 1970.

substituted only for equivalent required courses, i.e. two 199 courses involving experimental research could be substituted for the laboratory course requirement, or two 199 courses in inorganic chemistry or one in inorganic and one in biochemistry could be substituted for the inorganic-biochemistry-analytical course requirement. Research in theoretical chemistry may not be substituted for laboratory work.

Chemistry majors are urged to seek help and advice in the Chemistry Undergraduate Adviser's Office, Room 1037, Chemistry Building.

### Transfer Students

An entering transfer student who has satisfactorily completed a year course in general college chemistry should enter courses 4A and 6A. However, if he has not completed the equivalent of one quarter of quantitative analysis, which is a prerequisite for course 6B, he must also enroll in course 5. If he has completed one or more semesters of quantitative analysis and one or two semesters of organic chemistry, he should enter courses 4C and 6C.

An entering transfer student who has satisfactorily completed two years of chemistry courses, including an introductory course in organic chemistry, but has not had instruction in spectroscopic methods of organic chemistry at the level of courses 6A and 6B, should take course 131. For such students, course 131 is required for admission to courses 133A, 133D, 136, and 144, although it may be taken concurrently with course 133A or 133D. Students who are unsure of which course to enter should consult the Chemistry Undergraduate Adviser.

### Graduate Study

The Department of Chemistry offers programs of study and research leading to the M.S. and Ph.D. degrees in chemistry and to the M.S. and Ph.D. degrees in biochemistry. Prospective candidates for advanced degrees in chemistry may specialize in any of the following fields: analytical chemistry, biochemistry, inorganic, organic, or physical chemistry.

The general University requirements for the M.S. degree are given on pages 153-154. The Department of Chemistry makes use of the Thesis Plan. The General University requirements for the Ph.D. degree are given on page 156. The student is not required to earn the M.S. degree before undertaking work for the Ph.D. degree. More detailed information

regarding admission to and requirements for graduate study may be obtained by writing to the Graduate Adviser, Department of Chemistry, University of California, Los Angeles, California 90024.

### Lower Division Courses

For the combination of courses 1A and 2, a total of only 1½ courses of credit will be allowed.

### 1A. General Chemistry.

Lecture and quiz, four hours; laboratory, four hours. Prerequisites: three years of high school mathematics; high school chemistry and physics are strongly recommended. All students who intend to take this course must take the Preliminary Examination in Chemistry which will normally be given within about 10 days before instruction begins. Enrollment usually will be limited to those students who have passed that examination. Students appearing for the examination must be prepared to identify themselves. This course is required of all majors in chemistry and most other fields of science or technology. Knowledge of calculus will be useful for this course, but is not required. Lecture: stoichiometry and atomic theory; atomic structure and periodic table; molecular structure and chemical properties; kinetic molecular theory of gases and the gas laws; solutions and colligative properties; volumetric analysis. Laboratory: use of the balance; stoichiometry; molecular and equivalent weights; use of volumetric equipment; precise gravimetric analysis. The Staff in Freshman Chemistry

### 1AH. General Chemistry—Honors Sequence.

Lecture and quiz, four hours; laboratory, four hours. Prerequisites: An outstanding high school record in either chemistry or physics, and in at least three years of high school mathematics. Mathematics 11A should be taken concurrently. All students who intend to take this course must take the Preliminary Examination in Chemistry which will normally be given within about 10 days before instruction begins. Enrollment in this course will be open only to students who have passed that examination. An honors course parallel to course 1A. Mr. Kivelson

### 1B. General Chemistry.

Lecture and quiz, four hours; laboratory, four hours. Prerequisite: course 1A or 1AH with the grade C or higher, or all the prerequisites for course 1A and satisfactory performance on a special examination, or consent of the instructor. Lecture: solutions; chemical and phase equilibria; thermochemistry and thermodynamics. Laboratory: precise volumetric analysis; thermochemistry; solution equilibria. The Staff in Freshman Chemistry

### 1BH. General Chemistry—Honors Sequence.

Lecture and quiz, four hours; laboratory, four hours. Prerequisite: course 1AH with the grade C or higher, or course 1A and consent of the instructor. An honors course parallel to course 1B. Mr. Kivelson

### 1C. General Chemistry.

Lecture and quiz, four hours; laboratory, four hours. Prerequisite: course 1B or 1BH with the grade C or higher, or consent of the instructor. Lecture: redox systems; electrochemistry; chemical kinetics;

nuclear chemistry; systematic descriptive chemistry. Laboratory: qualitative analysis; rate experiments; quantitative electrochemical determinations.

The Staff in Freshman Chemistry

### 1CN. General Chemistry—Honors Sequence.

Lecture and quiz, four hours; laboratory, four hours. Prerequisite: course 1BH with the grade C or higher, or course 1B and consent of the instructor. An honors course parallel to course 1C. Mr. Libby

### 1N. General Chemistry for the Prenursing Curriculum.

Lecture and quiz, four hours; laboratory, four hours. Prerequisite: course 1A. A terminal course in chemistry for students in the pre-nursing, prephysical therapy, and pre-dental hygiene curricula, which emphasizes the principles of chemistry including quantitative solution techniques and brief introductions to organic chemistry and biochemistry.

### 2. Introductory Chemistry.

(Same as Physical Sciences 2.) Lecture and quiz, four hours. This course is designed to meet part of the College of Letters and Science requirements for non-science majors and similar requirements in other colleges. The course deals with the concept of the submicroscopic world of chemistry, and ranges from protons to proteins in subject matter. This course is not open to students who have received credit for Chemistry 1A. Mr. Hardwick, Mr. Kaesz

### 4A. Elementary Organic and Biochemistry. (½ course)

Lecture and quiz, two hours. Prerequisite: course 1C with the grade C or higher, or consent of the instructor. Students enrolled in course 4A must be enrolled concurrently in course 6A unless they have passed course 6A previously or have had another course beyond the freshman level which involved laboratory work in organic chemistry. All transfer students (from junior colleges and four-year colleges) and others who wish to take course 4A without 6A should discuss this with the instructor in course 4A, but this need not be done prior to registration. Organic structure; the functional and hydrocarbon groups; compounds with saturated functional groups; compounds with unsaturated functional groups; reactions. Mr. Geissman, Mr. Jacobs

### 4B. Elementary Organic and Biochemistry. (½ course)

Lecture and quiz, two hours. Prerequisite: courses 4A and 6A with grades C or higher, or consent of the instructor. Students enrolled in course 4B must be enrolled concurrently in course 6B unless they have passed course 6B previously or have had an equivalent course which involved laboratory work in organic chemistry. Transfer students and others who have not taken course 6A at UCLA and wish to take course 4B without course 6B should discuss this with the instructor in course 4B, but this need not be done prior to registration. Stereochemistry; structure and reactivity; substitution, addition, and elimination reactions; synthesis; special topics. Mr. Geissman, Mr. Lightner

### 4C. Elementary Organic and Biochemistry. (½ course)

Lecture and quiz, two hours. Prerequisite: courses 4B and 6B with grades C or higher, or consent of the instructor. Students enrolled in course 4C must

be enrolled concurrently in course 6C unless they have passed course 6C previously or have had an equivalent course which involved laboratory work in biochemistry. Transfer students and others who wish to take course 4C without 6C should discuss this with the instructor of course 4C, but this need not be done prior to registration. Enzymes, amino acids, peptides and proteins; nucleic acids and nucleotides; RNA, DNA, and genetic code; metabolism; glycolysis and citric acid cycle; carbon trans-formation. Mr. Atkinson, Mr. Konrad, Mr. West

### 5. Quantitative Analysis. (½ course)

Lecture, two hours; laboratory, four hours. Prerequisite: one year of college chemistry involving laboratory work. This course is intended for transfer students and others who have not had at least 40 hours of laboratory instruction in quantitative analysis (this is now included in courses 1B and 1C at UCLA); for such students course 5 is required for admission to course 6B. Course 5 is not open to students who have completed courses 1A, 1B, and 1C at UCLA with grades C or higher. Principles and techniques of gravimetric and volumetric analysis.

### 6A. Analytical Methods of Organic and Biochemistry. (½ course)

Lecture and quiz, two hours; laboratory, four hours. Prerequisite: course 1C with the grade C or higher, or consent of the instructor. Students enrolled in course 6A must be enrolled concurrently in course 4A unless they have passed course 4A previously or have had an equivalent course in organic chemistry beyond freshman level. Transfer students and others who wish to take course 6A without 4A should discuss this with the instructor of course 6A, but this need not be done prior to registration. Students are warned that enrollment in course 6A is often limited in the Fall Quarter by the laboratory spaces available; the Winter and Spring Quarters have been far less crowded. Where possible, students should plan to take courses 4A and 6A in these less crowded quarters. Phase equilibria; chromatography; spectra; structure determinations. Mr. Evans, Mr. Foote, Mr. Lightner

### 6B. Analytical Methods of Organic and Biochemistry. (½ course)

Lecture and quiz, two hours; laboratory, four hours. Prerequisites: course 1C or 5 taken at UCLA or 40 hours of laboratory instruction in quantitative analysis; courses 4A and 6A with grades C or higher, or consent of the instructor. Students enrolled in course 6B must be enrolled concurrently in course 4B unless they have passed course 4B previously or have had an equivalent course in organic chemistry. Transfer students and others who wish to take course 6B without 4B should discuss this with the instructor of course 6B, but this need not be done prior to registration. Polarimetry; mass spectrometry; isotopic labeling; electrochemistry; acidity; chelates; reaction kinetics. Mr. Farrington, Mr. Pecsok

### 6C. Analytical Methods of Organic and Biochemistry. (½ course)

Lecture and quiz, two hours; laboratory, four hours. Prerequisite: courses 4B and 6B with grades C or higher, or consent of the instructor. Students enrolled in course 6C must be enrolled concurrently in course 4C unless they have passed course 4C previously or have had an equivalent course in biochemistry. Transfer students and others who wish to

take course 6C without 4C should discuss this with the instructor of course 6C, but this need not be done prior to registration. Enzyme kinetics; radio-isotope applications; macromolecules; ion exchange; viscosity. Mr. Smith

#### Upper Division Courses

### 110A. Physical Chemistry: Chemical Thermodynamics.

Lecture and quiz, four hours. Prerequisite: courses 4C and 6C, Physics 7C, Mathematics 12B or 13B or, for life science majors, Mathematics 3C. Laws of thermodynamics; free energy and entropy; kinetic theory of gases; Boltzmann factor; statistical concept of entropy; heat capacities; changes of state.

The Staff in Physical Chemistry

### 110AG. Physical Chemistry: Chemical Thermodynamics.

Lecture and quiz, four hours. Open only by consent of the Chemistry Graduate Adviser to graduate students who have not taken course 110A in this institution.

The Staff in Physical Chemistry

### 110B. Physical Chemistry: Chemical Equilibrium, Electrochemistry, and Kinetics.

Lecture and quiz, four hours. Prerequisite: course 110A. Chemical and phase equilibria; solutions; colligative properties; electrochemistry; chemical kinetics.

The Staff in Physical Chemistry

### 110BG. Physical Chemistry: Chemical Equilibrium, Electrochemistry, and Kinetics.

Lecture and quiz: four hours. Open only by consent of the Chemistry Graduate Adviser to graduate students who have not taken course 110B in this institution.

The Staff in Physical Chemistry

### 113. Physical Chemistry: Introduction to Quantum Chemistry.

Lecture and quiz, four hours. Prerequisite: courses 4C and 6C, Mathematics 12B or 13B, Physics 7D. An introduction to the principles and applications of quantum chemistry; atomic structure and spectra; harmonic oscillator; rigid rotor; molecular spectra.

Mr. Baur, Mr. El-Sayed, Mr. Reiss

### 113G. Physical Chemistry: Introduction to Quantum Chemistry.

Lecture and quiz four hours. Open only by consent of the Chemistry Graduate Adviser to graduate students who have not taken course 113 at this institution.

Mr. Baur, Mr. El-Sayed, Mr. Reiss

### 114A. Physical Chemistry Laboratory.

Lecture, two hours; laboratory, eight hours. Prerequisite: courses 110A, 110B, and 113 or consent of the instructor. Lecture: techniques of physical measurement, error analysis and statistics, special topics. Laboratory: spectroscopy, thermodynamic measurements, and chemical dynamics.

The Staff in Physical Chemistry

### 115A-115B. Quantum Chemistry.

Lecture, four hours. Prerequisites: course 113; Mathematics 12C or 13C; Mathematics 130A or 130B or Physics 131, which may be taken concurrently with course 115A. Physics 105A is also recommended. Course 115A or Physics 115B is prerequisite for course 115B. Postulates and systematic

development of non-relativistic quantum mechanics; expansion theorems; wells; oscillators; angular momentum; hydrogen atom; matrix techniques; approximation methods; time dependent problems; atoms; spectroscopy; magnetic resonance; chemical bonding. Students entering course 115A will normally be expected to take course 115B the following quarter. These two courses are designed for chemistry students, primarily physical chemistry students, with a serious interest in quantum chemistry.

Mr. McMillan

### 116. Quantum Theory of Chemical Structure.

Lecture, four hours. Prerequisite: course 113. Brief review of fundamental postulates. Expansions and approximation techniques; atoms; molecular orbital and valence bond approaches; ligand field theory, molecular spectroscopy. A terminal course which emphasizes principles, limitations, and chemical applications without a detailed discussion of mathematical and quantum mechanical techniques. Not open to students who have received credit for course 115B.

Mr. El-Sayed

### 123A. Classical and Statistical Thermodynamics.

Lecture and quiz, four hours. Prerequisite: course 110B. Fundamentals of classical and statistical thermodynamics; translation, rotation, vibration, hindered rotation and excited electronic states of perfect gases; ortho-para hydrogen; heat capacities and chemical equilibria of perfect gases; electric and magnetic effects; statistical theory of reaction rates; intermolecular forces; the imperfect gas.

Mr. Baur, Mr. Reiss

### 123B. Classical and Statistical Thermodynamics.

Lecture and quiz, four hours. Prerequisite: course 123A, Mathematics 12C or 13C. Thermodynamics of phase equilibria; the solid and fluid states; non-electrolyte and electrolyte solutions; surface phenomena; high polymers; gravitation.

Mr. Baur

### 125. Computers in Chemistry.

Lecture: three hours. Prerequisite: courses 110A, 110B, 113, and a working knowledge of FORTRAN IV or PL/1. Discussion of computer techniques, including matrix manipulation, solution of differential equations, data acquisition and instrumental control, and their applications to chemical problems in quantum mechanics, thermodynamics, and kinetics.

Mr. Kasper

### 131. Spectroscopic Methods of Organic Chemistry. (½ course)

Lecture, two hours. Prerequisite: a course in elementary organic chemistry equivalent to courses 4A and 4B. Course 131 is not open to students who have completed course 6B at UCLA. This course is intended for transfer and graduate students who have not had instruction in spectroscopic methods at the level of courses 6A and 6B. For such students, this course is required for admission to courses 133A, 133D, 136, and 144, although it may be taken concurrently with courses 133A and 133D. Interpretation of infrared, ultraviolet, nuclear magnetic resonance and mass spectra in organic chemistry; introduction to other spectroscopic methods.

### 133A. Intermediate Organic Chemistry.

Lecture and quiz, three hours; laboratory, four hours. Prerequisite: courses 6A and 6B or course 131 (which may be taken concurrently) or equivalent instruction in spectroscopic methods of organic



chemistry; courses 4C and 6C. Lecture: organic reactions; synthesis; classes of compounds. Laboratory: methods of organic reactions and synthesis; techniques of product isolation. Mr. Jacobs

### 133B. Intermediate Organic Chemistry.

Lecture, three hours; laboratory, eight hours. Prerequisite: course 133A. Lecture: organic reactions and synthesis. Laboratory: methods of organic reactions, synthesis and isolation. Mr. Jacobs

### 133D. Intermediate Organic Chemistry. (½ course)

Lecture and quiz, three hours. Open only by consent of the Chemistry Graduate Adviser to graduate students who have not taken course 133A in this institution. Mr. Jacobs

### 133E. Intermediate Organic Chemistry. (½ course)

Lecture and quiz, three hours. Open only by consent of the Chemistry Graduate Adviser to graduate students who have not taken course 133B in this institution. Mr. Jacobs

### 136. Qualitative Organic Analysis.

Lecture, two hours; laboratory, eight hours. Prerequisite: courses 6A and 6B or course 131 taken at UCLA or equivalent instruction in spectroscopic methods of organic chemistry; course 133B. Identification of unknown organic compounds; separations of mixtures; derivatives; instrumental methods; micro techniques. Mr. Geissman

### 143A. Advanced Organic Chemistry.

Lecture and quiz, three hours. Prerequisite: course 133B. Gross mechanisms of organic reactions; simple molecular orbital theory; Hammett and Taft relationships; conformational analysis; reaction intermediates. Mr. Cram

### 143B. Advanced Organic Chemistry.

Lecture and quiz, three hours. Prerequisite: course 143A. Organic reactions; organic synthesis; naturally occurring compounds. Mr. Cram

### 144. Organic Synthesis.

Lecture; two hours; laboratory, eight hours. Prerequisite: courses 6A and 6B or course 131 taken at UCLA or equivalent instruction in spectroscopic methods of organic chemistry; course 133B. Methods of organic synthesis. Mr. Evans

### 153. Biochemistry.

Lecture, four hours. Prerequisite: courses 4C and 6C; 133A recommended. Survey of biochemistry, with emphasis on chemical properties associated with biological function. Mr. Atkinson, Mr. West

### 154. Biochemical Methods.

Lecture and quiz, two hours; laboratory, eight hours. Prerequisite: courses 133B, 153, or consent of the instructor. Applications of biochemical procedures to metabolic reactions; properties of living systems; enzymes; proteins; nucleic acids and other tissue constituents. Mr. Konrad

### 173. Structural Inorganic Chemistry.

Lecture and quiz, three hours. Prerequisite: courses 113, 110A (110A may be taken concurrently). Course 133B is also recommended. Selected survey of inorganic compounds: hydrides; fluorine compounds; organo-metallics; nonmetal compounds; stereochemistry; coordination chemistry of the transition metals; inorganic polymers. Mr. Keesz

### 175. Inorganic Reaction Mechanisms.

Lecture and quiz, three hours. Prerequisite: courses 110A, 110B and 113 or consent of the instructor. Survey of inorganic reactions; mechanistic principles; electronic structure of metal ions; transition-metal coordination chemistry; inner- and outer-sphere and chelate complexes; substitution, isomerization and racemization reactions; stereochemistry; oxidation-reduction, free-radical, polymerization and photochemical reactions of inorganic species. Mr. Hawthorne

### 184. Advanced Analytical Chemistry.

Lecture and quiz, two hours; laboratory, eight hours. Prerequisite: course 110A. Lecture: a survey of analytical methods, including electrochemical, separation, spectroscopic, kinetic, nuclear, and classical methods. Laboratory: gas chromatography, polarography, mass spectrometry, nuclear magnetic resonance, and other modern methods. Mr. Pecosk

### 196. Special Courses in Chemistry. (½ to 1 course)

To be arranged. Prerequisite: consent of the Chemistry Undergraduate Adviser. The Staff

### 199A–ZZ. Directed Individual Study or Research for Undergraduate Students. (½ to 2 courses)

To be arranged with individual faculty members involved. Each faculty member has a unique letter designation, which is the same for the 199 and 599 series. Prerequisite: consent of the Chairman of the Department of Chemistry. This consent must be based upon a written proposal outlining the study or research to be undertaken. The proposal should be worked out in consultation with the faculty member involved and submitted at the Chemistry Undergraduate Adviser's Office before the end of the first week of the term. At the close of each term, a report describing the student's program of study or research and signed by the student and supervising faculty member must be submitted to the Chemistry Undergraduate Adviser, who should be consulted concerning the format of the report and deadlines for submission. A student may take only one 199 course in chemistry on a letter grade basis; any additional 199 courses in chemistry may be taken only on a passed/not passed basis. With the consent of the Chemistry Undergraduate Adviser, two 199 courses may be used to fulfill one of the three upper division chemistry elective course requirements for the chemistry major. The Staff

### Graduate Courses

### 213. Advanced Quantum Chemistry.

Lecture: four hours. Prerequisite: course 115B, Physics 131. Topics in quantum chemistry selected from molecular structure, collision processes, theory of solids, symmetry and its applications, and theory of electromagnetic radiation. Mr. Hazi

### 215. Molecular Spectra, Diffraction and Structure.

Lecture and quiz, four hours. Prerequisite: course 115B, Physics 131. Selected topics from electronic spectra of atoms and molecules; vibrational, rotational and Raman spectra; magnetic resonance spectra; x-ray, neutron and electron diffraction; coherence effects. Mr. Kasper

### 218. Physical-Inorganic Chemistry Student Seminar. (½ course)

Each student enrolled presents at least one seminar on a timely and significant topic outside of his

immediate research speciality. Required of all graduate students doing research in physical or inorganic chemistry, ordinarily during the second year of graduate study.

The Staff in Physical and Inorganic Chemistry

### 221A–221F. Advanced Topics in Physical Chemistry. (½ course each)

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized speciality in physical chemistry, and will be taught by a staff member whose research interests embrace that speciality. The Staff in Physical Chemistry

#### \*223. Statistical Mechanics.

Lecture and quiz, four hours. Prerequisite: courses 115B, 123B, Physics 131. Fundamentals of statistical mechanics; classical equations of state; coulomb systems; phase transitions; quantum statistical mechanics; quantum corrections to the equation of state; density matrix; second quantization.

#### 225. Chemical Kinetics.

Lecture and quiz, four hours. Prerequisite: courses 115A, 123A, 123B. Theories of chemical reactions and their applications to experimental systems; general kinetic postulates; theories of elementary reactions; energy transfer processes; experimental studies. Mr. Graham

#### 226. Chemical Physics Seminar. (½ course)

Seminars will be presented by staff, outside speakers, postdoctoral fellows and graduate students. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Chemical Physics

### 231A–231F. Advanced Topics in Organic Chemistry. (½ course each)

Prerequisite: consent of the instructor. Each course will encompass a recognized speciality in organic chemistry, and will be taught by a staff member whose research interests embrace that speciality.

The Staff in Organic Chemistry

#### 233A. Physical Organic Chemistry. (½ course)

Lecture, two hours. Prerequisite: course 143A. Kinetics and mechanisms of organic reactions; linear free energy relationships; correlations between structure, equilibria and reactivity. Mr. Lightner

#### \*233B. Physical Organic Chemistry. (½ course)

Lecture, two hours. Prerequisite: course 233A. Approaches to organic reaction mechanisms; criteria of mechanism; nuclear magnetic resonance; stereochemistry.

#### 238. Organic Chemistry Student Seminar. (½ course)

Each student enrolled presents at least one seminar on a timely and significant topic outside of his immediate research speciality. Each student carrying out research in organic chemistry enrolls in this course, usually in his second year of graduate work.

The Staff in Organic Chemistry

#### 247. Physical Organic Seminar. (½ course each)

Seminars will be presented by staff, outside speakers, postdoctoral fellows and graduate students. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

Mr. Anet, Mr. Cram, Mr. Foote

\* Not to be given, 1970–1971.

#### 248. Natural Products Seminar. (½ course each)

Seminars will be presented by staff, outside speakers, postdoctoral fellows and graduate students. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

Mr. Evans, Mr. Geissman

#### 253. Proteins and Nucleic Acids.

(Same as Biological Chemistry 253.) Lecture and quiz, four hours. Prerequisite: courses 110A, 110B, and course 153 or Biological Chemistry 101B. Chemical and physical properties of proteins, amino acids, nucleotides and nucleic acids; structure and sequence determination; correlation of structure and biological properties; synthesis and properties of polypeptides and polynucleotides.

The Staff in Biochemistry and Biological Chemistry

#### 254. Advanced Biochemical Methods.

Lecture and quiz, two hours; laboratory, eight hours. Prerequisite: course 153 or consent of the instructor. Theoretical and practical basis of metabolic, chromatographic, kinetic, electrophoretic, ultracentrifugal, isotopic and other techniques as applied to biochemical systems. Mr. Eisenberg, Mr. Schumaker

#### 255. Biological Catalysis.

(Same as Biological Chemistry 255.) Lecture and quiz, four hours. Prerequisite: courses 110A, 110B, 143A, and course 153 or Biological Chemistry 101B. Discussion of approaches to the understanding of different enzymes and enzymic catalysis; characteristics of different enzymes and enzymic reactions of special biological processes. Mr. Boyer

#### 257. Physical Chemistry of Biological Macromolecules. (½ course)

(Same as Biological Chemistry 257.) Lecture, two hours. Prerequisite: Chemistry 110A or consent of the instructor. Theory of hydrodynamic, thermodynamic, optical and x-ray techniques used to study the structure and function of biological macromolecules.

Mr. Schumaker

#### 258. Biochemistry Student Seminar. (½ course)

Each student enrolled conducts or participates in discussions on assigned topics.

The Staff in Biochemistry

#### 261A–261F. Advanced Topics in Biochemistry. (½ course each)

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized speciality in biochemistry, and will be taught by a staff member whose research interests embrace that speciality.

The Staff in Biochemistry

#### 263. Cellular Metabolism.

(Same as Biological Chemistry 263.) Lecture, three hours. Prerequisites: course 110A or equivalent; course 153 or Biological Chemistry 101B. Patterns of biological degradation and synthesis; metabolic interrelationships and control; energetics of metabolism.

Mr. Atkinson, Mr. West and the Staff in Biological Chemistry

#### 267. Nucleic Acid and Protein Biosynthesis.

(½ course)

(Same as Biological Chemistry 267.) Lecture, two hours. Prerequisites: course 110A or equivalent; course 153 or Biological Chemistry 101B. Mechanisms in nucleic acid and protein biosynthesis; molecular genetics.

The Staff in Biochemistry

**268. Biochemistry Research Seminar. (½ course)**

Seminars will be presented by staff, outside speakers, postdoctoral fellows and graduate students. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Biochemistry

**271A-271F. Advanced Topics in Inorganic Chemistry. (½ course each)**

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized specialty in inorganic chemistry, and will be taught by a staff member whose research interests embrace that specialty. The Staff in Inorganic Chemistry

**\*273. Nuclear Chemistry.**

Lecture and quiz, four hours. Prerequisite: consent of the instructor. Radioactivity; nuclear reactions; interactions of nuclear radiation with matter; nuclear detection methods; preparation, isolation and identification of radionuclides; chemical effects of nuclear transformations; isotope effects; application of isotopes in chemistry.

**281A-281F. Advanced Topics in Analytical Chemistry. (½ course each)**

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized specialty in analytical chemistry, and will be taught by a staff member whose research interests embrace that specialty. The Staff in Analytical Chemistry

**283. Analytical Separations and Electrochemistry.**

Lecture, three hours. Prerequisite: course 184. Theory, instrumentation, and current practice of analytical separation techniques and electrochemistry, including extraction, various forms of chromatography, polarography, coulometry, and pulse methods. Mr. Pecsok

**\*285. Analytical Spectroscopy.**

Lecture, three hours. Prerequisite: course 184. Theory, instrumentation, and current practice of magnetic resonance, mass, atomic absorption, and other forms of spectroscopy, with particular emphasis on qualitative and quantitative analysis, computerized data handling, and other topics of especial analytical significance.

**288. Analytical Chemistry Seminar. (½ course)**

Seminars will be presented by staff, outside speakers, postdoctoral fellows, and each graduate student enrolled in this course. Each graduate student carrying out research in analytical chemistry enrolls in this course, usually during his second year of graduate study. The Staff in Analytical Chemistry

Individual Study and Research

**596A-596ZZ. Directed Individual Study or Research. (½ to 2 courses)**

To be arranged with the member of the faculty who will direct the study or research. The member

of the faculty directing the study or research will be identified by the same two-letter code used to identify his 599 research course. Prerequisite: consent of the Chemistry Graduate Adviser. With the consent of the Chemistry Graduate Adviser, courses of directed individual study, but not research courses may be used to fulfill the departmental requirement for the Master's degree of three courses selected from courses 115A, 115B, 123A, 123B, 143A, 143B, or any graduate level course. Graded on a satisfactory/unsatisfactory basis. The Staff

**597. Preparation for the Doctoral Qualifying Examination or the Master's Comprehensive Examination. (½ to 2 courses)**

Prerequisite: consent of the Chemistry Graduate Adviser. Course 597 may not be used to fulfill any of the course requirements for the Master's or Doctor's degrees. Graded on a satisfactory/unsatisfactory basis. The Chemistry Graduate Adviser

**598A-598ZZ. Research for and Preparation of the Master's Thesis. (½ to 4 courses)**

Each member of the faculty supervises research of master's students and holds research group meetings, seminars, and discussions with the students that take his master's research course which is identified by the same two-letter code used to identify his 599 research course. Research courses in the 598A-ZZ, 598A-ZZ, and 599A-ZZ series may be used to fulfill not more than six of the nine quarter courses required for the M.S. Degree. The Staff

**599A-599ZZ. Research for and Preparation of the Doctoral Dissertation. (½ to 4 courses)**

Each member of the faculty supervises research of doctoral students and holds research group meetings, seminars, and discussion with the students that take his doctoral research course. Each faculty member has his own doctoral research course identified by a two-letter code as follows: F. A. K. Anet, 599FA; D. E. Atkinson, 599DA; M. E. Baur, 599MB; K. D. Bayes, 599KB; P. D. Boyer, 599PB; D. J. Cram, 599DC; C. W. Deutsche, 599CD; D. Eisenberg, 599SE; M. A. El-Sayed, 599ME; D. A. Evans, 599DE; P. S. Farrington, 599PF; C. S. Foote, 599CF; C. S. Garner, 599CG; T. A. Geissman, 599TG; E. W. Graham, 599EG; E. R. Hardwick, 599RH; M. F. Hawthorne, 599FH; A. U. Hazi, 599AH; T. L. Jacobs, 599TJ; H. D. Kaesz, 599HK; J. V. V. Kasper, 599JK; D. Kivelson, 599DK; C. M. Knobler, 599CK; M. W. Konrad, 599MK; W. F. Libby, 599WL; D. A. Lightner, 599DL; J. D. McCullough, 599JM; W. G. McMillan, 599WM; M. F. Nicol, 599MN; R. L. Pecsok, 599RP; J. Rebek, 599JR; H. Reiss, 599HR; V. N. Schumaker, 599VS; R. L. Scott, 599RS; R. A. Smith, 599AS; L. R. Scott, 599LS; K. N. Trueblood, 599KT; J. T. Wasson, 599JW; C. A. West, 599CW.

\* Not to be given, 1970-1971.

**■ CLASSICS**

(Department Office, 7347 Bunche Hall)

Milton V. Anastos, Ph.D., *Professor of Byzantine Greek and History.*

Paul A. Clement, Ph.D., *Professor of Classics and Classical Archaeology.*

Herbert B. Hoffleit, Ph.D., *Professor of Classics.*

Philip Levine, Ph.D., *Professor of Classics.*

Bengt T. M. Löfstedt, Ph.D., *Professor of Mediaeval Latin.*

Jaen Puhvel, Ph.D., *Professor of Indo-European Studies (Chairman of the Department).*

Albert H. Travis, Ph.D., *Professor of Classics.*

Frederick M. Carey, Ph.D., *Professor of Classics, Emeritus.*

Gregory M. Sifakis, Ph.D., *Associate Professor of Classics.*

J. Norman H. Austin, Ph.D., *Assistant Professor of Classics.*

John M. Gleason, Ph.D., *Assistant Professor of Classics.*

Steven Lattimore, Ph.D., *Assistant Professor of Classics and Classical Archaeology.*

Tadeusz Maslowski, Ph.D., *Assistant Professor of Classics.*

David W. Packard, Ph.D., *Assistant Professor of Classics.*

Evangelos B. Petrounias, Ph.D., *Assistant Professor of Ancient and Modern Greek.*



Helen F. Caldwell, M.A., *Senior Lecturer in Classics.*

Barbara E. Killian, M.A., *Lecturer in Classics.*

Frank A. Lewis, Ph.D., *Acting Assistant Professor of Classics.*

Evelyn V. Mohr, M.A., *Lecturer in Classics.*

## INDO-EUROPEAN STUDIES

(Section Office, 11359 Bunche Hall)

Marija Gimbutas, Ph.D., *Professor of European Archaeology.*

Jaen Puhvel, Ph.D., *Professor of Indo-European Studies.*

Hartmut E. F. Scharfe, Ph.D., *Professor of Indic-Studies.*

Hanns-Peter Schmidt, Ph.D., *Professor of Indo-Iranian Studies.*

Raimo A. Anttila, Ph.D., *Associate Professor of Indo-European and General Linguistics.*

Patrick K. Ford, Ph.D., *Assistant Professor of Celtic Studies.*



Marianna D. Birnbaum, Ph.D., *Lecturer in Finno-Ugric Studies.*

Inkeri A. Rank, M.A., M.Ed., B.L.S., *Lecturer in Finno-Ugric Studies.*

### Major Fields

The student may take the major in Greek, in Latin, or in the Classics (i.e., Greek and Latin). Students considering a major in the Department should consult the adviser as soon as possible in their University career, but in no case later than the point at which they are about to take upper division courses.

### Preparation for the Major

Required: Language courses, five (or an approved sequence involving accelerated courses) in Greek and five in Latin.

### The Major

**Greek.** Required: 7½ upper division language courses in Greek; three courses in the history of Graeco-Roman literature; two courses in Greek or in Roman history; three courses in one or several of the following areas: Classical archaeology, Byzantine civilization, Mediaeval Latin literature, Mediaeval history. Total required; 15½ courses.

**Latin.** Required: 7½ upper division language courses in Latin; three courses in the history of Graeco-Roman literature; two courses in Greek or in Roman history; three courses in one or several of the following areas: Classical archaeology, Byzantine civilization, Mediaeval Latin literature, Mediaeval history. Total required: 15½ courses.

**The Classics (Greek and Latin).** Required: 11 upper division language courses, 5½ in Greek, 5½ in Latin; three courses in the history of Graeco-Roman literature; two courses in Greek or in Roman history. Recommended, but not required: three courses in one or several of the following areas: Classical archaeology, Byzantine civilization, Mediaeval Latin literature, Mediaeval history. Total required: 16 courses.

### Admission to Graduate Status

A candidate for admission to graduate status in the Department must meet, in addition to the general University require-

ments, the minimum requirements for a Bachelor of Arts degree from this University, or its equivalent, with a major in Greek or in Latin or in the Classics (Greek and Latin).

#### **Special Requirements for the Secondary Teaching Credential in Latin**

Students preparing for this credential are required to take Latin 100 and Latin 370.

#### **Requirements for the Master's Degree**

The degree is offered in Greek, in Latin, and in the Classics (Greek and Latin). In order to qualify, the candidate must satisfy (1) the general University requirements, (2) the general departmental requirement, and (3) the special departmental requirements for the degree in one of the three fields. For the outline of departmental requirements, see below; for *complete* data, students must consult the department.

*General University Requirements for the Masters' Degree.* See pages 153-154. The Department follows the comprehensive examination plan.

*General Departmental Requirements.* In addition to fulfilling the general University requirements, the candidate will be expected to demonstrate a satisfactory reading knowledge of French or German by the end of his first year of residence. If he is unable to do so, he will not be permitted to take further courses in the Department until the requirement is met.

*Special Departmental Requirements for the Master of Arts Degree in Greek.* Nine courses of which at least four must be language courses in Greek and two must be language courses in Latin.

A comprehensive written examination to consist of translation from the Greek. Passages for translation into English prose will be set from Greek works presumed to be familiar as well as from those presumed to be unfamiliar to the student.

*Special Departmental Requirements for the Master of Arts Degree in Latin.* Nine courses of which at least four must be language courses in Latin and two must be language courses in Greek.

A comprehensive written examination to consist of translation from the Latin. Passages for translation into English prose will be set from Latin works presumed to be familiar as well as from those presumed to be unfamiliar to the student.

*Special Departmental Requirements for the Master of Arts Degree in the Classics.*

Nine courses of which at least three must be language courses in Greek and three must be language courses in Latin.

A comprehensive written examination to consist of translation from the Greek and from the Latin. Passages for translation into English prose will be set from Greek works and from Latin works presumed to be familiar as well as from those presumed to be unfamiliar to the student.

#### **Requirements for the Doctor's Degree**

*Admission to the Doctoral Program.* Prerequisite for admission to the program is a Bachelor of Arts degree from this University, or its equivalent, with a major in the Classics (Greek and Latin). Only those students who are judged by the Department to have achieved distinction in the earlier phases of their graduate studies will be permitted to proceed with the advanced requirements of the doctoral program.

*General Requirements.* See page 156.

*Foreign Language.* During the first year of graduate study, the student must pass the standard reading examination set by the Graduate Division in French or German. During the second year the corresponding examination is to be passed in the second of these languages.

*Program of Study.* The doctorate in Classics involves a *General Field* for all students, namely, Classical Literature and Philology, and a *Special Field*, which may still be Classical Literature and Philology, or alternatively Classical Linguistics, Ancient History, Classical Archaeology, Patristic or Byzantine Studies, or Medieval Latin Studies. In preparation for the qualifying examinations it is normally necessary to devote at least two years of full-time graduate study to courses and seminars in the General and the Special Fields. In addition, the student must complete the Reading Lists in Greek and Latin authors established for his program. The course requirements of the General Field are the equivalent of eight graduate courses or seminars, four in classical Greek and four in classical Latin authors. For the course requirements in the Special Fields, the Reading Lists, and complete information, the student must consult the Department.

*Qualifying Examinations.* Before admission to candidacy, a student must pass a series of qualifying examinations, both written and oral. The written examination covers translation and interpretation of Greek and Latin texts, partly from the Reading Lists

and partly at sight, and an examination on the Special Field. The oral examination, conducted by the doctoral committee, covers both the General Field and the Special Field, with emphasis on the former.

**Dissertation.** A dissertation must be submitted, on a subject approved by the candidate's doctoral committee and normally relating to his Special Field. The dissertation must be the result of original research and constitute a significant contribution to knowledge.

**Final Examination.** This oral examination, administered by the doctoral committee, covers primarily the dissertation and its relation to the field in which the subject lies.

#### Courses Which Do Not Require a Knowledge of Greek or Latin

Classics 141, 142, 143, 144, 145A, 145B, 145C, 146, 151A, 151B, 151C, 161, 162, 166A, 166B, 251A, 251B, 251C, 251D, 252, 253, 254, 255; Greek 40; Latin 40.

## Classics

### Upper Division Courses

#### 141. A Survey of Greek Literature in English.

(Formerly numbered Greek 180.) A study of classical Greek literature, exclusive of the drama, with readings in English. Mr. Gleason, Mr. Lewis

#### 142. Ancient Drama.

(Formerly numbered 113.) Prerequisite: upper division standing or consent of the instructor. A study of the major Greek and Latin dramas in translation. Mr. Gleason, Mr. Sifakis

#### 143. A Survey of Latin Literature in English.

(Formerly numbered Latin 180.) A study of classical Latin literature, exclusive of the drama, with readings in English. Mr. Maslowski

#### 144. A Survey of Mediaeval Latin Literature in English.

(Formerly numbered Latin 181.) A study of the Latin literature of Europe from the end of antiquity to the beginning of the Renaissance, with readings in English.

#### 145A. Byzantine Civilization: Political Theory, Roman Law, and Conflicts with Paganism.

(Formerly numbered 181A-181B.) Mr. Anastos

#### 145B. Byzantine Civilization: Theology and Relations with Rome.

(Formerly numbered 181A-181B.) Mr. Anastos

#### 145C. Byzantine Civilization: Literature, Art, Science, and the Renaissance.

(Formerly numbered 181A-181B.) Mr. Anastos

#### 151A. Classical Archaeology: Graeco-Roman Architecture.

A general introduction to the study of Aegean, Greek, and Roman architecture. Mr. Lattimore

#### 151B. Classical Archaeology: Graeco-Roman Sculpture

A general introduction to the study of Aegean, Greek, and Roman sculpture. Mr. Lattimore

#### 151C. Classical Archaeology: Graeco-Roman Painting.

A general introduction to the study of Aegean, Greek, and Roman painting. Mr. Lattimore

#### 161. Introduction to Classical Mythology.

The origins of classical myth; the substance of divine myth and heroic saga; the place of myth in religion; a survey of the study of classical mythology. Mr. Lattimore, Mr. Sifakis

#### 162. Classical Myth in Literature.

The use of myth in the principal authors and genres of Greek and Roman literature with examples of its influence in later literatures. Mr. Austin, Mr. Lattimore

#### 166A. Greek Religion.

A study of the religion of the ancient Greeks.

#### 166B. Roman Religion.

A study of the religion of the ancient Romans.

#### 199. Special Studies in Classics.

(½ to 2 courses)

Prerequisites: senior standing and consent of the instructor.

#### Graduate Courses

#### 251A. Seminar in Classical Archaeology.

The Aegean Bronze Age.

Mr. Clement, Mr. Lattimore, Mr. Packard

#### 251B. Seminar in Classical Archaeology.

Graeco-Roman architecture.

Mr. Clement, Mr. Lattimore

#### 251C. Seminar in Classical Archaeology.

Graeco-Roman sculpture.

Mr. Clement, Mr. Lattimore

#### 251D. Seminar in Classical Archaeology.

Graeco-Roman painting.

Mr. Clement, Mr. Lattimore

#### 252. Topography and Monuments of Athens.

(Formerly numbered 210.) Detailed studies in the topography and monuments of Athens combining the evidence of literature, inscriptions, and actual remains. Mr. Clement, Mr. Lattimore

#### 253. Topography and Monuments of Rome.

(Formerly numbered 211.) Detailed studies in the topography and monuments of ancient Rome combining the evidence of literature, inscriptions, and actual remains. Mr. Clement, Mr. Lattimore

#### 254. Field Archaeology in Greece.

Prerequisite: consent of the instructor. The methodology of field work in Greece with intensive study of the archaeological work in a selected area of the country. Mr. Clement

**255. Field Work in Greek Archaeology. (2 courses)**

Prerequisite: consent of the instructor. Participation in the excavations at the Isthmian sanctuary of Poseidon near Corinth in Greece. May be repeated for credit. Mr. Clement

**271. Computer Techniques in Classical Studies.**

Survey of computer techniques in the study of the ancient world with emphasis on Greek and Latin literary texts. Students will learn enough computer programming to work on a project of their own during the course. Mr. Packard

## Individual Study and Research

**596. Directed Individual Study or Research.**

(½ to 2 courses) The Staff

**597. Study for the M.A. Comprehensive Examination or the Ph.D. Qualifying Examination.**

(½ to 2 courses) The Staff

**599. Research for the Doctoral Dissertation.**

(½ to 2 courses) The Staff

**Greek**

## Lower Division Courses

**1. Elementary Greek.**

Lecture, four hours per week. Mrs. Killian, Mrs. Mohr

**1A. Elementary Greek (Accelerated).**

Prerequisite: consent of the instructor. Mr. Gleason

**2. Elementary Greek.**

Lecture, four hours per week. Prerequisite: course 1. Mrs. Killian, Mrs. Mohr

**2A. Elementary Greek (Accelerated).**

Prerequisite: course 1A and consent of the instructor. Mr. Gleason

**3. Elementary Greek.**

Lecture, four hours per week. Prerequisite: course 2. Mrs. Killian, Mrs. Mohr

**3A. Elementary Greek (Accelerated).**

Prerequisite: course 2A and consent of the instructor. Mr. Packard

**4. Selected Prose and Composition.**

Prerequisite: course 3. Mr. Gleason, Mrs. Mohr

**10. Elementary Modern Greek.**

Prerequisite: consent of the instructor. An introduction designed to teach the student to pronounce correctly, understand, speak, and write with some facility the language of everyday life. Comparisons with Ancient Greek are made. Mr. Petrounias

**11. Intermediate Modern Greek.**

Prerequisite: course 10 or consent of the instructor. Drill in pronunciation and grammatical patterns. Building-up of vocabulary. Easy readings in literature. Mr. Petrounias

**12. Advanced Modern Greek.**

Prerequisite: course 11 or consent of the instructor. Conversation and composition. A survey of the structure of the language. Mr. Petrounias

**13. Readings in Modern Greek.**

Prerequisite: course 11 or consent of the instructor. Study of the development of Modern Greek literature since the late Middle Ages through analyses of texts. Mr. Petrounias

**40. The Greek Element in English.**

A knowledge of Greek is not required. A study of the derivation and usage of English words of Greek origin: analysis into their component elements directed toward understanding of form and meaning. Mrs. Killian, Mrs. Mohr

## Upper Division Courses

Note: Greek 3A or Greek 4 is a prerequisite to all 100-series language courses in Greek.

**100. Greek Prose Composition.**

(½ course)

(Formerly numbered 165A-165B.) A study of Greek prose style, with exercises in translation from English into Attic Greek. Mr. Lewis

**101A. Homer: Odyssey.**

(Formerly numbered 5.) Mrs. Mohr

**101B. Homer: Iliad.**

(Formerly numbered 102.) Mrs. Mohr, Mr. Travis

**102. Lyric Poets.**

(Formerly numbered 107.) Selections from Archilochus to Bacchylides. Mr. Lewis

**103. Aeschylus.**

(Formerly numbered 104.) Mr. Sifakis, Mr. Travis

**104. Sophocles.**

(Formerly numbered 104.) Mr. Lattimore

**105. Euripides.**

(Formerly numbered 105.) Mrs. Mohr, Mr. Travis

**106. Aristophanes.**

(Formerly numbered 105.) Mr. Sifakis, Mr. Travis

**107. Theocritus.**

Mr. Austin

**111. Herodotus.**

(Formerly numbered 103.) Mr. Gleason

**112. Thucydides.**

(Formerly numbered 103.) Mr. Hoffleit

**113. Attic Orators.**

(Formerly numbered 108.) Mr. Lattimore

**121. Plato.**

(Formerly numbered 101.) Mr. Lewis

**122. Plato: Republic.**

(Formerly numbered 106.) Mr. Hoffleit

**123. Aristotle: Poetics and Rhetoric.**

(Formerly numbered 109.) Mr. Lewis, Mr. Sifakis

**124. Aristotle: Ethics.**

Mr. Hoffleit

**190A-190B-190C. Readings in Greek Literature.**

Prerequisite: three upper division courses in Greek. An intensive reading course in Greek literature in the original, covering the principal authors and periods, with lectures on Greek literary history. Mr. Anastos, Mr. Lewis, Mr. Petrounias

**199. Special Studies in Greek. (½ to 2 courses)**

Prerequisite: senior standing and consent of the instructor. The Staff

**Graduate Courses**

The 200-series courses which are designated A and B (e.g., 201A–201B) are double courses. Course A is a preseminar and is normally prerequisite to course B, a seminar.

**201A–201B. Homer: The Iliad.**

(Formerly numbered 201A.)

Mr. Austin, Mr. Packard

**202A–202B. Homer: The Odyssey and the Epic Cycle.**

(Formerly numbered 201B.)

Mr. Packard

**203. Hesiod.**

Mr. Austin

**204. Homeric Hymns.**

Mr. Packard

**205. Seminar in Aeschylus.**

Mr. Petrounias

**206A–206B. Sophocles.**

(Formerly numbered 202.)

Mr. Hoffleit

**207A–207B. Euripides.**

(Formerly numbered 205.) Mr. Sifakis, Mr. Travis

**208A–208B. Aristophanes.**

(Formerly numbered 204.) Mr. Sifakis, Mr. Travis

**209. Seminar in Hellenistic Poetry.**

Mr. Austin

**210. Advanced Greek Prose Composition.**

Prerequisite: course 100 or the equivalent.

Mr. Gleason, Mr. Hoffleit

**211A–211B. Herodotus.**

Mr. Gleason, Mr. Sifakis

**212A–212B. Thucydides.**

(Formerly numbered 203.)

Mr. Hoffleit

**213. Seminar in Greek Historiography.**

Mr. Brown

**214. Demosthenes.**

Mr. Gleason

**215. Menander.**

Mr. Sifakis

**221. Seminar in the Presocratic Philosophers.**

Mr. Lewis

**222A–222B. Plato.**

(Formerly numbered 261.) Mr. Hoffleit, Mr. Lewis

**223A–223B. Aristotle.**

Mr. Lewis, Mr. Sifakis

**224. Seminar in Post-Aristotelean Philosophy.**

Mr. Maslowski

**230. New Testament Greek.**

The Greek New Testament, as a work of Greek literature, with special emphasis on the information it gives about the culture on the whole, and the language in particular, of the society for which it was produced.

Mr. Sifakis

**231A–231B–231C. Seminar in Patristic and Byzantine Literature.**

Prerequisite: consent of the instructor. Course does not need to be taken in the A–B–C sequence.

Mr. Anastas

**232. Seminar in the History of Classical Scholarship of the Byzantine Period.**

Mr. Anastas

**241. Greek Epigraphy.**

(Formerly numbered 212.) A survey of Greek historical inscriptions, chiefly Attic.

Mr. Clement, Mr. Sifakis

**242A–242B. Greek Dialects and Historical Grammar. (½ course each)**

(Formerly numbered 225 and same as Indo-European Studies 215A–215B.) Prerequisite: consent of the instructor. Credit is given only upon completion of both quarters. Readings in epigraphic Greek texts, both Mycenaean and Classical; the various literary dialects (e.g., Epic, Aeolic, Doric); Greek grammar in the context of Common Greek and Indo-European linguistics. Mr. Fuhvel

**Individual Study and Research****596. Directed Individual Study or Research.**

(½ to 2 courses)

The Staff

**597. Study for the M.A. Comprehensive Examination or the Ph.D. Qualifying Examination.**

(½ to 2 courses)

The Staff

**599. Research for the Doctoral Dissertation.**

(½ to 2 courses)

The Staff

**Latin****Lower Division Courses****1. Elementary Latin.**

Lecture, four hours per week.

The Staff

**2. Elementary Latin.**

Lecture, four hours per week. Prerequisite: course 1. The Staff

**3. Elementary Latin.**

Lecture, four hours per week. Prerequisite: course 2. The Staff

**4. Ovid.**

Prerequisite: course 3.

Mrs. Killian, Mrs. Mohr

**5. Selected Prose and Grammatical Review.**

Prerequisite: course 4.

Mrs. Killian, Mrs. Mohr

**10. Introduction to Mediaeval Latin.**

Prerequisite: course 3 or consent of the instructor. Reading of easy prose texts, with interest centered on basic language training. Mr. Löfstedt

**14. Elementary Latin (Intensive). (2 courses)**

The intensive course in Latin will cover all the declensions of nouns and adjectives, all conjugations in the indicative mood and the primary uses of the



subjunctive mood. Emphasis will be given to the development of the ability to read easy selections of classical prose. Mr. Killian

#### 40. The Latin Element in English.

A knowledge of Latin is not required. A study of the derivation and usage of English words of Latin origin; analysis into their component elements directed toward understanding of form and meaning. Mrs. Killian, Mrs. Mohr

#### Upper Division Courses

Note: Latin 5 is prerequisite to all 100-series language courses in Latin.

#### 100. Latin Prose Composition.

(Formerly numbered 165A-165B.) A study of Latin prose style, with exercises in translation from English into Classical Latin. Mr. Hoffleit, Mrs. Mohr

#### 101. Plautus.

(Formerly numbered 102.) Mr. Sifakis

#### 102. Terence.

(Formerly numbered 102.) Mr. Löfstedt, Mr. Sifakis

#### 103. Lucretius.

Mr. Austin, Mr. Hoffleit

#### 104. Vergil: Georgics.

(Formerly numbered 107.) Mrs. Mohr

#### 105. Vergil: The Aeneid.

Mr. Gleason, Mrs. Mohr

#### 106. Catullus.

(Formerly numbered 101.) Mr. Levine, Mr. Maslowski

#### 107. Horace: Odes and Epodes.

(Formerly numbered 101.) Mr. Levine, Mr. Maslowski

#### 106. Roman Elegy.

(Formerly numbered 105.) Selections from Catullus, Tibullus, and Propertius. Mr. Levine

#### 109. Roman Satire.

(Formerly numbered 106.) Selections from the *Epistles* of Horace, the *Satires* of Juvenal, and the *Epigrams* of Martial. Mr. Gleason, Mr. Levine

#### 111. Livy.

(Formerly numbered 104.) Mr. Hoffleit, Mr. Packard

#### 112. Tacitus.

(Formerly numbered 104.) Mr. Maslowski

#### 113. Cicero: The Orations.

Mrs. Mohr, Mr. Travis

#### 114. Roman Epistolography: Cicero and Pliny.

Mr. Hoffleit

#### 115. Caesar.

Mr. Austin, Mr. Hoffleit

#### 116. Petronius.

Mrs. Mohr

#### 117. Sallust.

Mr. Hoffleit, Mr. Maslowski

#### 131. Medieval Latin Prose.

(Formerly numbered 120.) Prerequisite: course 10 or consent of the instructor. Extensive reading of

selected texts in prose; interest is centered on the idiosyncrasies of Medieval Latin. Mr. Löfstedt

#### 133. Mediaeval Latin Poetry.

(Formerly numbered 123.) Prerequisite: one upper division language course in Latin or consent of the instructor. Emphasis varies from year to year between Christian and secular poetry. Mr. Löfstedt

#### 190A-190B-190C. Readings in Latin Literature.

Prerequisite: three upper division courses in Latin. An intensive reading course in Latin literature in the original, covering the principal authors and periods, with lectures on Latin literary history.

Mr. Gleason, Mr. Levine, Mr. Maslowski

#### 199. Special Studies in Latin. (½ to 2 courses)

Prerequisite: senior standing and consent of the instructor. The Staff

#### Graduate Courses

The 200-series courses which are designated A and B (e.g., 203A and 203B) are double courses. Course A is a preseminar and is normally prerequisite to course B, a seminar.

#### 200. Roman Comedy.

Prerequisite: consent of the instructor. Survey of the history of Roman Comedy. Reading of one comedy by Plautus or Terence with interest centered on language and meter. Mr. Löfstedt

#### 201. Seminar in the Roman Epic: Ennius to Silius Italicus.

(Formerly numbered 206.) The fragments of Ennius and selected readings from the minor epic poets (Lucan, Valerius Flaccus, Statius, Silius Italicus). Mr. Hoffleit

#### 202. Seminar in Catullus.

(Formerly numbered 207.) A detailed consideration of the entire Catullian corpus. Mr. Levine

#### 203A. Elegiac Poetry.

(Formerly numbered 255.) Mr. Levine

#### 203B. Propertius.

(Formerly numbered 255.) Mr. Levine

#### 204A. Vergil's Aeneid.

(Formerly numbered 210.) Mr. Austin, Mr. Travis

#### 204B. The Aeneid.

(Formerly numbered 210.) Mr. Austin, Mr. Travis

#### 205. Seminar in Vergil's Bucolics.

Mr. Austin

#### 206. Horace.

Mr. Austin

#### 210. Advanced Latin Prose Composition.

Prerequisite: course 100 or the equivalent. Mr. Hoffleit, Mr. Levine

#### 211A. Seminar in the Roman Historians.

A study of considerable portions of the writings of Sallust. Mr. Hoffleit

#### 211B. Seminar in the Roman Historians.

A study of considerable portions of the writings of Livy. Mr. Hoffleit

**211C. Seminar in the Roman Historians.**

A study of considerable portions of the writings of Tacitus. Mr. Hoffleit

**220. Cicero's Rhetorical Works.**

(Formerly numbered 211.) Mr. Travis

**221A. Cicero's Philosophical Works.**

(Formerly numbered 202.) Mr. Levine

**221B. Cicero: De Natura Deorum.**

(Formerly numbered 202.) Mr. Levine

**222. Seminar in Roman Stoicism.**

Prerequisite: a reading knowledge of Greek and Latin. Mr. Maslowski

**223. Lucretius.**

Mr. Packard

**231A-231B. Seminar in Mediaeval Latin.**

(Formerly numbered 221.) Prerequisite: at least one upper division course in Latin or consent of the instructor. Studies in various areas of the language and literature of Mediaeval Latin. Mr. Löfstedt

**232. Vulgar Latin.**

(Formerly numbered 220.) Prerequisite: consent of the instructor. History and characteristics of popular Latin; its development into the early forms of the Romance languages. Mr. Löfstedt

**240. History of the Latin Language.**

Prerequisite: consent of the instructor. The development of Latin from the earliest monuments until its emergence in the Romance languages. Mr. Löfstedt

**242A-242B. Italic Dialects and Latin Historical Grammar. (½ course each)**

(Formerly numbered 225 and same as Indo-European Studies 218A-218B.) Prerequisite: consent of the instructor. Credit is given only upon completion of both quarters. The linguistic situation in early Italy; readings in Oscan, Umbrian, and early Latin texts; Latin grammar in the context of Italic and Indo-European linguistics. Mr. Pulvel

**243. Seminar in Latin Palaeography.**

(Formerly numbered 253.) Studies in the development of the book hand in Latin manuscripts earlier than the invention of printing. Mr. Levine

**244. Seminar in Textual Criticism.**

(Formerly numbered 257.) Studies in the preparation of a critical edition of a Latin author. Mr. Travis

**Professional Course in Method****370. The Teaching of Latin.**

Prerequisite: graduate standing or consent of the instructor. Techniques for teaching; organization of courses; review of the content of the curriculum offered in junior and senior high schools. Mrs. Killian

**Individual Study and Research****598. Directed Individual Study or Research.**

(½ to 2 courses)

The Staff

**597. Study for the M.A. Comprehensive Examination or the Ph.D. Qualifying Examination. (½ to 2 courses)**

The Staff

**599. Research for the Doctoral Dissertation. (½ to 2 courses)**

The Staff

**Related Courses in Other Departments****History 111A-111B-111C. History of the Ancient Mediterranean World.**

112A-112B. History of Ancient Greece.

113A-113B. History of Rome.

250A-250B. Seminar in Ancient History.

252A-252B-252C. Seminar in Byzantine History.

**Indo-European Studies****Preparation for the Major**

Required: three courses of Latin; three courses of Greek; three courses of German or Russian.

**The Major**

Required: (1) Indo-European Studies 131, 132, 140, 150, 160, 161, 162; (2) two courses chosen from Indo-European Studies 170, 171, 222A, 223A, 224, 225, 230A; (3) Greek 101A and 101B; (4) one course chosen from Indo-European Studies 133A, 133B, 134, Anthropology 130A, 130B, 131A, 131B, Linguistics 100; (5) one course chosen from Indo-European Studies 149, 167, 168, 169, 178, 179, 188, 189, Linguistics 120A, 120B.

**Admission to Graduate Status**

Students admitted to graduate status must have an A.B. degree with a major in Indo-European Studies from UCLA, or a major in an Indo-European language field (e.g., German, Slavic, Latin, Greek, Romance Languages), or a major in Linguistics (with emphasis on historical linguistics), or a major in Anthropology (with concentration on Europe and Asia). If deficiencies exist in prerequisites to specific work at the graduate level, a student may be admitted conditionally and will be expected to remove these deficiencies as soon as possible upon enrollment.

**Requirements for the Doctor's Degree**

*General Requirements.* See page 156.

*Foreign Language.* During the first year of graduate study, the student is expected to absolve the standard reading examinations set by the Graduate Division in any two of German, French, and Russian. During the

second year a similar test is to be passed in the remaining language, unless the Section of Indo-European Studies is satisfied beforehand with the candidate's facility in its research use.

**Program of Study.** The doctorate in Indo-European Studies is offered with three alternative major emphases: (1) Indo-European linguistics, (2) Indo-Iranian studies, and (3) European and related archaeology. In preparation for the qualifying examinations it is normally necessary to devote at least two years of full-time graduate study to a systematic program of courses and seminars chosen in consultation with the student's guidance committee. (1) The emphasis in Indo-European linguistics requires a concentration in ancient Indo-European languages and comparative grammar, with some work in most of the comparativistically significant ancient dialects and special attention to a number of them. The student must also possess a basic knowledge of phonetics, structural linguistics, and general historical linguistics. Minor fields include European archaeology and Indo-European mythology, with participation in the relevant seminars. (2) The emphasis in Indo-Iranian studies requires a concentration in Indic languages from Vedic to Middle Indic, and in Iranian languages from Avestan to Middle Iranian. Modern forms of Indo-Aryan and Iranian languages may also be included. Minor fields include Indo-European linguistics and mythology. In the former, basic competence is expected in comparative grammar, Homeric Greek, and two other ancient Indo-European languages. (3) The archaeological emphasis requires a concentration in European and related (Near Eastern, Western and Central Asian) archaeology, with particular attention to the problems of Indo-European origins and prehistory. In addition to work offered by the Section of Indo-European Studies, the student is expected to avail himself of archaeological offerings in the Department of Anthropology and to gain some experience in archaeological field work. Minor fields include Indo-European linguistics and mythology. In the former, basic competence is expected in comparative grammar, Vedic Sanskrit, Homeric Greek, and two other ancient Indo-European languages (e.g., Old Iranian, Hittite, Classical Armenian, Lithuanian, or Old Church Slavic for a student with an "eastern" archaeological emphasis, or Italic, Celtic, and Germanic languages for those whose researches will stress Western Europe).

**Qualifying Examinations.** Before admission to candidacy, a student must pass a series of qualifying examinations, both written and oral. The written examination covers the major and minor fields and includes translation and analysis of passages from prescribed texts in ancient Indo-European languages. The oral examination, conducted by the doctoral committee, probes the student's grasp of the entire program.

**Dissertation.** A dissertation must be submitted, on a subject approved by the candidate's doctoral committee, dealing with a segment of the major field or combining the major and minor fields. The dissertation must be the result of original research and constitute a significant contribution to knowledge.

**Final Examination.** This oral examination, administered by the doctoral committee, covers the dissertation and its place both within the candidate's field of emphasis and the discipline as a whole.

#### Upper Division Courses

#### 130. Introduction to European Archaeology. (½ course)

Geography, principles, strategy of research, and bibliography of European archaeology.

#### 131. European Archaeology: The Neolithic Period.

(Formerly numbered 140.) A survey of European cultures from the beginning of the food-producing economy in the 7th millennium B.C. to the beginning of the Bronze Age in the 3rd millennium B.C.

Mrs. Gimbutas

#### 132. European Archaeology: The Bronze Age.

(Formerly numbered 142.) Prerequisite: course 131 or consent of the instructor. A survey of European cultures from around 3000 B.C. to the period of the destruction of the Mycenaean culture about 1200 B.C. The course covers the Aegean area and the rest of Europe.

Mrs. Gimbutas

#### 133A-133B. European Archaeology: The Iron Age.

(Formerly numbered 143.) Prerequisite: course 132 or consent of the instructor. A survey of Iron Age cultures, with emphasis on Hallstatt, La Tène, and Scythian cultures and art.

#### 134. Eastern Mediterranean and Anatolian Archaeology.

(Formerly numbered 144.) A survey of Eastern Mediterranean and Anatolian archaeology, with emphasis on Neolithic and Bronze Age cultures.

#### 135. History of European and Near Eastern Archaeology. (½ course)

A systematic survey of the development of archaeology as a scientific field, with emphasis on the nuclear zones of Old World civilization.

**140. Introduction to Indo-European Mythology.**

(Formerly numbered 145.) Recommended preparation: Classics 161. A basic comparative survey of the mythic and religious traditions of ancient India, Iran, Anatolia, and the early Baltic, Slavic, Germanic, Italic, and Celtic peoples. Mr. Puhvel

**149. Introduction to Historical Linguistics.**

(Same as Linguistics 110 and Anthropology 113.) Prerequisite or corequisite: Linguistics 100 or equivalent. The methods and theories appropriate to the historical study of language, such as the comparative method and method of internal reconstruction. Sound change, grammatical change, semantic change. Mr. Anttila, Mr. Hoijer

**150. Introduction to Indo-European Linguistics.**

(Same as Linguistics 150.) Prerequisite: one year of college-level study (course 3 or better, 8 units minimum) of either Greek or Latin and either German or Russian. A survey of the Indo-European languages from ancient to modern times; their relationships and their chief characteristics. Mr. Anttila, Mr. Puhvel

**160. Elementary Sanskrit.**

Introduction to script and grammar, with reading exercises and attention to the significance of Sanskrit for the understanding of other Indo-European languages. Mr. Scharfe

**161. Intermediate Sanskrit.**

Prerequisite: course 160 or equivalent. Advanced aspects of grammar and the reading of literary texts. Mr. Scharfe

**162. Advanced Sanskrit.**

Prerequisite: course 161 or equivalent. In this course the entire Bhagavadgita or a comparable amount of other Sanskrit literature is read. Mr. Scharfe

**163. Readings in Sanskrit.**

Prerequisite: course 162 or equivalent. Extensive reading in such texts as best serve the students' needs. Mr. Scharfe

**167. Introduction to Indic Philosophy.**

A survey of the main trends in Indian philosophy from ancient to modern times. Mr. Scharfe

**168. Survey of Sanskrit Literature in Translation.**

A general course dealing with Sanskrit literature of India from Vedic times to the present. No knowledge of Sanskrit is required. Mr. Scharfe

**169. Civilization of Pre-Islamic Iran.**

A survey of Iranian culture from the beginnings through the Sasanian period. Mr. Schmidt

**170. Elementary Lithuanian.**

Introduction to pronunciation and grammar, with reading exercises.

**171. Intermediate Lithuanian.**

Prerequisite: course 170 or equivalent. Grammar and readings.

**172. Advanced Lithuanian.**

Prerequisite: course 171 or equivalent. Readings in Lithuanian texts, with grammatical and stylistic considerations.

**177. Baltic Languages and Cultures. (½ course)**

A general survey of the peoples speaking Old Prussian, Lithuanian, and Latvian; their linguistic, historical, and ethnic affiliations. Mrs. Gimbutas

**178. Survey of Lithuanian Literature in Translation.**

A general course dealing with literature in Lithuania from the beginnings to the present. No knowledge of Lithuanian is required.

**179. Introduction to Baltic and Slavic Folklore and Mythology.**

(Same as Folklore 126.) A general course for students interested in folklore and mythology and for those interested in Indo-European mythic antiquities. Mrs. Gimbutas

**180. Elementary Modern Irish.**

Introduction to script, pronunciation, and grammar, with reading exercises.

**181. Intermediate Modern Irish.**

Prerequisite: course 180 or equivalent. Grammar and readings.

**182. Advanced Modern Irish.**

Prerequisite: course 181 or equivalent. Readings in Irish texts, with grammatical and stylistic considerations.

**185. Elementary Modern Welsh.**

Introduction to pronunciation and grammar, with reading exercises.

**186. Intermediate Modern Welsh.**

Prerequisite: course 185 or equivalent. Grammar and readings.

**187. Advanced Modern Welsh.**

Prerequisite: course 186 or equivalent. Readings in Welsh texts, with grammatical and stylistic considerations.

**188. Survey of Irish Literature.**

A general course dealing with literature in Ireland from the earliest times to the present. No knowledge of Irish is required.

**189. Introduction to Celtic Folklore and Mythology.**

(Same as Folklore 122.) A general course for the student in folklore, with emphasis on the types of folklore research currently practiced in Eire and the mythic traditions of the Irish and Welsh.

**199. Special Studies. (½ to 2 courses)**

The Staff

**Graduate Courses****209. Historical Linguistics.**

(Same as Linguistics 202.) Prerequisite: course 149 or equivalent. Advanced study of the comparative method, historical and internal reconstruction, internal and external borrowing. Mr. Anttila, Mr. Hoijer

**210. Indo-European Linguistics: Advanced Course.**

Prerequisite: course 150 or equivalent. Comparative study of phonology, morphology, syntax, and lexicon. Problems in analysis and reconstruction. Mr. Anttila, Mr. Puhvel

**215A-215B. Greek Dialects and Historical Grammar.** (½ course each)

(Same as Greek 242A-242B.) Credit is given only upon completion of both quarters. Prerequisite: consent of the instructor. Readings in epigraphic Greek texts, both Mycenaean and classical; the various literary dialects (e.g., Epic, Aeolic, Doric); Greek grammar in the context of Common Greek and Indo-European linguistics. Mr. Puhvel

**218A-218B. Italic Dialects and Latin Historical Grammar.** (½ course each)

(Same as Latin 242A-242B.) Credit is given only upon completion of both quarters. Prerequisite: consent of the instructor. The linguistic situation in early Italy; readings in Oscan, Umbrian, and early Latin texts; Latin grammar in the context of Italic and Indo-European linguistics. Mr. Puhvel

**220A-220B. Hittite.** (½ course each)

Credit is given only upon completion of both quarters. Prerequisite: consent of the instructor. Introduction to cuneiform Hittite script and grammar, with practice in political, historical, legal, and literary texts; linguistic and other aspects of Anatolia in the 2nd millennium B.C. and survivals into Graeco-Roman times. Mr. Puhvel

**221. Introduction to Pañini's Grammar.**

Prerequisite: course 162 or equivalent. Reading of selected passages of the text with an introduction into Pañini's technique. Mr. Scharfe

**222A-222B. Vedic.**

Prerequisite: a knowledge of Sanskrit equivalent to course 162, and consent of the instructor. Characteristics of the Vedic dialect and readings in the Rig-Vedic hymns. Mr. Schmidt

**223A-223B. Pali and Prakrits.**

Prerequisite: a knowledge of Sanskrit equivalent to course 161, and consent of the instructor. Grammatical studies and reading of texts. Comparative considerations. Mr. Scharfe

**224. Old Irish.**

Prerequisite: consent of the instructor. Studies in grammar. Readings in the glosses and other texts. Comparative considerations.

**225. Mediaeval Welsh.**

Prerequisite: consent of the instructor. Studies in grammar. Readings in the Mabinogi and other texts. Comparative considerations.

**226. Celtic Linguistics.**

(Formerly numbered 213.) Prerequisite: course 224, or 225, or consent of the instructor. A survey of salient features of the Celtic linguistic stock in its Gaelic and British branches, with reference to the position of Celtic within Indo-European languages.

**230A-230B. Old Iranian.**

(Formerly numbered 223.) Prerequisite: consent of the instructor. Studies in the grammars and texts of Old Persian and Avestan. Comparative considerations. Mr. Schmidt

**231A-231B. Middle Iranian.**

Prerequisite: consent of the instructor. Studies in the grammars and texts of such Middle Iranian lan-

guages as best serve the students' needs (e.g., Pahlavi, Sogdian, Sakan). Mr. Schmidt

**235. Albanian.**

Prerequisite: consent of the instructor. Grammar, texts, dialectal variations; historical and comparative data.

**240. Tocharian.**

Prerequisite: consent of the instructor. Studies in grammar; comparative considerations. Reading of texts.

**250A-250B. Seminar in European Archaeology.**  
(½ course each)

(Formerly numbered 255A-255B. Same as Anthropology 268A-268B.) Credit is given only upon completion of both quarters. Prerequisite: consent of the instructor. Studies in ancient European archaeological materials, and their relationship to the Near East, Western Siberia, and Central Asia. Mrs. Gimbutas

**251. Seminar in Early Iron Age Archaeology.**

(Formerly numbered 256.) Prerequisite: consent of the instructor. Studies in Villanovan, Hallstatt, La Tène, Early Germanic, Scythian, and other cultures and art.

**252. Seminar in Eastern Mediterranean Archaeology.**

(Formerly numbered 257.) Prerequisite: consent of the instructor. Studies in Eastern Mediterranean and Anatolian cultures, throughout the sixth, fifth, fourth, third, and second millennia B.C.

**259. Field Work in Old World Archaeology.**

Prerequisite: consent of the instructor. Participation in archaeological excavations or other archaeological research in Europe or the Near East under the auspices of the UCLA Museum or other institutions. Excavations in the Americas may be substituted with the consent of the instructor in charge. Minimum one month. Mrs. Gimbutas in Charge

**260A-260B. Seminar in Indo-European Mythology.**  
(½ course each)

Credit is given only upon completion of both quarters. Prerequisite: consent of the instructor. Studies in ancient Indo-European mythic and religious traditions and their relationship to the myths of the Mediterranean, the Near East, and the Finno-Ugric area. Mr. Puhvel

**270A-270B. Seminar in Historical Linguistics.**

(Same as Linguistics 270A-270B.) Prerequisite: course 209 or equivalent. Problems in the use of the comparative method in historical linguistics and in the internal reconstruction of the history of languages. Mr. Anttila

**280A-280B. Seminar in Indo-European Linguistics.**

Prerequisite: course 210. Selected topics in Indo-European comparative grammar for advanced graduate students. Mr. Anttila, Mr. Puhvel

Individual Study and Research

**596. Directed Individual Studies.** (½ to 2 courses)

(Formerly numbered 297.)

The Staff

**597. Preparation for Doctoral Qualifying Examination. (½ to 2 courses)****599. Research for Dissertation. (½ to 2 courses)**

(Formerly numbered 299.)

The Staff

**Finno-Ugric Studies**

Upper Division Courses

**130. Elementary Finnish.**

(Formerly numbered 101.) Introduction to grammar and reading exercises.

Mrs. Rank

**131. Intermediate Finnish.**

(Formerly numbered 102.) Prerequisite: course 130 or equivalent. Grammatical exercises and reading of texts.

Mrs. Rank

**132. Advanced Finnish.**

(Formerly numbered 103.) Prerequisite: course 131 or equivalent. Readings in literary texts.

Mrs. Rank

**133. Readings in Finnish.**

(Formerly numbered 104.) Prerequisite: course 132 or equivalent. Large selections of Finnish prose and poetry read in the original.

Mrs. Rank

**135. Finnish Folk Art and Technology.**

(Formerly numbered 139B and same as Folklore 124.) Material manifestations of Finnish folk culture: village layout and architecture, folk technology, arts and crafts, textiles, costume and design, etc.

Mrs. Rank

**138A-138B. Survey of Finnish Literature in Translation.**

(Formerly numbered 110.) Intended for students in general and comparative literature as well as students interested in Finno-Ugric studies. Main trends and contacts with other literatures are surveyed. Special attention is paid to the Kalevala. Mrs. Rank

**139A-139B. Introduction to Finnish Folklore and Mythology.**

(Formerly numbered 139A and same as Folklore 123A-123B.) The methods and results of Finnish folklore studies and the mythic traditions of the Finns. In 139A, special attention is paid to the oral epic and the Kalevala; in 139B, the lyric folk poetry, ballads, folktales and legends.

Mrs. Rank

**150. Elementary Hungarian.**

(Formerly numbered 105.) Introduction to grammar and reading exercises.

Mrs. Birnbaum

**151. Intermediate Hungarian.**

(Formerly numbered 106.) Prerequisite: course 150 or equivalent. Grammatical exercises and reading of texts.

Mrs. Birnbaum

**152. Advanced Hungarian.**

(Formerly numbered 107.) Prerequisite: course 151 or equivalent. Readings in literary texts.

Mrs. Birnbaum

**153A-153B. Readings in Hungarian.**

(Formerly numbered 108.) Prerequisite: course 152 or equivalent. Large selections of Hungarian prose and poetry read in the original. Mrs. Birnbaum

**158A-158B. Survey of Hungarian Literature in Translation.**

(Formerly numbered 111.) Intended for students in general and comparative literature as well as students interested in Finno-Ugric studies. Main trends and contacts with other literatures are surveyed.

Mrs. Birnbaum

**159. Introduction to Hungarian Folklore and Mythology.**

(Same as Folklore 128.) A general course for the student in folklore and mythology, with emphasis on types of folklore and varieties of folklore research.

Mrs. Birnbaum

**169. Folklore and Mythology of the Finnic Peoples.**

(Same as Folklore 125.) Survey of the traditions of the smaller Finnic nationalities (Estonians, Lapps, Mordvins, Cheremis, etc.).

Mrs. Rank

**179. Folklore and Mythology of the Ugric Peoples.**

(Same as Folklore 129.) Survey of the traditions of the smaller Ugric nationalities (Voguls, Ostyaks, etc.).

**199. Special Studies. (½ to 2 courses)**

The Staff

Graduate Courses

**210. Finno-Ugric Linguistics.**

(Formerly numbered 217. Same as Linguistics 225L.) Prerequisite: consent of the instructor. Survey of the history and structure of the chief representatives of the Finno-Ugric language group.

**251. Seminar in Finno-Ugric Folklore and Mythology.**

(Same as Folklore 251.) Prerequisite: course 169 or consent of the instructor. Advanced studies in the folk traditions and mythologies of the Finno-Ugric speaking nations.

Related Courses in Other Departments

**Ancient Near East (Near Eastern Languages)****160A-160B. Introduction to Near Eastern Archaeology.****161A-161B-161C. The Archaeology of Mesopotamia.****250. Seminar in Ancient Near Eastern Archaeology.****Anthropology 130A-130B. Origins of Old World Civilization.****131A-131B. Old Stone Age Archeology.****138A-138B. The Strategy of Archeology.****139. Dating Techniques in Archeology.****163. History of Archeology.****181. Methods and Techniques of Field Archeology.****182. Methods and Techniques of Archeology.****230. Analytical Methods in Archeological Studies.****271. Historical Reconstruction and Archeology.****273. Problems in Old World Archeology.**

- Armenian (Near Eastern Languages)**  
 130A-130B. Elementary Classical Armenian.  
 131A-131B. Intermediate Classical Armenian.  
 132A-132B. Advanced Classical Armenian.  
**Classics 161.** Introduction to Classical Mythology.  
 251A. Seminar in Classical Archaeology.  
**English 210.** Readings in Old English literature.  
**German 230.** Survey of Germanic Philology.  
 231. Gothic.  
 232. Old High German.  
 233. Old Saxon.  
 245A. Germanic Religions and Mythology.  
 245B. Germanic Antiquities.  
 252. Seminar in Historical and Comparative German Linguistics.  
**Hindi (South Asian Languages)**  
 171A-171B-171C. Hindi.

- Linguistics 100.** Introduction to Linguistics.  
 103. Introduction to General Phonetics.  
 120A-120B. Linguistic Analysis.  
 160. History of Linguistics through the 19th Century.  
 200A. Phonology Theory I.  
 225A. Linguistic Structures: Indo-European.  
 225E. Linguistic Structures: Indo-Aryan.  
**Scandinavian 151.** Elementary Old Icelandic.  
 152. Intermediate Old Icelandic.  
**Slavic 201.** Introduction to Old Church Slavic.  
 202. Introduction to Comparative Slavic Linguistics.  
 241A-241B. Advanced Old Church Slavic.  
 242A-242B. Comparative Slavic Linguistics.  
**Urdu (Near Eastern Languages)**  
 101A-101B-101C. Elementary Urdu.

## ■ COMPARATIVE LITERATURE

- Arnold J. Band, Ph.D., *Professor of Hebrew (Chairman).*  
 Marc Bensimon, Ph.D., *Professor of French.*  
 Pier-Maria Pasinetti, Ph.D., *Professor of Italian.*  
 James Kerans, Ph.D., *Associate Professor of Theatre Arts.*  
 J. Norman H. Austin, Ph.D., *Assistant Professor of Classics.*  
 Frederick Lorrain Burwick, Ph.D., *Assistant Professor of English.*  
 Robert M. Maniquis, Ph.D., *Assistant Professor of English.*  
 George S. Rousseau, Ph.D., *Assistant Professor of English.*  
 Ross P. Shideler, Ph.D., *Assistant Professor of Scandinavian Languages and Comparative Literature.*  
 E. Bond Johnson, III, M.A., *Acting Assistant Professor of German.*

### Graduate Courses

#### 200. The Methodology of Comparative Literature.

Seminar, three hours. Prerequisite: consent of the instructor. A study of both the methodology of comparative literature and the theory of literature.

Shideler

#### 220. From Epic to Novel.

Seminar, three hours. Prerequisites: Literature proficiency in one language, ancient or modern. A comparative study of the themes and techniques germane to each genre.

Austin

#### 250. The Classical Tradition in Eighteenth Century English Literature.

Seminar, three hours. Prerequisite: A reading knowledge of Greek or Latin. A study of the confrontation of eighteenth century English writers with Greek and Latin literary works and traditions.

Rousseau

#### 260. Literature and the Other Arts in the Renaissance.

Seminar, three hours. Prerequisite: Literature proficiency in either French, Italian or Spanish. A

comparative study of literature and the other art media in the Renaissance.

Bensimon

#### 270. The Dream in English and German Romantic Literature.

Seminar, three hours. Prerequisite: Literature proficiency in German. A study of the use of the dream as a standard narrative technique in English and German Romantic Literature.

Burwick

#### 275. The Novel in England and France in the Nineteenth Century.

Seminar, three hours. Prerequisite: Literature proficiency in French. A discussion of historical and psychological aspects of structure in nineteenth century French and English novel; close readings of selected novels will precede discussion of recent structuralist criticism and the place of the novel in socio-literary theory.

Maniquis

#### 280. The Symbolist Movement in Poetry.

Seminar, three hours. Prerequisite: Literature proficiency in either French or German. A study of the Symbolist tradition in English, French, and German Poetry.

Shideler

## ■ COMPUTER SCIENCES

Studies related to computer science are possible in several academic departments. Detailed information is given in the announcements of the individual departments that are listed below.

### **Biomathematics**

Course work in mathematical modeling, simulation and other computer techniques in the health sciences, including computer graphics.

### **Business Administration**

Master of Science, and Ph.D. degree programs with specialization in computer methods and information systems.

### **Engineering**

Master of Science and Ph.D. degree programs with specialization in control systems, communication theory, computer applications, computer languages, and computer systems.

### **Library Service**

Master of Science degree in Information Science (Documentation).

### **Linguistics**

Course work in mathematical linguistics and computational linguistics.

### **Mathematics**

Course work in numerical analysis, logical design, and programming.

### **Psychology**

Course work in mathematical psychology, factor analysis and multivariate analysis, and in computer techniques in the behavioral sciences.

### **Public Health**

Master of Science and Ph.D. degree programs in Biostatistics with specializations in data processing and computer assisted statistical analysis.

## ■ COUNCIL ON EDUCATIONAL DEVELOPMENT

The Council on Educational Development (CED), created by the Los Angeles Division of the Academic Senate in May 1968, is charged to study and encourage educational reforms and innovations; "to sanction with the consent of directly concerned departments, colleges or schools, extra-departmental courses and programs; and to monitor and evaluate such courses and programs. . . ."

Courses and/or programs sponsored by the CED such as student-faculty courses conducted by the Committee for the Study of Education and Society (CSES) are listed in current Class Schedules. Information on offerings may be obtained from the Office of the Vice Chancellor, Student and Curricular Affairs, Murphy Hall, UCLA.

## ■ DANCE

(Department Office, 205 Women's Gym)

Juana de Laban, Ph.D., *Professor of Dance.*

Alma M. Hawkins, Ed.D., *Professor of Dance (Chairman of the Department).*

Pia Gilbert, *Associate Professor of Dance.*

Carol Scothorn, M.A., *Associate Professor of Dance.*

Penelope Leavitt, M.A., *Assistant Professor of Dance.*

Malcolm McCormick, M.A., *Assistant Professor of Dance.*



Elsie Dunin, M.A., *Lecturer in Dance.*

Elizabeth Greenhut, M.A., *Lecturer in Dance.*

Hazel Hood, *Lecturer in Dance.*

Margalit Oved Marshall, *Lecturer in Dance.*

John Martin, *Lecturer in Dance.*

Emilio Pulido-Huizar, *Associate in Dance.*

William Ross, *Lecturer in Dance.*



Mia Slavenska, *Lecturer in Dance.*  
 Doris Siegel, *Lecturer in Dance.*  
 Allegra Snyder, M.A., *Lecturer in Dance.*

The dance major offered in the College of Fine Arts leads to the Bachelor of Arts degree. For requirements of the College of Fine Arts, see page 90.

#### Preparation for the Major

Dance 30A-30B, 35, 36A-36B-36C, 37A-37B-37C, 38 and 70A; and two courses (including at least one course with an asterisk) chosen from Art 1A-1B-1C, 10A\* -10B,\* 25,\* 30B,\* Humanities 1A-1B, Music 2A-2B, and Theater Arts 5B.

#### The Major

A total of 14½ courses including Dance 150A-150B-150C, 151A-151B, 152A-152B, 153A-153B-153C, 154, 158A-158B, and 159; Physical Education 111A-111B, three courses (12 units) chosen from Art 110A-110B-110C, 112A-112B, 118A-118B, Dance 140A-140B-140C, English 103, 111, Folklore 101, 105, Music 140A-140B, 135A-135B, Philosophy 160, Theater Arts 102A-102B, 118A-118B, 122, 145.

With department approval, in the senior year, students who give evidence of commitment and special preparation for graduate study may be permitted to substitute certain courses, as follows: students with a dance ethnology focus may substitute a year of ethnic dance for 153ABC; and course 140A for 152A-B. Students with a dance therapy focus may substitute 165ABC for 153ABC; and Psychology 127 for Dance 152A-B. The department adviser should be consulted about other special preparatory courses needed for graduate study in dance ethnology and dance therapy.

#### Admission to Graduate Status

In addition to meeting the requirements of the Graduate Division as stated in the announcement of the Graduate Division, the student must have an undergraduate major in dance or equivalent preparation with a minimum of 9 upper division courses in the dance concentration. Students whose preparation is deficient, as determined by Graduate Admissions, will be required to make up such deficiencies in addition to the degree program. For more detailed information, write to the Chairman of the Department of Dance and enclose a transcript or summary of academic record.

#### Requirements for the Master's Degree

Graduate students may follow the thesis plan or the comprehensive examination plan (see page 155). The candidate's course of study will be planned under the guidance of the graduate adviser. Emphasis may be placed on dance history and philosophy, choreography, ethnic forms, dance therapy, or dance education.

**Thesis Plan.** A minimum of nine courses and a thesis. Choreography of major proportion is acceptable as a thesis.

**Comprehensive Examination Plan.** A minimum of 10 courses, including an independent study project and a final comprehensive examination.

#### Lower Division Courses

##### 10A-10B-10C. Fundamentals of Creative Dance.

(½ course each)

For non-dance majors. Courses must be taken in sequence. Study of dance through varied experience in movement including historical and contemporary forms with emphasis on increasing ability to use movement creatively and to relate to dance the principles and elements of other arts. **The Staff**

##### 11A-11B-11C. Creative Dance. (½ course each)

Prerequisite: course 10C or consent of the instructor. For non-dance majors. A continuing study of dance with emphasis on movement principles and composition.

##### 20. Movement for the Stage. (½ course)

(Formerly numbered 34.) Three hours lecture and laboratory. Movement for the theater specifically designed to extend the actor's creation of a role. **Miss Laban**

##### 30A-B. Fundamentals of Ballet. (½ course each)

Open only to dance majors. Courses must be taken in sequence, 30A taken concurrently with 36C, and 30B concurrently with 37C. Study of ballet techniques and principles including dance terminology. **Mr. Ross**

##### 35. Music Analysis for Dance. (½ course)

Study of the elements of music, music structures, and their relationship to dance, with emphasis on rhythmic analysis, dance accompaniment and teacher-accompanist roles. **Mrs. Gilbert**

##### 36A-36B-36C. Fundamentals of Creative Dance.

(½ course each)

Open only to dance majors. Courses must be taken in sequence. Study of dance through varied experience in movement including historical and contemporary forms with emphasis on increasing ability to use movement creatively and to relate to dance the principles and elements of other arts. **Miss Leavitt**

**37A-37B-37C. Creative Dance. (½ course each)**

Prerequisite: course 36C. A continuing study of dance with emphasis on movement principles and choreography.

**38. Dance Notation. (½ course)**

Prerequisite: courses 35 and 36C. Study of Labanotation with experiences in recording and interpreting dance scores. Mrs. Scothorn

**70A-70B. Introduction to Performance in Ethnic Dance. (½ course each)**

Study of basic movement in ethnic dance forms. Mrs. Dunin

**71A-71P. Performance Courses in Ethnic Dance. (½ course each)**

Each course may be repeated for a maximum of four units. (A) Dance of Bali; (B) Dance of Ghana; (C) Dance of Greece; (D) Dance of Hawaii; (E) Dance of India; (F) Dance of Israel; (G) Dance of Japan; (H) Dance of Java; (J) Dance of Mexico; (K) Dance of Philippines; (L) Dance of Scotland; (M) Dance of Spain; (N) Dance of Thailand; (P) Dance of Yugoslavia. The Staff

Upper Division Courses

**112A-112B. Advanced Dance. (½ course each)**

For non-dance majors. Prerequisite: course 11C. Synthesis of previous dance experience, advanced technique, and individual and group choreography.

**121. Movement for the Stage. (½ course)**

Prerequisite: course 20. Styles and forms of period movement and their media of expression. Miss Laban

**131A-131B. Advanced Ballet. (½ course each)**

Prerequisite: course 30B or consent of instructor. Open only to dance majors. Courses must be taken in sequence. Study of advanced techniques and principles of classical ballet including phrasing, combinations, and repertory works. Miss Slavenska

**140A-140B-140C. Dance Cultures of the World.**

(Formerly numbered 170.) A survey of dance in selected cultures, the role of dance in society; consideration of style, rhythmic structure, historical background and related folklore. Lectures illustrated with demonstrations, film, slides and recordings: (A) Africa (folk and tribal traditions); (B) Asia (art, tribal and folk traditions); (C) North American Indians (tribal and folk traditions).

**141. Dance of Africa.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of Africa, factors influencing its development and social functions, consideration of relationship of dance to other art forms.

**142. Dance in the Balkans.**

Prerequisite: enrollment in an ethnic dance class. An introduction to dance of the Balkans, including factors influencing development and social functions, and consideration of relationship of dance to other art forms. Mrs. Dunin

**143. Dance in India.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of India, including factors influencing development and social functions, and consideration of relationship of dance to other art forms.

**144. Dance in Indonesia.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of Indonesia, including factors influencing development and social functions, and consideration of relationship of dance to other art forms. Mrs. Hood

**145. Dance in Japan.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of Japan, including factors influencing development and social functions, and consideration of relationship of dance to other art forms.

**146. Dance in Latin America.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of Latin America, including factors influencing its development and social functions and consideration of the relationship of dance to other art forms. Mr. Pulido-Huizar

**147. Dance in Indian Cultures of Americas.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of the Indian cultures of the Americas, including factors influencing development and social functions and consideration of the relationship of dance to other art forms.

**148. Dance in the United States and Canada.**

Prerequisite: enrollment in an ethnic dance class. An introduction to the dance of the United States and Canada, including factors influencing the development and social functions and consideration of the relationship of dance to other art forms.

**150A-150B-150C. Advanced Dance.**

(½ course each)

Prerequisite: course 37C. Choreography with emphasis on the use of composed music, the group composition, and the theatrical environment; synthesis of previous dance experience, theories and technique of outstanding dance artists; principles of human movement related to dance. Mrs. Scothorn

**151A. History of Dance—Primitive to Renaissance.**

The evolution of the dance as an art form and its cultural implications from the primitive through the Renaissance periods. Miss Laban

**151B. History of Dance—Baroque to 20th Century.**

A study of changing concepts in the styles and forms of dance from the Baroque to the 20th Century. Miss Laban

**152A-152B. Organization of Dance Performances.**

(½ course each)

Prerequisite: senior standing or consent of the instructor. Consideration of purpose and materials for dance productions. Mrs. Scothorn

**153A-153B-153C. Dance Composition.**

(½ course each)

Prerequisite: course 150C. Choreographic problems in historical styles and contemporary trends. Independent work in solo and group composition.

**154. Music as Dance Accompaniment.**

Prerequisite: course 35 or consent of the instructor. Piano and percussion improvisation for dance.

Choreographer-composer relationships. History of music for the dance with emphasis on contemporary trends. Music for the dance performance.  
Mrs. Gilbert

**158A-158B. Philosophical Bases and Trends in Dance.** (1, ½ course)

Prerequisite: course 150C. Critical analysis of dance as a creative experience and the role of professional and educational dance in our society. Study of selected approaches to current development in dance.  
Miss Hawkins

**159. Advanced Dance Notation.**

Prerequisite: course 38. Study of advanced Labanotation, history of various other systems, and survey of notated literature.  
Mrs. Scothorn

**160. Creative Dance for Children.**

Prerequisite: course 150C or consent of the instructor. Study of dance as an expressive medium for children with emphasis on concepts and principles.

**165A-165B-165C. Introduction to Movement**

**Dynamics and Personality Growth.** (½ course each)

Prerequisite: 150C or consent of instructor. Courses must be taken in sequence. Study of movement experience as a means of increasing awareness, spontaneity, and self-directed non-verbal response to inner and outer stimuli. Emphasis on the dynamic (energy and spatial) aspects of movement with special attention to the felt-dimension associated with the experiencing.  
Mrs. Taylor

**170A-170B. Introduction to Performance in**

**Ethnic Dance.** (½ course each)

Study of basic movement in ethnic dance forms.  
The Staff

**171A-171P. Performance Courses in Ethnic Dance.**

(½ course each)

Each course may be repeated for a maximum of four units but may not be taken for credit if the same course has been taken from the 71 series. (A) Dance of Bali; (B) Dance of Ghana; (C) Dance of Greece; (D) Dance of Hawaii; (E) Dance of India; (F) Dance of Israel; (G) Dance of Japan; (H) Dance of Java; (J) Dance of Mexico; (K) Dance of Philippines; (L) Dance of Scotland; (M) Dance of Spain; (N) Dance of Thailand; (P) Dance of Yugoslavia. The Staff

**190. Advanced Dance Performance.** (½ to 1 course)

Prerequisite: consent of the instructor. The study of performance of major choreography.  
Mrs. Scothorn

**197A-197B. Proseminar: Dance Perspectives.**

(½ course each)

Prerequisite: upper division standing or consent of the instructor. Consideration of the aesthetic evolving from the work of the great artists of our time.  
Mr. Martin

**198A-198B-198C. Special Courses in Dance.**

(½ or 1 course)

Prerequisite: consent of the instructor.

**199. Special Studies in Dance.** (½ or 1 course)

Prerequisite: senior standing and consent of the instructor.  
Miss Hawkins

**Graduate Courses**

Not open to undergraduate students. See College of Fine Arts, Unit Requirements, page 90.

**200. Dance Notation.** (½ course)

Prerequisite: course 159. Advanced study of dance notation.  
Mrs. Scothorn

**202. Research Methods and Bibliography in Dance.**

Miss Laban

**204A-204B-204C. Advanced Choreography.**

(½, 1, ½ course)

Prerequisite: course 153C or the equivalent. Theoretical and creative aspects of advanced choreography.  
Mrs. Scothorn

**206. Music for Dance.**

Prerequisite: course 154. Theory of the aesthetic and functional relationship of music to dance.  
Mrs. Gilbert

**208. Principles of Dance Theater.**

Prerequisites: course 152A-152B. Principles which serve the presentation of dance.  
Mrs. Scothorn

**210. Aesthetics of Dance.**

Prerequisite: course 158B. A critical analysis of aesthetic concepts related to dance.  
Miss Laban

**220. Dance in the 20th Century.**

Prerequisite: courses 151A-151B. Concepts, styles and forms of dance in the 20th century.  
Miss Laban

**221. The History of Ballet.**

Prerequisite: courses 151A, 151B. The development of ballet in its various stages: Renaissance, Baroque, Romantic Period; stylistic differences in Italy, France, Spain, and England; influence of the other arts; and problems of ballet as an art form.  
Miss Laban

**226. Dance Expressions in Selected Cultures.**

Prerequisite: consent of instructor. Dance as a social and cultural experience in the life of man.

**227. Advanced Studies in Dance Education.**

Prerequisite: consent of the instructor. Concepts relating to the development of creativity and artistic integrity in dance.  
Miss Hawkins

**251A-251B-251C. Dance in Rehabilitation.**

Prerequisite: consent of the instructor. Dance in the therapeutic setting. A year course including a study of related research and literature, theoretical foundations for movement therapy, and individual research projects.  
Miss Hawkins, Mrs. Whitehouse

**Professional Courses**

**327A-327B. Principles of Teaching Dance.**

(½ course each)

Prerequisite: senior standing or consent of the instructor. A study of methods, curricular materials, and evaluation procedures as related to the teaching of dance in the secondary schools.  
Mrs. Dunin, Miss Leavitt

Individual Study and Research

**596A. Directed Individual Study or Research.**  
(½ to 2 courses)**596R. Directed Study or Research in a Hospital or Clinic.** (½ to 2 courses)**597. Preparation for the Comprehensive Examination for the Master's Degree.**  
(No credit)**598. Research for and Preparation of the Master's Thesis.** (½ to 2 courses)**ECONOMICS**

(Department Office, 2263 Bunche Hall)

Armen A. Alchian, Ph.D., *Professor of Economics.*William R. Allen, Ph.D., *Professor of Economics.*George W. Hilton, Ph.D., *Professor of Economics.*Werner Z. Hirsch, Ph.D., *Professor of Economics and Director, Institute of Government and Public Affairs.*Jack Hirshleifer, Ph.D., *Professor of Economics.*John J. McCall, Ph.D., *Professor of Economics.*Harold M. Somers, Ph.D., LL.B., *Professor of Economics.*Paul A. Dodd, Ph.D., LL.D., *Emeritus Professor of Economics.*Jacob Marschak, Ph.D., *Emeritus Professor of Economics and Business Administration.*Earl J. Miller, Ph.D., LL.D., *Emeritus Professor of Economics.*Dudley F. Pegrum, Ph.D., *Emeritus Professor of Economics.*John F. Barron, Ph.D., *Associate Professor of Economics.*Yung-Ping Chen, Ph.D., *Associate Professor of Economics.*Barry R. Chiswick, Ph.D., *Associate Professor of Economics.*H. Robert Heller, Ph.D., *Associate Professor of Economics.*Michael D. Intriligator, Ph.D., *Associate Professor of Economics.*J. Clayburn LaForce, Jr., Ph.D., *Associate Professor of Economics (Chairman of the Department)*Axel Leijonhufvud, Ph.D., *Associate Professor of Economics (Vice Chairman of the Department)*George G. S. Murphy, Ph.D., *Associate Professor of Economics.*Sam Peltzman, Ph.D., *Associate Professor of Economics.*Earl A. Thompson, Ph.D., *Associate Professor of Economics.*Sven W. Arndt, Ph.D., *Assistant Professor of Economics.*Charles W. Baird, Ph.D., *Assistant Professor of Economics.*Ronald Britto, Ph.D., *Assistant Professor of Economics.*Joseph M. Burns, Ph.D., *Assistant Professor of Economics.*Bryan C. Ellickson, Ph.D., *Assistant Professor of Economics.*William E. Gibson, Ph.D., *Assistant Professor of Economics.*Bruce Herrick, Ph.D., *Assistant Professor of Economics.*Larry J. Kimbell, Ph.D., *Assistant Professor of Economics.*Cotton M. Lindsay, Ph.D., *Assistant Professor of Economics.*Robert T. Michael, Ph.D., *Assistant Professor of Economics.*Charles T. Nisbet, Ph.D., *Assistant Professor of Economics.*Douglas D. Shetler, Ph.D., *Assistant Professor of Economics.*Benjamin Klein, A.M., *Acting Assistant Professor of Economics.*Joseph M. Ostroy, B.S., *Acting Assistant Professor of Economics.*Richard J. Sweeney, A.B., *Acting Assistant Professor of Economics.*Firouz Vakil, M.A., *Acting Assistant Professor of Economics.*Alice John Vandermeulen, Ph.D., *Senior Lecturer in Economics.*

### Objective of the Major in Economics

The requirements for and offerings in the major are intended to provide a well-rounded education based on a broad foundation of economics and related subjects, and to supply basic training for students who plan to enter high school and junior college teaching in the social sciences or business education, law, social work, or government service. The major provides training for professional graduate studies in economics and in business administration. Economics majors wishing also to obtain a business teacher's credential should see "Business Education," page 217. Upper division programs are worked out in consultation with departmental advisers.

### Preparation for the Major

Required: Economics 1 and 2; one course in calculus (e.g., Mathematics 2B, 3A, or 11A, which may be taken pass/fail); and four lower or upper division courses in the social sciences other than economics, which may be taken pass/fail. (Upon petition, a student in upper division standing may be permitted to substitute Economics 100 for Economics 1 and 2.) Those who wish additional work in economics or in closely related fields while still in lower division standing can take Economics 10 and Business Administration 1A.

### The Major

Nine upper division courses in economics, which must include (1) Economics 101A-101B, 102, (2) Economics 140 or its equivalent; and (3) at least one course in each of three fields in economics listed below other than Economics 101A, 101B, 102, and 140. Economics 100 may not be included among the nine upper division courses. One or two of the nine courses may be chosen from the following courses in the Department of Business Administration: 115A, 120, 120M and 130. A 2.0 average is required in all economics courses and in all major courses (including any in business administration). Upon consent of the instructor, students may take an upper division course for which they do not have prerequisites.

### Fields for the Major

Economic Theory (courses 101A-101B, 102, 105, 107); Economic Development (courses 108, 109, 110, 111, 112); Regional Economics (courses 120, 121, 122); Public Finance (courses 130, 132, 133); Statistics, Mathematical Economics, and Econometrics (courses 140, 141, 142, 145, 146, 147); Labor

Economics (courses 150, 151, 152); Money and Banking (courses 160, 161, 162); Government, Industry and Natural Resources (courses 170, 171, 173, 175, 178); Economic Institutions (courses 180, 181, 182, 183); International Economics (courses 190, 191, 192).

### Requirements for the M.A. Degree

Candidates for the degree of Master of Arts in economics are normally required to have completed the equivalent of an undergraduate major in economics. In addition to the general University requirements (see pages 152-153), the departmental requirements are nine upper division and graduate level courses. These must include, if not taken previously, Economics 101A-101B, 102 (or their equivalent) which must be taken (or retaken) with grade B or better; and Economics 107 (or its equivalent) passed with a grade of at least C. At least five of the nine courses must be strictly graduate courses in economics, spread over at least two "subject" fields. If the student elects to follow the examination plan rather than the thesis plan, he will be given a single four-hour written examination in his field of concentration. (Beginning with Fall Quarter 1971, the M.A. will no longer be offered on the thesis plan, nor will separate M.A. examinations be given. Candidates for the M.A. will be required to take two of the Ph.D. field exams and to achieve a Satisfactory Pass in at least one.)

With the consent of the graduate adviser, candidates may offer a maximum of two courses of acceptable upper division and/or graduate courses in other social sciences, in history, in business administration, in mathematics, in psychology, in education, or in philosophy in partial satisfaction of the requirements for the degree. This will not, however, relieve the student from taking five graduate courses in the Department of Economics.

Students are required to complete three courses in mathematics and statistics: at least one course in calculus, at least one course in statistics, and a third in either mathematics or statistics. The mathematics courses may be Economics 145 or 146 or any appropriate lower or upper division courses offered by the Department of Mathematics. Economics 140 or an equivalent introductory course in statistics should be one of the statistics courses chosen. Work in the student's prior record will be counted toward this requirement.

**Requirements for the Ph.D Degree**

*Basic Requirements.* See general University regulations, pages 156-158.

*Mathematics, Statistics, Economic History, History of Theory, and Accounting.* A quarter course or its equivalent in (a) American economic history, (b) European economic history, (c) history of economic theory. The student must have completed work in mathematics and statistics, equivalent to three quarter courses, distributed as follows: at least one in calculus, at least one in statistics, and a third in either mathematics or statistics. The mathematics courses may be Economics 145 or 146 or any appropriate lower or upper division courses offered by the Department of Mathematics. Economics 140 or an equivalent introductory course in statistics should be one of the statistics courses chosen. Work in the student's prior record will be counted toward all the above requirements. In any case, they must be completed at the earliest possible date and prior to admission to candidacy. In addition, the Ph.D. program presupposes a knowledge of elementary accounting principles.

*Language.* The student will either (a) pass examinations in two foreign languages or (b) pass one language examination and submit a mathematics substitution for the second language. The substitution will consist of three appropriate courses taken in the Department of Mathematics in addition to the courses which are used to satisfy the mathematics requirements for all candidates.

*General Qualifying Examination.* In order to gain admission to candidacy and become eligible for the Candidate in Philosophy degree, graduate students shall pass written and oral examinations. The written examinations will cover the fields of micro and macro economic theory, and three additional fields to be selected from those listed in the field offerings of the department. The student may, however, not include both Mathematical Economics and Econometrics among the four required fields. A student, upon petition, may be allowed to substitute a field outside the Department of Economics for one of his three elective fields.

The four written examinations should be taken in no more than two examination periods, the theory examination to be taken in the first such period. The oral qualifying examination will be scheduled only after the successful completion of all the written examinations and other basic requirements and on the submission of a written dissertation

proposal. The oral examination will focus on, but not be limited to, the dissertation proposal.

**Fields for Graduate Degrees**

Economic Theory (courses 201A-201B-201C., 202A-202B, 203A-203B-203C, 204, 205, 206, 207); Economic Development (211, 212, 213A-213B-213C-213D-213E); Regional Economics (221, 222); Public Finance (231, 232, 234); Mathematical Economics (245A-245B-245C); Statistics and Econometrics (247, 248, 249); Labor Economics (251, 252, 253); Money and Banking (261, 262); Government, Industry and Natural Resources (271, 272, 275, 276); Economic Institutions (281, 282, 283); International Economics (291, 292, 293).

**Lower Division Courses****1. Principles of Economics.**

(Numbered 1A in 1966-67.) Lecture, three hours; discussion, one hour. Not open to students with credit for Economics 100. An introduction to the principles of economic analysis, economic institutions, and issues of economic policy. Emphasis on allocation of resources and distribution of income through the price system. **The Staff**

**2. Principles of Economics.**

(Numbered 1B in 1966-67.) Lecture 3 hours; discussion 1 hour. Not open to students with credit for Economics 100. An introduction to the principles of economic analysis, economic institutions, and issues of economic policy. Emphasis on aggregative economics, including national income, monetary and fiscal policy, and international trade. **The Staff**

**10. Evolution of Economic Institutions in America.**

(Numbered 13 in 1966-67.) The historical development of the present American economic system and its performance over time, especially as revealed by the quantitative data of modern research. **Mr. LaForce, Mr. Murphy, Mr. Shetler**

**Upper Division Courses**

Courses 1 and 2 or 100 are prerequisite to all upper division courses in economics.

**100. Economic Principles and Problems.**

(Numbered 101 in 1966-67.) Not open to students with credit for 1 and 2. Under special circumstances an economics major in upper division standing may be permitted to substitute 100 for 1 and 2 by petition. A one-quarter course presenting the principles of economics with applications to current economic problems. **The Staff**

**101A-101B. Micro Economic Theory.**

101A. (Numbered 100A in 1966-67.) Laws of demand, supply, returns and costs; price and output determination in different market situations. **Mr. Hirschleifer, Mr. Ostroy, Mr. Thompson**

101B. (Numbered 100B in 1966-67.) Theory of factor pricing and income distribution; general equilibrium; implications of the pricing process for optimum allocation of resources; interest and capital. **Mr. Hirschleifer, Mr. Ostroy, Mr. Thompson**

**102. Macro Economic Theory.**

(Numbered 100C in 1966-67.) Theory of income and employment. Introduction to fiscal and monetary policy. Mr. Arndt, Mr. Britto, Mr. Leijonhufvud

**105. Introduction to Macrodynamics.**

(Numbered 105 and 106 in 1966-67.) Prerequisites: courses 101B, 102. A study of the problem of maintaining equilibrium in systems relying on automatic market forces. Sources of malfunctions, with emphasis on oscillatory behavior. Implications for theory of economic fluctuations. Economic applications of information theory and cybernetics. Mr. Britto, Mr. Leijonhufvud

**107. History of Economic Theory.**

(Numbered 103 in 1966-67.) A survey of economic analysis from Grecian antiquity to the early 20th century, concentrating on the 18th and 19th centuries; special attention to selected writers, including Aristotle, the Mercantilists, the Physiocrats, Hume, Smith, Malthus, Ricardo, Marx, the Marginalists, and Marshall. Mr. Allen, Mr. Baird, Mr. Peltzman

**108. Economic Demography.**

(Numbered 111 in 1966-67.) Theories of population growth and historical evidence. Secular, cyclical and cross sectional analysis of fertility. Economic analyses of migration and labor force participation. Population, human capital and economic growth. Mr. Chiswick

**109. Economics of Poverty.**

Prerequisite: course 1 or 100. Alternative conceptions and extent of poverty; economic analysis of both the causes of poverty, including discrimination, and the effects of poverty, including crime and unrest; policy implications and remedies. The Staff

**110. Economic Problems of Underdeveloped Countries.**

A survey of the major issues of development economics. Economic structure of low income countries and primary causes for their limited economic growth. Economic goals and policy alternatives open to their leaders. Possible roles of developed countries. Selected case studies. Mr. Herrick, Mr. Nisbet, Mr. Vakili

**111. Theories of Economic Growth and Development.**

(Numbered 109 in 1966-67.) Growth models, theory of production under constraints, relative factor prices and their impact on choice of technology, investment criteria, role of the market, economic planning in less developed areas. Mr. Herrick, Mr. Nisbet, Mr. Vakili

**112. Policies for Economic Development.**

(Numbered 110 in 1966-67.) Prerequisite: course 111 or 102. Suggested strategies for economic development: inflation, balanced growth, industry vs. agriculture, import substitution, export oriented expansion, foreign aid, and others will be considered. Selected case studies. Mr. Herrick, Mr. Nisbet, Mr. Vakili

**120. Regional and Urban Economics: Survey.**

Economic analysis as applied to significant, current regional and urban problems and policy. Mr. Ellickson, Mr. Hirsch

**121. Regional and Urban Economics: Resources and Location.**

(Formerly numbered 120.) Prerequisite: course 120 or 101B. Demand and supply of urban public services; transportation and location decisions and urban human resources analysis. Mr. Ellickson, Mr. Hirsch

**122. Regional and Urban Economics: Income and Growth.**

(Formerly numbered 121.) Prerequisite: course 120 or 102. Income determination, impact analysis, growth decision, and regional information systems. Mr. Ellickson, Mr. Hirsch

**130. Public Finance.**

(Formerly numbered 131.) A survey of the development and economic effects of public expenditures, revenues, and indebtedness, with reference to selected tax and budgetary problems. Mr. Chen, Mr. Lindsay, Mrs. Vandermeulen

**132. Financing Social Security and Transfer Expenditures.**

(Numbered 133 in 1966-67.) In the context of the economic behavior of the household and the performance of the economy, this course is designed to study the theories, practices, and economic effects of, and the alternatives to, such programs as OASDHI, unemployment insurance, public assistance and others. Mr. Chen

**133. State and Local Finance.**

(Numbered 132 in 1966-67.) Prerequisite: course 130. The division of functions and revenues between state and local governments; the revenues, expenditures, and indebtedness of these governments. Analyses of state and local tax systems. Mrs. Vandermeulen

**140. Introduction to Statistical Methods.**

Elements of statistical analysis. Presentation and interpretation of data; descriptive statistics; theory of probability and basic sampling distributions; statistical inference, including principles of estimation and tests of hypotheses; introduction to regression and correlation. Not open for credit to students who have completed Business Administration 115A. Mr. Arndt, Mr. McCall, Mr. Shetler

**141. Principles of Statistical Decision.**

Prerequisite: course 140 or equivalent. Errors of the first and second kind; economic loss functions; prior probabilities and Bayes' Theorem. Analysis of classical and Bayesian approaches. Application to inventory and production problems. The value of information, and implications for sampling design. Mr. Ellickson, Mr. Hirschleifer, Mr. Kimbell, Mr. McCall

**142. Quantitative Economic Analysis.**

Prerequisite: course 140 or equivalent. Advanced regression and correlation analysis, and analysis of variance; study of time series and index numbers. Emphasis on applications of statistical tools in quantitative economic analysis and on implications of quantitative knowledge on the validity of economic theory. Mr. Ellickson, Mr. Intriligator, Mr. Kimbell

**145. Introduction to Mathematical Economics.**

(Numbered 143 in 1966-67.) Prerequisite: a course in calculus. A review of calculus and differ-

ential equations, with applications to economics, specifically the theory of the household and the firm, capital theory, macroeconomic systems, and cycles and growth.

Mr. Ellickson, Mr. Intriligator, Mr. Kimbell

#### 146. Linear Models in Economics.

(Numbered 144 in 1966-67.) Prerequisite: a course in calculus. An introduction to matrices and matrix algebra, with applications to economics, specifically input-output, Markov chains and linear models of econometrics.

Mr. Ellickson, Mr. Intriligator, Mr. Kimbell

#### 147. Introduction to Econometrics.

(Numbered 145 in 1966-67.) Prerequisites: courses 145 and 146 or equivalents. An introduction to econometrics, including model building, data collection, estimation and hypothesis testing, and the use of econometric models for economic analysis and policy. Mr. Ellickson, Mr. Intriligator, Mr. Kimbell

#### 150. Wage Theory.

The supply and demand for labor. Analysis of government, union and other constraints on the competitive system of wage determination. Wage level and structure. Wages and human capital theory. Mr. Chiswick, Mr. Herrick, Mr. Michael

#### 151. Labor, Wages, and the Economy.

Prerequisite: course 150. Changes in real wages. Inflation, unemployment, distribution of income. Manpower planning. Economic security.

Mr. Chiswick, Mr. Herrick, Mr. Michael

#### 152. Economics of Trade Unions.

(Formerly numbered 151.) Prerequisite: course 150. Economic analysis of strikes, boycotts, lock-outs, right to work, seniority, work-rules, pensions, fringe benefits. The evolution of trade unions and the legislative framework within which they operate are also considered.

Mr. Chiswick, Mr. Herrick, Mr. Michael

#### 160. Money and Banking.

(Numbered 135 in 1966-67.) The principles and history of money and banking with principal reference to the experience and problems of the United States. The Staff

#### 161. Monetary Theory.

(Numbered 136 in 1966-67.) Prerequisite: course 160. The real sector of the economy in a theory of finance with emphasis on innovations in finance (including the development of money and commercial banks), the costs of finance, and economic growth and development. Mr. Burns, Mr. Gibson, Mr. Sweeney

#### 162. Monetary Policy.

Prerequisite: course 161. Techniques of monetary control; the efficacy and equity of the techniques; monetary policies in the interwar and postwar periods; proposals for improving monetary controls, in terms of both techniques employed and policies adopted. Mr. Baird, Mr. Burns, Mr. Gibson

#### 170. Economics of Industrial Control.

Economic and institutional foundations of public regulation; the pricing process and public policy; public control of competition, monopoly, transportation, and public utilities; the rationale of a private enterprise economy.

Mr. Barron, Mr. Klein, Mr. Peltzman

#### 171. Industrial Organization.

Prerequisite: course 101A. Study of the structure and operation of American industry. Topics covered: pricing and output decisions of firms under different market structures; determinants of market structure; theories of oligopoly and monopolistic competition. Empirical evidence of structure and performance of markets discussed. Mr. Klein

#### 173. Public Utilities.

(Numbered 171 in 1968-69.) The economics of public service corporations; the economic problems of regulation; state and national problems arising from the development of public utilities; public ownership.

#### 175. Economics of Transportation.

(Numbered 173 in 1966-67.) The economic characteristics of transport; the functions of the different agencies; pricing and resource allocation in transport; public regulation of transport; urban transport; the modern transport problem. Mr. Hilton

#### 178. Economics of Natural Resources.

(Numbered 176 and 177 in 1966-67.) Prerequisite: course 101B. Economic principles in the utilization of resources including water, minerals, petroleum, and land; private and social costs; cost benefit analysis; analysis of government resource policies.

#### 180. Comparative Economic Systems.

(Numbered 107 in 1966-67.) An analysis of capitalist and planned economies as exemplified by the United States, Soviet Union, Great Britain, etc. Alternative systems are compared with respect to the economic goals, theories of economic organization, institutions, and developmental processes. Problems of economic planning are emphasized.

Mr. LaForce, Mr. Murphy

#### 181. Development of Economic Institutions in Western Europe.

(Numbered 108 in 1966-67.) Rise of capitalism in Western Europe, with emphasis on its basic institutions, such as private property, profit motive, price system; comparative rates of growth of different countries; protestantism and capitalism; critical evaluation of the concept of the Industrial Revolution. Mr. LaForce

#### 182. Economic Problems of the U.S.S.R.

(Numbered 112 in 1966-67.) An introduction to the organization and policies of the economy of the U.S.S.R. Mr. Murphy

#### 183. Development of Economic Institutions in the United States.

A study of the changing economic conditions in the U.S. from colonial times to the early 20th century and the effects of these changes on American society. Mr. Murphy, Mr. Shetler

#### 190. International Economics.

(Numbered 195 in 1966-67.) A general introduction to international economics, based upon an examination of the theory of trade and the means and significance of balance of payments adjustments, with analysis of major issues of international commercial and monetary policy confronting national and international agencies.

Mr. Allen, Mr. Arndt, Mr. Heller



**191. International Trade Theory.**

Prerequisite: course 101B. The theory of international trade. Determination of the direction of trade, international prices, and quantities of commodities traded. The effects of tariffs, quotas, customs unions, and common markets. The effects of free and restricted trade on economic welfare.

Mr. Arndt, Mr. Heller, Mr. Sweeney

**192. International Finance.**

(Numbered 196 in 1966-67.) Prerequisite: course 102. Emphasis on interpretation of the balance of payments and the adjustment to national and international equilibria, through changes in price levels, exchange rates, and national income. Other topics include: making international payments, determination of exchange rates under various monetary standards, capital movements, exchange controls, and international monetary organization.

Mr. Allen, Mr. Arndt, Mr. Heller

**199. Special Studies in Economics. (½ to 1 course)**

Prerequisite: senior standing and consent of the instructor. A student may count this course only once in satisfying his major in economics; he may take it a second time to meet University graduation requirements.

**Graduate Courses****201A. Theory of Consumption and Exchange.**

Mr. Alchian, Mr. Hirschleifer

**201B. Theory of Production and Distribution.**

Mr. Alchian, Mr. Hirschleifer, Mr. McCall

**201C. Theory of Interest and Capital.**

Mr. Alchian, Mr. Hirschleifer, Mr. Leijonhufvud

**202A-202B. Income, Employment, and Monetary Theory.**

(Formerly numbered 201C and 202.)

Mr. Gibson, Mr. Leijonhufvud, Mr. Thompson

**203A. Economics of Decision.**

(Same as Business Administration 203A.) Prerequisite: Economics 101B, 102, 140 and calculus.

Mr. Marschak

**203B. Economics of Information.**

(Same as Business Administration 203B.) Prerequisite: Economics 101B, 102, 140 and calculus.

Mr. Marschak

**203C. Economics of Organization.**

(Same as Business Administration 203C.) Prerequisite: Economics 203A-B.

Mr. Marschak

**204. Applications of Economic Theory.**

(Numbered 253 in 1966-67.) The Staff

**205. Fluctuations and Growth: Measurement and Theory.**

(Numbered 254A in 1966-67.) Mr. Britto, Mr. Thompson

**206. Fluctuations and Growth: Analysis of the U. S. Record.**

(Numbered 254B in 1966-67.) Mr. Britto, Mr. Thompson

**207. History of Economic Theory.**

(Numbered 250 in 1966-67.) Mr. Allen, Mr. Baird

**211. Economic Growth of Underdeveloped Areas: Theory and Structure.**

(Numbered 268A in 1966-67.) Mr. Herrick, Mr. Nisbet, Mr. Vakil

**212. Economic Growth of Underdeveloped Areas: Models and Policy.**

(Numbered 268B in 1966-67.) Mr. Herrick, Mr. Nisbet, Mr. Vakil

**213A-213E. Selected Problems of Economic Development.**

213A. Selected Problems of Underdeveloped Areas.

213B. Selected Problems of Underdeveloped Areas: Economic and Political Change.

213C. Selected Problems of Underdeveloped Areas: Africa.

213D. Selected Problems of Underdeveloped Areas: Latin America.

213E. Selected Problems of Underdeveloped Areas: Demography and Economic Development.

Mr. Herrick, Mr. Nisbet, Mr. Vakil

**221. Urban and Regional Economic Analysis I.**

(Numbered 220A in 1966-67.) Mr. Ellickson, Mr. Hirsch

**222. Urban and Regional Economic Analysis II.**

(Numbered 220B in 1966-67.) Mr. Ellickson, Mr. Hirsch

**231. Public Finance.**

(Numbered 261 in 1966-67.) Mr. Chen, Mr. Somers

**232. Economics of Government Expenditures.**

Mr. Chen

**234. Economics of Federalism.**

Mr. Thompson

**245A-245B-245C. Mathematical Economics.**

(Formerly numbered 245.) Mr. Intriligator

**247. Econometrics I.**

(Numbered 242A in 1966-67.) Mr. Intriligator, Mr. Kimbell, Mr. McCall

**248. Econometrics II.**

(Numbered 242B in 1966-67.) Mr. Intriligator, Mr. Kimbell, Mr. McCall

**249. Econometrics III.**

(Numbered 242C in 1966-67.) Mr. Intriligator, Mr. Kimbell, Mr. McCall

**251. Labor Economics I.**

(Numbered 270A in 1966-67.) Mr. Chiswick, Mr. Herrick, Mr. Michael

**252. Labor Economics II.**

(Numbered 270B in 1966-67.) Mr. Chiswick, Mr. Herrick, Mr. Michael

**253. Labor Problems.**

(Numbered 271 and 272 in 1966-67.) Mr. Herrick

- 261. Monetary Economics I.**  
Mr. Burns, Mr. Gibson, Mr. Thompson
- 262. Monetary Economics II.**  
(Numbered 258 in 1966-1967.)  
Mr. Burns, Mr. Gibson, Mr. Thompson
- 271. Industrial Organization, Price Policies, and Regulation: Theory.**  
(Numbered 260A in 1966-67.)  
Mr. Klein, Mr. Peltzman
- 272. Industrial Organization, Price Policies, and Regulation: Policy.**  
(Numbered 260B in 1966-67.) Mr. Peltzman
- 275. National Transport Policy.**  
(Numbered 265 in 1966-67.) Mr. Hilton
- 276. Urban Transportation.** Mr. Hilton
- 281. Evolution of Economic Institutions in Western Europe.**  
(Numbered 263 in 1966-67.) Mr. LaForce
- 282. Soviet Economic Theory and Organization.**  
(Numbered 212 in 1966-67.) Mr. Murphy
- 283. Evolution of Economic Institutions in the United States.**  
(Numbered 262 in 1966-67.)  
Mr. Murphy, Mr. Shetler
- 291. International Trade Theory.**  
(Numbered 266A in 1966-67.)  
Mr. Arndt, Mr. Heller
- 292. International Finance.**  
(Numbered 266B in 1966-67.)  
Mr. Allen, Mr. Arndt, Mr. Heller
- 293. International Economics: Selected Topics.**  
(Numbered 267 in 1966-67.)  
Mr. Allen, Mr. Arndt, Mr. Heller
- Individual Study and Research
- 596. Individual Study. (½ to 2 courses)**  
Directed individual study or research. The Staff
- 597. Individual Study: Graduate Examinations.**  
(½ to 2 courses)  
Directed individual study in preparation for the M.A. comprehensive examination or the Ph.D. qualifying examination. The Staff
- 598. Individual Research: M.A. Thesis.**  
(½ to 2 courses)  
Directed individual research in preparation of M.A. thesis. The Staff
- 599. Individual Research: Ph.D. Dissertation.**  
(½ to 2 courses)  
Directed individual research in preparation of Ph.D. dissertation. The Staff

## ■ EDUCATION

(Department Office, 244 Moore Hall)

- Melvin L. Barlow, Ed.D., *Professor of Education and Director of the Division of Vocational Education.*
- James C. Coleman, Ph.D., *Professor of Education and Psychology.*
- Wilbur H. Dutton, Ed.D., *Professor of Education (Vice-Chairman of the Department).*
- Claude W. Fawcett, Ph.D., *Professor of Education.*
- Clarence Fielstra, Ph.D., *Professor of Education.*
- John I. Goodlad, Ph.D., L.H.D., *Professor of Education and Director of University Elementary School.*
- C. Wayne Gordon, Ph.D., *Professor of Education and Sociology (Chairman of the Department).*
- B. Lamar Johnson, Ph.D., *Professor of Education.*
- Evan R. Keislar, Ph.D., *Professor of Education.*
- George F. Kneller, Ph.D., Litt.D., LL.D., *Professor of Education.*
- Erick L. Lindman, Ph.D., *Professor of Education.*
- William H. Lucio, Ph.D., *Professor of Education.*
- John D. McNeil, Ed.D., *Professor of Education and Head of Supervised Teaching.*
- Lynne C. Monroe, Ed.D., *Professor of Education.*
- C. Robert Pace, Ph.D., *Professor of Education.*
- Rosemary Park, Ph.D., *Professor of Education.*
- May V. Seagoe, Ph.D., *Professor of Education.*
- Paul H. Sheats, Ph.D., LL.D., *Professor of Education.*
- A. Garth Sorenson, Ph.D., *Professor of Education.*
- Lawrence E. Vredevoe, Ph.D., *Professor of Education.*
- Samuel J. Wanous, Ph.D., *Professor of Education.*

Charles Z. Wilson, Ph.D., *Professor of Education.*  
 Merlin C. Wittrock, Ph.D., *Professor of Education.*  
 Jesse A. Bond, Ed.D., *Emeritus Professor of Education.*  
 William S. Briscoe, Ed.D., *Emeritus Professor of Education.*  
 Watson Dickerman, Ph.D., *Emeritus Professor of Education.*  
 John A. Hockett, Ph.D., *Emeritus Professor of Education.*  
 David F. Jackey, Ph.D., *Emeritus Professor of Education.*  
 Dorothy M. Leahy, Ed.D., *Emeritus Professor of Education.*  
 Malcolm S. MacLean, Ph.D., *Emeritus Professor of Education.*  
 F. Dean McClusky, Ph.D., *Emeritus Professor of Education.*  
 Lloyd N. Morrisett, Ph.D., *Emeritus Professor of Education.*  
 Frances M. Obst, Ed.D., *Emeritus Professor of Education.*  
 Lorraine M. Sherer, Ed.D., *Emeritus Professor of Education.*  
 J. Harold Williams, Ph.D., *Emeritus Professor of Education.*  
 Frederic P. Woellner, Ph.D., Litt.D., LL.D., *Emeritus Professor of Education.*  
 Marvin C. Alkin, Ed.D., *Associate Professor of Education.*  
 Sol Cohen, Ph.D., *Associate Professor of Education.*  
 Charlotte Crabtree, Ph.D., *Associate Professor of Education.*  
 Lawrence W. Erickson, Ed.D., *Associate Professor of Education.*  
 Norma J. Feshbach, Ph.D., *Associate Professor of Education.*  
 Frank M. Hewett, Ph.D., *Associate Professor of Education and Psychiatry.*  
 Wendell P. Jones, Ph.D., *Associate Professor of Education.*  
 Frederick C. Kintzer, Ed.D., *Associate Professor of Education.*  
 W. James Popham, Ed.D., *Associate Professor of Education.*  
 Rodney W. Skager, Ph.D., *Associate Professor of Education.*  
 James W. Trent, Ph.D., *Associate Professor of Education.*  
 Louise L. Tyler, Ph.D., *Associate Professor of Education.*  
 Carl Weinberg, Ed.D., *Associate Professor of Education.*  
 Eva L. Baker, Ed.D., *Assistant Professor of Education.*  
 Clarence H. Bradford, Ph.D., *Assistant Professor of Education.*  
 James E. Bruno, Ph.D., *Assistant Professor of Education.*  
 Webster R. Callaway, Ph.D., *Assistant Professor of Education.*  
 Arthur M. Cohen, Ph.D., *Assistant Professor of Education.*  
 Diana M. Drake, Ed.D., *Assistant Professor of Education.*  
 James A. Farmer, Ed.D., *Assistant Professor of Education.*  
 Gary D. Fenstermacher, Ph.D., *Assistant Professor of Education.*  
 Simon Gonzales, Ed.D., *Assistant Professor of Education.*  
 Charles C. Healy, Ph.D., *Assistant Professor of Education.*  
 Barbara K. Keogh, Ph.D., *Assistant Professor of Education.*  
 John R. Kershner, Ph.D., *Assistant Professor of Education.*  
 Marilyn H. Kourilsky, Ph.D., *Assistant Professor of Education.*  
 Thomas J. La Belle, Ph.D., *Assistant Professor of Education.*  
 Philip A. Reidford, Ph.D., *Assistant Professor of Education.*  
 Judith Ramirez, Ph.D., *Assistant Professor of Education.*  
 Bruce A. Reinhart, Ph.D., *Assistant Professor of Education.*  
 Thomas G. Robischon, Ph.D., *Assistant Professor of Education.*  
 Val Rust, Ph.D., *Assistant Professor of Education.*  
 Jay D. Scribner, Ed.D., *Assistant Professor of Education.*  
 Merron S. Seron, Ph.D., *Assistant Professor of Education.*  
 Cornelius J. Troost, Ed.D., *Assistant Professor of Education.*  
 Richard C. Williams, Ph.D., *Assistant Professor of Education.*  
 James Yelvington, Ph.D., *Assistant Professor of Education.*

David Allen, Ed.D., *Lecturer in Education.*  
 Byron H. Atkinson, Ed.D., *Lecturer in Education.*  
 Steven Forness, Ed.D., *Lecturer in Education.*  
 Shirley Hansen, Ed.D., *Lecturer in Education.*  
 Allen Hogle, Ph.D., *Lecturer in Education.*  
 James W. Keesling, M.A., *Acting Assistant Professor of Education.*  
 Robert Kindred, Ed.D., *Lecturer in Education.*  
 Donald Layton, M.Ed., *Acting Assistant Professor of Education.*  
 Jerrold Novotney, Ed.D., *Specialist in Education.*  
 David O'Shea, M.A., *Acting Assistant Professor of Education and Sociology.*  
 Jack B. Share, M.A., *Acting Assistant Professor of Education.*  
 William L. Speizman, B.A., *Acting Assistant Professor of Education.*

#### Upper Division Courses†

Junior standing is prerequisite to all courses in Education except course 100, which is open to high sophomores.

#### 100. Cultural Foundations of Education.

Uses source materials from the humanities and the social sciences to examine the problems of education today. Special emphasis is placed on the nature and aims of education within a context of contemporary social issues.

Mr. Fenstermacher, Mr. Kneller and Staff

#### 101. Education in Black and White.

Provide teachers and prospective teachers with an opportunity to understand the unique problems of being black in urban America.

Mr. Weinberg and Staff

#### 102. Education of the Mexican-American Child.

Help prospective teachers acquire an understanding of the social values and ethnic characteristics of people of Mexican descent residing in the United States.

Mr. Gonzalez

#### 108. Sociology of Education.

(Same as Sociology 143.) Prerequisite: Sociology 1A or 101. Study of social processes and interaction patterns in educational organizations; the relationship of such organizations to aspects of society, social class and power; social relations within the school, college and university; formal and informal groups, subcultures in educational systems; roles of teachers, students and administrators.

Mr. O'Shea, Mr. Speizman, Mr. Weinberg

#### 112. Psychological Foundations of Education.

(Formerly numbered 110A-110B.) Prerequisite: Psychology 10 or equivalent. The learning process in school situations, the evaluation of learning, the development of motor and intellectual abilities, and social and personal development of children in relation to the school; educational measurement and the interpretation of research.

Miss Drake, Mr. Keislar, Mr. Reidford

#### 116. The Education of Exceptional Children.

Two class hours, four hours field work. Prerequisites: Psychology 10 and 12 or 101; limited to graduate students and qualified seniors. The characteristics of educational provisions for exceptional children, including the mentally and physically handicapped, the gifted, the emotionally disturbed, and the socially disadvantaged.

Mr. Hewett and Staff

#### 124A-124B-124C. Curriculum in Elementary Schools.

##### 124A. The Elementary Curriculum: Social Studies.

Prerequisite: must be taken concurrently with Education 112. Critical examination of the elementary school curriculum; principles and methods in developing instructional programs in social studies; participation in schools; two hour laboratory by arrangement.

Miss Crabtree, Mrs. Ramirez

##### 124B. The Elementary Curriculum: Language Arts and Reading.

Prerequisites: courses 112 and 124A. Principles and methods in developing instructional programs in language arts and reading; participation in schools; two hour laboratory by arrangement.

##### 124C. The Elementary Curriculum: Mathematics and Science.

(Formerly numbered 124B.) Prerequisites: Education 124A and Mathematics 38. Principles and methods in developing instructional programs in mathematics and science; participation in schools; two hour laboratory by arrangement.

Mr. Dutton, Mr. Troost

#### 128A-128E. Programs for the Education of Exceptional Children.

##### 128A. The Mentally Retarded in School and Community.

Prerequisite: course 116; limited to graduates and qualified seniors. Etiology of mental retardation; identification; sociological implications; social-vocational adjustment; counseling; community resources; educational and legal provisions.

Mr. Kershner

##### 128B. Programs for the Educable Mentally Retarded.

Prerequisite: course 128A; limited to graduates and qualified seniors. Developmental and learning needs of the educable mentally retarded; curriculum, procedures and materials; observation and participation in programs.

Mr. Kershner

##### 128C. Programs for the Severely Mentally Retarded.

Prerequisite: course 128A; limited to graduates and qualified seniors. Developmental and learning needs of the severely mentally retarded; curriculum, procedures and materials; observation and participation in programs.

Mr. Kershner

##### 128D. Programs for the Educationally Handicapped.

Two class hours, four hours field work. Pre-

† All courses four class hours except where otherwise indicated.

requisite: course 116; limited to graduates and qualified seniors. Developmental and learning needs of emotionally disturbed and minimally neurologically impaired children; curriculum, procedures and materials; observation and participation at the Neuropsychiatric Hospital.

Mr. Hewett, Mrs. Keogh

**128E. Programs for the Gifted.**

Prerequisite: course 116; limited to graduates and qualified seniors. Developmental and learning needs of gifted children; curriculum, procedures and materials; observation and participation in programs.

Mr. Callaway

**130. Curriculum and Instruction in Secondary Schools.**

Analysis of curricular and instructional procedures, observation, and participation in secondary schools.

Mrs. Baker, Mr. Popham

**137A-137B-137C. Business Education.**

**137A. The Curriculum in Business Education.**

(Formerly numbered 137.) The curriculum in business education in secondary schools, including instructional techniques, course content, prognosis of achievement, standards, error analyses, transfer of training, remedial techniques, and evaluation.

Mr. Erickson

**137B. The Teaching of Secretarial Subjects.**

(Formerly numbered 370A and 370D.) A survey and evaluation of procedures and materials used in teaching typewriting, secretarial subjects, office practice and business machines.

Mr. Erickson

**137C. The Teaching of Bookkeeping, General Business, and Economics.**

(Formerly numbered 370B-370C.) A survey and evaluation of the procedures and materials used in teaching bookkeeping, general business, and economics in secondary schools.

Mr. Erickson

**199. Special Studies. (½ to 2 courses)**

Prerequisites: senior standing and consent of the instructor. Independent study of individual problems.

The Staff

**Graduate Courses‡**

**200A-200B-200C. Research Method in the Cultural Foundations of Education.**

**200A. Historical Research and Writing.**

Technique of historical research, independent investigation, and writing on selected topics. For all students planning to pursue nonstatistical research.

Mr. S. Cohen

**200B. Survey Research Methods in Education.**

(Formerly numbered 200A.) Prerequisite: course 210A or the equivalent. Problems of conceptualization, organization and gathering non-experimental and quasi-experimental quantitative data.

Mr. O'Shea, Mr. Weinberg

**200C. Analysis of Survey Data in Education.**

Three class hours, two hours laboratory. Prerequisite: course 200B. Introduction to techniques of processing and analyzing non-experimental and quasi-experimental quantitative data.

Mr. Bradford

**201A-201B-201C. History of Education.**

**201A. History of Western Education.**

(Same course as History 215A.) The rise of the Western educational tradition; major ideas, in-

stitutions, personalities. From the world of the Greeks to that of the Twentieth Century.

Mr. S. Cohen

**201B. History of American Education to 1860.**

(Same course as History 215B.) Development of American education from the 17th Century to the Civil War. The emergence of the public school system in the context of social, intellectual and political change.

Mr. S. Cohen

**201C. History of American Education, 1860 to the Present.**

(Same course as History 215C.) Emphasis on problems of urbanization, industrialization, immigration and public school reform; contemporary school reform movements in context of social change.

Mr. S. Cohen

**203. Anthropology and Education.**

Prerequisite: Anthropology 22 recommended. Study of education through the research and method of the cultural anthropologist. Interdependence of culture and education with emphasis on cross-cultural studies of personality, enculturation, values, peer and folk culture, culture change, and normative culture.

Mr. La Belle

**204A-204E. Comparative Education.**

**204A. Comparative Education.**

(Formerly numbered 104 and 204A-204B.) Analysis of the educational systems of representative developed and emerging nations in relation to national cultures and characteristics; consideration of the problems of educational borrowing and adaptation among nations.

Mr. W. Jones

**204B. African Education.**

(Formerly numbered 253C-253D.) Prerequisite: course 204A. Historical development and comparative analysis of educational policies and practices in sub-Saharan Africa with special attention to the impact of social, political, and economic factors.

Mr. W. Jones

**204C. Asian Education.**

(Formerly numbered 253F.) Prerequisite: course 204A. Analysis of recent developments in education in South and East Asia as they are influenced by political, economic and cultural changes.

**204D. Latin American Education.**

(Formerly numbered 253E.) Prerequisite: course 204A. Status of education in relation to historical, social, political and economic factors; the educational programs of the Organization of American States and UNESCO in Latin America.

**204E. Contemporary European Education.**

Prerequisite: course 204A. Analysis of Educational institutions, practices and problems in Europe, viewed against the backdrop of their traditional cultures as well as crosscultural relationships.

Mr. Rust

**206A-206E. Philosophy of Education.**

A comprehensive introduction to the entire field: systematic philosophy, including theories of knowledge, value, and ethics; existentialism; and analytic philosophy, including the logic and language of educational thought and practice.

**206A. Philosophy of Education.**

Mr. Kneller

**206B. Existentialism.**

Mr. Kneller

**206C. Logic and Language.**

Mr. Fenstermacher

**206D. Ethics and Values.**

Mr. Robischon

**206E. Selected Classics.**

The Staff

‡ Open only to students in graduate status. Consent of the instructor is required. All courses four class hours except where otherwise indicated.

**207. Economics and Education.**

Analysis of the relationship between investment in education and the development of human resources.

**208A-208B. Sociology of Education.****208A. The Organization of Education.**

Prerequisite: course 108. Analysis of the social and cultural systems of education; emphasis on the classroom and its environment; large organizational units and their relationships to societies.

Mr. Gordon, Mr. O'Shea, Mr. Speitzman

**208B. Sociological Paradigms in Education.**

Prerequisite: course 108 or equivalent. The adaptation of sociological paradigms to the analysis of educational systems. Models, typologies and conceptual systems on the subject of formal and informal organization, social disorganization, system functions, social change, role conflict, and the interaction of institutions are considered.

Mr. Weinberg

**209A-209B. Junior College and Higher Education.****209A. The Junior College.**

Study of the history and role of the junior college, and of problems and issues in junior college education.

Mr. Yelvington

**209B. Higher Education in the United States.**

An examination and appraisal of the scope and diversity of higher education; varieties of students, institutions, purposes, and programs; trends and current issues.

Mr. Pace

**210A-210B-210C. Educational Research and Experimental Design.****210A. Analysis of Educational Research Data.**

(Formerly numbered 114 and 200A-200B.) Basic inferential and descriptive statistics; design of simple educational experiments.

Mr. Bradford, Mr. Keesling, Mr. Skager

**210B. Experimental Design in Educational Research.**

(Formerly numbered 200A-200B.) Prerequisite: course 210A or placement examination. Analysis of variance and least square regression analysis in educational research; use of factorial designs, Latin squares, and multiple comparisons in educational experiments.

Mr. Bradford, Mr. Keesling, Mr. Skager

**210C. Experimental Design: Advanced Topics.**

(Formerly numbered 200A-200B.) Prerequisite: course 210B. Basic matrix algebra, orthogonality, confounding, fractional replication, incomplete block designs and introduction to multivariate analysis; emphasis on implications for educational research.

Mr. Bradford, Mr. Keesling, Mr. Skager

**211A-211B-211C. Measurement in Education.****211A. The Measurement of Educational Achievement and Aptitude.**

(Formerly numbered 119.) Two class hours, 4 hours laboratory. Prerequisite: course 210A. A critical study of tests of achievement and aptitude with an emphasis on group tests; the relation of achievement to aptitude and personality; elements of validity of reliability.

Mr. Keesling

**211B. Measurement in Education: Underlying Theory.**

(Formerly numbered 214A-214B.) Prerequisite: course 211A. Measurement theory as applied to testing, including classical test theory and other approaches to the nature of testing; implications

of theories for test construction and selection; current status of validity and reliability theory.

Mr. Keesling

**211C. Measurement in Education: Special Problems and Techniques.**

(Formerly numbered 214A-214B.) Two class hours, four hours laboratory. Prerequisite: course 211B. Introduction to special techniques and problems in measurement, including Q-methodology, the semantic differential, Cloze procedure, cross-cultural measurement problems, item analysis, pattern analysis, Guttman scaling and response sets.

Mr. Skager

**212A-212B-212C. Learning and Education.****212A. Learning and Education.**

(Formerly numbered 210, 211 and 212.) A review of the literature on school learning, and the development of intellectual abilities in relation to instructional procedures.

Miss Drake, Mr. Reidford

**212B. The Teaching of Concepts.**

(Numbered 212C in 1966-1967.) Prerequisites: course 210A and Psychology 112C. A critical review of the literature on the learning of concepts and of hierarchically ordered subject matter with emphasis on the stimulus variables involved in teaching.

Mr. Wittrock

**212C. The Teaching of Problem Solving Abilities.**

(Numbered 212D in 1966-1967.) Prerequisite: course 212B. A critical review of the literature on the cultivation of problem solving abilities, including learning how to learn, remote transfer, savings and creativity.

Mr. Skager, Mr. Wittrock

**213A-213B-213C. Pupil Personnel Services.****213A. Fundamentals of Student Personnel Work.**

(Formerly numbered 215A.) The formulation of objectives, analysis of ways of implementing guidance programs, and evaluation of the outcomes; emphasis on congruence between objectives, implementation, and evaluation.

Mr. Healy, Mr. Seron

**213B. Legal and Ethical Bases of Student Personnel Work.**

(Formerly numbered 215B.) Prerequisite: course 213A. Ethical and legal codes relevant to pupil personnel services; relation of value systems and personality; case studies in the implications of personal values in counseling situations.

Mr. Healy, Mr. Seron

**213C. Group Process in Education.**

(Formerly numbered 258C.) Group productivity, leadership, social perception and attitude formation, decision-making, determination of group interaction variables and the effect of behavior changes in individuals and groups.

Mr. Healy, Mr. Seron

**214A-214B. Counseling Theory and Practice.**

(Formerly numbered 258A-258B.) Prerequisite: limited to candidates for advanced degrees whose major interest is counseling, and to selected high school and college counselors. Counseling procedures, educational planning, and methods for helping students handle personal problems that interfere with school progress; critical evaluation of procedures.

Mr. Sorenson

**214C. Principles of Career Planning.**

(Formerly numbered 217.) Prerequisite: courses 112, 211A and 415A. The use of tests and occupational information in helping students in educational and vocational planning.

Mr. Barlow

**214D. Vocational Guidance.**

Prerequisite: course 214C. Depth study of current interests and needs in vocational guidance; principles, problems, and practices of vocational guidance. Mr. Reinhart

**215. Sociology of Counseling and Guidance.**

The role of the counselor in a social system. The social world of education with emphasis on problems and conflicts. The counselor's function in social reconstruction and clinical sociology. Mr. Weinberg

**217A-217B-217C. Development and Personality in the Educational Process.**

**217A.** Child Development and the Educational Process.

Prerequisite: 212A or equivalent. Biological and familial, school, and other cultural influences on the child; development of the child in the context of current research and theoretical models; relationship between personality factors and cognitive functions in school settings. Miss Drake, Mrs. Feshbach

**217B.** Intellectual Development and School Performance.

Prerequisite: 210A or equivalent; 211B recommended. Individual differences including birth order, sensory stimulation and deprivation, sex, race and social class in relation to intellectual functioning, school achievement and aptitudes. Mrs. Feshbach

**217C.** Personality Development and Motivation in Education.

(Numbered 112B 1966-1967) Personality development and environmental conditions which form motivational patterns; anxiety, dependency, perception, creativity, attitude formation and the self; research and personality theory bearing on motivational problems in school settings. Miss Drake, Mrs. Feshbach

**228A-228E. Research on the Education of Exceptional Children.**

**228A.** Research on the Education of Exceptional Children.

Prerequisite: course 116. Historical-social origins and current social trends affecting the education of the exceptional; analysis of major research on educational programs, with emphasis on the physically handicapped. Mrs. Keogh

**228B.** Research on the Education of the Mentally Retarded.

(Formerly numbered 228.) Prerequisite: course 116; 128A recommended. Intensive study of current research in biology, psychology and sociology related to mental retardation; experimental programs; parent and community problems. Mr. Kershner, Mr. Share

**228C.** Research on the Education of the Educationally Handicapped.

Prerequisite: course 116; 128D recommended. Intensive study of current research on the emotionally disturbed and minimally neurologically impaired; experimental programs; parent and community problems. Mr. Hewett, Mrs. Keogh

**228D.** Research on the Education of the Gifted.

Prerequisite: course 116; 128E recommended. Intensive study of current research on the gifted, the talented and the creative; experimental programs; parent and community problems. Mr. Callaway

**228E.** Medical-Biological Aspects of Mental Retardation.

Prerequisite: courses 228A and 228B. Multidisciplinary contributions of medicine, pediatrics, neurology, biochemistry, and psychiatry to the study of mental retardation and implications for special education. Guest participation by faculty members of the UCLA Center for Health Sciences of the Mental Retardation Program of the Neuropsychiatric Institute. Mr. Share

**229A-229B-229C. Problems in the Education of the Exceptional.**

**229A.** Problems in the Education of the Mentally Retarded.

Two class hours, four hours laboratory. Prerequisite: course 228B. Individual research and participation in school programs for the mentally retarded. Mr. Kershner, Mr. Share

**229B.** Problems in the Education of the Educationally Handicapped.

Two class hours, four hours laboratory. Prerequisite: course 228C. Individual research and participation in school programs for the emotionally disturbed and minimally neurologically impaired. Mr. Hewett

**229C.** Problems in the Education of the Gifted.

Two class hours, four hours laboratory. Prerequisite: course 228D. Individual research and participation in school programs for the gifted. Mr. Callaway

**232A-232C. Adult Education.**

**232A.** Overview and Orientation.

Overview of the field, historical development, and agencies and clientele. Mr. Farmer, Mr. Sheats

**232B.** Problems and Issues.

Current problems and issues, including impact of new federal subsidies on adult education policies and programming. Mr. Farmer, Mr. Sheats

**232C.** Instructional Procedures and Group Process.

Study of instructional procedures, course planning and materials in adult education with emphasis on improvement of teaching and group process. Mr. Farmer

**233. Principles of Adult, Vocational, and Technical Education.**

Prerequisite: consent of the instructor. Foundations of adult, vocational and technical education in the context of the changing nature of educational, technological, and manpower conditions. Mr. Barlow

**240A-240H. Administrative Cere.**

**240A.** Basic Theory and Inquiry.

Two class hours, four hours extensive individual reading. Principles of administration applied to the organization and management of schools including systematic approaches to executive training. Emphasis placed on: (a) individualized readings, exercises, and examination in cognate fields, and (b) theoretical aspects of administration. Mr. Lucio

**240B.** Governance and Politics of Education.

Prerequisite: course 240A or consent of instructor. Analysis of the organization of public education in the United States, the relationship of the structure of public education to the political processes involved in the educational policies and decisions allocated to society, and contemporary intergovernmental and political issues in education. Mr. Layton, Mr. Lindman, Mr. Scribner

- 240C. School Personnel Administration.**  
(Formerly numbered 244A-244B.) Prerequisite: course 240A or consent of instructor. The formulation and execution of personnel policies from both the organizational and individual basis.  
Mr. Fawcett, Mr. Williams
- 240D. School Finance.**  
Prerequisite: course 240A or consent of the instructor. Historical and theoretical background of educational finance: considers principles related to federal and state participation in educational finance; considers other economic factors related to the provision and utilization of financial resources in schools.  
Mr. Alkin, Mr. Lindman
- 240E. Instructional Design and Supervision.**  
(Formerly numbered 241A-241B-241C.) Prerequisite: course 240A or consent of instructor. Administrative-supervisory aspects of curriculum design and planning; school learning; program evaluation; and in-service training.  
Mr. Fielstra
- 240F. Legal Bases of Education.**  
Prerequisite: course 240A. Theory of laws relating to education; specific laws, court decisions, and legal procedures relating to schools, colleges, and universities.  
Mr. Layton, Mr. Williams
- 240G. Communication in Educational Organizations.**  
Prerequisite: course 240A. Communication theory and its application to administrative problems; includes internal communications among board members and among superintendent and staff, and external communication with the community.  
Mr. Fawcett
- 240H. Information and Planning Systems in Education.**  
Design of management information systems in educational organizations; procedures for organizational research and system analysis in educational systems.  
Mr. Bruno
- 250. Seminar: History of Education.**  
(Same as History 287.) Mr. S. Cohen
- 251A-251E. Seminars: Philosophy of Education.**
- 251A. Problems of Knowledge.** Mr. Fenstermacher
- 251B. Problems in Behavioral Science.** Mr. Fenstermacher
- 251C. Problems in Analysis.** Mr. Fenstermacher
- 251D. Ethics and Value.** Mr. Robischon
- 251E. Selected Issues.** The Staff
- 252A-252B. Seminars: Sociology of Education.**
- 252A. Educational Organizations.** Mr. Gordon, Mr. O'Shea
- 252B. Education and Social Change.** Mr. Robischon, Mr. Weinberg
- 253A-253E. Seminars: Comparative Education.**
- 253A. Current Problems in Comparative Education.** (Formerly numbered 253A-253B.) Prerequisite: course 204A. Mr. W. Jones
- 253B. African Education.** (Formerly numbered 253C-253D.) Prerequisite: course 204B. Mr. W. Jones
- 253C. Asian Education.** (Formerly numbered 253F.) Prerequisite: course 204C.
- 253D. Latin American Education.** (Formerly numbered 253E.) Prerequisite: course 204D.
- 253E. European Education.** Prerequisite: course 204E. Mr. Rust
- 255. Seminar: Special Topics in Measurement and Research Design.**  
(Formerly numbered 256A-256B.) Prerequisites: courses 210C and 211C or consent of the instructor.  
Mr. Keesling, Mr. Skager
- 256. Seminar: Special Topics in School Learning and Development.**  
(Formerly numbered 255A-255B.) Prerequisite: consent of the instructor.  
Mrs. Feahbach, Mr. Keislar, Mr. Wittrock
- 257. Seminar: Pupil Personnel Services.**  
(Formerly numbered 258A-258B.) Mr. Sorenson
- 258A-258B. Seminars: Instructional Research and Development.**
- 258A. Problems in Instructional Research.** (Formerly numbered 257A-257B.) Mr. Keislar, Mr. Wittrock
- 258B. Problems in Programmed Instruction.** (Formerly numbered 257C-257D.) Mr. Keislar
- 259. Seminar: Social Psychological Research in Higher Education.**  
(Formerly numbered 259B-259C.) Mr. Pace, Mr. Trent
- 260. Seminar: Principles of Curriculum and Instruction.**  
Mr. Goodlad, Mr. McNeil, Mrs. Tyler
- 261A-261G. Seminars: Levels of Education.**
- 261A. Early Childhood Education.** (Formerly numbered 261A-261B.) Prerequisite: courses 421A-421B. Mrs. Ramirez
- 261B. Elementary Education.** (Formerly numbered 262A-262B.) Mr. Dutton
- 261C. Secondary Education.** Mr. Vredevoe  
(Formerly numbered 263 and 280A-280B.)
- 261D. The Junior College Curriculum.** (Formerly numbered 264A-264B.) Mr. Johnson, Mr. Yelvington
- 261E. Technical Education in the Junior College.** (Formerly numbered 264C-264D.) Mr. Barlow
- 261F. Higher Education.** (Formerly numbered 254A.) Mr. Pace, Mr. Trent
- 261G. Research in Adult, Vocational and Technical Education.** Mr. Farmer and Staff
- 262A-262J. Seminars: Teaching Fields.**
- 262A. The Social Studies.** Miss Crabtree  
(Formerly numbered 262A-262B.)
- 262B. Reading.** (Formerly numbered 262A-262B.)
- 262C. Mathematics.** Mr. Dutton  
(Formerly numbered 262A-262B.)
- 262D. Language Arts and English.** (Formerly numbered 262A-262B.)
- 262E. Science.** (Formerly numbered 262A-262B.) Mr. Troost
- 262G. Business Education.** (Formerly numbered 267A-267B.) Mr. Wanous
- 262H. Industrial Arts.** Mr. Monroe
- 262I. Vocational Education.** (Formerly numbered 268A-268B.) Mr. Barlow
- 262J. Economic Education.** Mrs. Kourilsky



**263A-263B-263C. Seminars: Education of Exceptional Children.**

263A. Education of Exceptional Children.  
Mr. Hewett, Mrs. Keogh, Mrs. Seagoe

263B-263C. Learning Disorders.  
(Same as Psychology 276A-276B.)  
Mr. Coleman

**264. Seminar: Teacher Education.**

Prerequisite: internship experience in the supervision of prospective teachers. The exploration of past and current practices in teacher education, coupled with an experimentally based approach to the assessment of such programs.

Mr. Goodlad, Mr. Popham

**267. Seminar: Educational Technology.**

(Formerly numbered 269B.) Prerequisite: course 433A; 418A, 419A and 433B recommended.

Mrs. Baker

**269A-269B. Seminar: Inquiry Into Childhood Schooling.**

(Formerly numbered 254B.) Mr. Goodlad

**270A-270F. Seminars: Administration.**

270A. School Government.  
(Formerly numbered 271.) Prerequisite: course

240B. Mr. Layton, Mr. Lindman, Mr. Scribner

270B. Personnel Management.  
(Formerly numbered 272.) Prerequisite: course

240C. Mr. Fawcett, Mr. Williams

270C. Educational Finance.  
(Formerly numbered 271.) Prerequisite: course

240D. Mr. Alkin, Mr. Lindman

270D. Instructional Design and Supervision.  
(Formerly numbered 273.) Prerequisite: course

240E. Mr. Fielstra

270E. Organizational Research.  
(Numbered 270H in 1966-1967.) Mr. Williams

270F. Systems Analysis in Education. Mr. Bruno

**Professional Courses**

**§324A-324B-324C. Supervised Teaching:**

**Elementary.** Mr. McNeil and Staff

324A. Supervised Teaching: Elementary. (1½ courses)  
(Formerly numbered 322C and 324A.)

324B. Supervised Teaching: Elementary. (1½ courses)  
Prerequisite: course 324A.

324C. Supervised Teaching: Supplementary Teaching in the Elementary School. (¾ to 1½ courses)

**§326ER. Supervised Teaching: Educable Mentally Retarded. (1½ courses)**

Prerequisite: courses 128A and 128B.  
Mr. McNeil and Staff

**§326SR. Supervised Teaching: Severely Mentally Retarded. (1½ courses)**

Prerequisite: courses 128A and 128C.  
Mr. McNeil and Staff

**§329. Supervised Library Service. (½ to 1 course)**

(Formerly numbered 328L.) Prerequisite: limited to students or alumni of the UCLA School of Library Service.  
Mr. McNeil and Staff

**§330A-330B-330C. Supervised Teaching:**

**Secondary.** Mr. McNeil and Staff

330A. Supervised Teaching: Secondary.

330B. Supervised Teaching: Secondary.  
Prerequisite: course 330A.

330C. Supervised Teaching: Supplementary Teaching in Secondary School.  
(Formerly numbered 330E.)

**334. Supervised Teaching: Junior College.**

Prerequisite: course 431, or 130 and 209A.  
Mr. A. Cohen

**413A-413B-413C. School Participation in Pupil Personnel Work.**

413A. School Participation in Pupil Personnel Works: Part I. (1 to 1½ courses)

Prerequisite: Consent of the instructor. Limited to majors in pupil personnel services. Two class hours, four to eight hours field work. Laboratory experience in counseling students in public schools.

Mr. Seron

413B. School Participation in Pupil Personnel Works: Part II. (1 to 1½ courses)

Prerequisite: Consent of the instructor. Limited to majors in pupil personnel services. Two class hours, four to eight hours field work. Laboratory experience in counseling students in public schools.

Mr. Seron

413C. School Participation in Pupil Personnel Works: Part III. (1 to 1½ courses)

Prerequisite: Consent of the instructor. Limited to majors in pupil personnel services. Two class hours, four to eight hours field work. Laboratory experience in counseling students in public schools.

Mr. Seron

**415A-415B. Appraisal of Individuals in Schools.**

415A. The Appraisal of Intelligence.  
(Numbered 215A in 1966-67.) Prerequisite:

courses 210A and 211A. The development of cognitive functioning in relation to intelligence testing; laboratory experience in individual testing.

Mr. Healy

415B. The Appraisal of Personality.  
(Numbered 215B in 1966-67.) Prerequisite:

course 415A. The role of biological and cultural determinants in the development of personality structures; personality, interest and attitude testing; analysis of case studies. Mrs. Feshbach

**416A-416B. The Appraisal and Guidance of the Handicapped.**

416A. The Appraisal of Exceptional Children.  
(Numbered 216A in 1966-67.) Prerequisite:

courses 116 and 415A. Individual appraisal of exceptional children with emphasis on the physically handicapped, mentally retarded, emotionally disturbed, neurologically handicapped and gifted; analysis of tests and diagnostic procedures; case studies. Mr. Share

§ All candidates must (1) secure the approval of the Office of Student Services at least one quarter prior to assignment, including formal recommendation of the University Physician and evidence of suitable scholastic averages; and (2) apply to the Director of Supervised Teaching by the middle of the quarter preceding the assignment. All courses four class hours except where otherwise indicated.

**416B. Guidance of the Handicapped.**  
(Numbered 216B in 1966-67.) Two class hours, four hours field work. Prerequisite: course 116. Educational, vocational and personal guidance of the exceptional; parent counseling; career and training opportunities; community referrals.

Mr. Share

**418A-418B. Programmed Instruction.**

**418A. Fundamentals of Programmed Instruction.**  
(Numbered 218A in 1966-67.) Prerequisite: course 112. Survey of rationale and techniques in the field of programmed instruction including the development and empirical try-out of short programs, utilizing data on responses of typical learners; elements of program assessment. Mrs. Baker

**418B. Theory and Practice in Programmed Instruction.**

(Numbered 218B in 1966-67.) Prerequisites: courses 211A, 212A and 418A; 212C, 212D or 421C recommended. An advanced course in programmed learning; analysis of complex behaviors and instructional systems; interrelations between psychological theory and the design of instructional programs.

**419A-419B. Experimental Study of Educational Programs.**

**419A. Experimentation on Media of Communication and Instruction.**

(Formerly numbered 219A.) Prerequisite: course 210A. Analysis of basic methods used and results obtained in experiments on the development of knowledge, skills and attitudes through audiovisual communication media and other instructional programs.

**419B. Experimental Analysis of Instructional Program Variables.**

(Formerly numbered 219B.) Two class hours, four hours laboratory. Prerequisites: courses 210A, 212A, 419A; 210B and 212B or 212C recommended. Advanced problems of methodology and rationale in the planning and conduct of experiments on the effects of psychologically defined variables in instructional programs; theory and techniques of laboratory and field experiments on instructional media.

**420A-420C. Curriculum Inquiry.**

**420A. Principles of Curriculum.**  
(Numbered 220A in 1966-67.) Critical examination of the basic concepts underlying the determination of objectives, the selection and organization of learning experiences, and the evaluation process. Mr. Popham, Mrs. Tyler

**420B. Instructional Analysis.**

Prerequisite: consent of instructor. Analysis of instructional variables as they relate to diverse types of instructional strategies. The student acquires skill in techniques of conducting instructional research. Mrs. Baker, Mr. Popham

**420C. Evaluation of Curriculum and Instruction.**

Prerequisite: consent of instructor. Ways of evaluating the effectiveness of curriculum and instruction, including assessment and improvement of teacher behavior and accomplishment. Mr. Popham, Mrs. Tyler

**421A-421B-421C. Early Childhood Education.**

**421A. Curriculum Development in Early Childhood Education.**

(Numbered 221A in 1966-67.) Critical study of early childhood education with implications for the curriculum in nursery school, kindergarten and primary grades. Mrs. Ramirez

**421B. Environmental Factors in Early Childhood Education.**

(Numbered 221B in 1966-67.) Development of culturally significant school programs derived from an examination of preschool and nonschool experiences of young children. Mrs. Ramirez

**421C. Cognitive Education of the Young Child.**

(Numbered 221C in 1966-67.) Prerequisite: courses 210A, 212A and 421A. A critical review of the experimental literature on the cultivation of intellectual abilities in the young child; the teaching of discrimination skills and the use of language; research methods in cognitive education including the use of instructional materials. Mr. Keislar, Mr. Riedford

**422. University Level Instruction. (½ course)**

A focus on the instructional decisions which must be made by members of a university faculty. Attention is given to a rigorous empirically based instructional model. Mr. Popham

**423. Instructional Strategies for Student Teachers. (½ course)**

Prerequisite: course 130. Problems encountered in supervised teaching will be explored and alternative solutions tested in a concurrent supervised teaching course. Mrs. Baker

**424A-424E. The Curriculum.**

**424A. The Social Studies in the Curriculum.**  
(Numbered 224A in 1966-67.) Advanced study in social studies curriculum development; problems in defining objectives and organizing single- and multidisciplinary programs; critical review of literature on children's cognitive and affective learning in social science, with emphasis on experimental study of instructional programs. Miss Crabtree

**424B. Reading in the Curriculum.**

(Numbered 224B in 1966-67.) Prerequisite: courses 124B and 210A. Study of reading curricula and instructional procedures, with emphasis on the rationale and research underlying their development and the research comparing their effectiveness.

**424C. Language in the Curriculum.**

(Numbered 224C in 1966-67.) Advanced study in the school language curriculum; application to the improvement of the curriculum in the field.

**424D. Mathematics in the Curriculum.**

(Numbered 224D in 1966-67.) Prerequisite: courses 124C and Mathematics 38. Study of the school mathematics curriculum; the new mathematics; evaluation procedures. Mr. Dutton

**424E. Science in the Curriculum.**

(Numbered 224E in 1966-67.) Prerequisite: courses 124C and 210A. Study of current research problems, findings, methodology and design in school science with emphasis on application to and improvement of instruction; new types of courses; curriculum development; instructional techniques. Mr. Troost

**428. Internship in the Education of Exceptional Children.**

Two class hours, six hours field work. Prerequisite: courses 228A-228B-228C-228D, 416A and one course from 229A through 229C. Mr. Hewett, Mrs. Seagoe

**429A-429B. Internship in the Supervision of Student Teachers.**

429A. Design and practicum experience in the on-campus pre-student teaching preparation of prospective student teachers.

Mrs. Baker, Mr. McNeil

429B. Design and practicum experience in the Off-campus pre-student teaching preparation of student teachers.

Mr. McNeil, Mr. Popham

**431. The Junior College Curriculum.**

(Numbered 231 in 1966-67.) Trends, practices, problems, and issues in the development and implementation of junior college curricula and instructional procedures as they relate to the functions of the two-year college and the characteristics of junior college students.

Mr. A. Cohen

**433A-433B. Educational Technology.**

433A. Instructional Product Development.

Prerequisite: course 112 or 130. An examination of the procedures employed in the systematic development of instructional products. Students acquire competencies associated with those procedures.

Mr. Popham

433B. Technological Development in Educational Media.

(Numbered 233B in 1966-67.) Two class hours, four hours laboratory. Prerequisite: courses 112 and 433A; 210A and 212A recommended. Theory, current problems, and anticipated trends in instrumentation and systems development for instructional applications and research; including computer-aided instruction, communication satellites, and other advanced systems; theory and laboratory practice with instrumentation in educational research.

**436A-436E. Business Education.**

436A. Principles and Problems of Business Education.

(Numbered 236A in 1966-67.) Historical development and principles, practices, and problems in business education in secondary schools and colleges.

Mr. Erickson

436B. Business Education in Secondary and Higher Education: Advanced.

(Numbered 236B in 1966-67.) Advanced study in business education with a critical analysis of significant research applicable to curriculum and teaching practices.

Mr. Erickson

436C-436D. Education in Family Finance.

Prerequisite: credit toward advanced degrees by petition only. Theories, principles, concepts and research relating to sound personal and family financial management.

Mr. Erickson

436E. Evaluation and Field Research in Family Finance Education. (¼ to 1 course)

Concepts and principles relating to family finance education and their application to teaching situations.

Mr. Erickson

**437A-437B-437C. Technological Change and Business Education.**

437A. Principles of Curriculum in Economic Education.

(Numbered 237A in 1966-67.) Theories, principles and concepts relating to an understanding of the business and economic system; their application to teaching in the secondary school.

Mr. Erickson, Mrs. Kourilsky

437B. Corporate Educational Programs.

(Numbered 237B in 1966-67.) History and scope of corporate training programs; current educational problems in training programs within industry as they are affected by automation and technological change.

Mr. Erickson

437C. Curriculum in Electronic Computers.

This course deals with courses of study, instructional materials, methods of presentation and evaluation of a number of programs in automated information processing for high schools and junior colleges.

Mr. Wanous

**438A-438B. Vocational Education.**

(Formerly numbered 238A-238B.) Prerequisite: course 100 or the equivalent. An advanced course in the principles of vocational education from the point of view of supervisory and administrative personnel.

Mr. Barlow

**439A-439B. Industrial Arts Education.**

439A. Industrial Arts Education: Principles and Programs.

(Formerly numbered 239A.) Prerequisite: baccalaureate degree with background of industrial arts instruction. The purposes and processes in industrial arts in the secondary school with their implications in a technological society.

Mr. Monroe

439B. The Industrial Arts Curriculum in Secondary Schools.

(Formerly numbered 239B.) Objectives, organization and presentation of subject matter in industrial arts; adaptation to individual interest.

Mr. Monroe

**440. Internship in Administration.**

(Formerly numbered 441, 442, 446 and 447.) Two class hours, six hours field work. Prerequisite: approval of the Area of Administrative Studies.

The Staff

**441A-441D. Administration Specializations.**

441A. Elementary School Administration.

(Numbered 241A in 1966-67.) Prerequisite: course 240A or consent of instructor. Theoretical and functional aspects of elementary school administration and supervision in varied organizational structures.

Mr. Lucio

441B. Secondary School Administration.

(Numbered 241B in 1966-67.) Prerequisite: course 240A or consent of instructor. Theoretical and functional aspects of secondary school administration and supervision in varied organizational structures.

Mr. Vredevoe, Mr. Williams

441C. School District Administration.

(Numbered 241C in 1966-67.) Prerequisite: course 240A or consent of instructor. Theoretical and functional aspects of school district administration and supervision in varied organizational structures.

Mr. Fawcett

441D. Junior College Administration.

(Numbered 241D in 1966-67.) Prerequisite: course 240A or consent of instructor. Theoretical and functional aspects of junior college administration and supervision in varied organizational structures.

Mr. Kintzer

**449. Internship in Junior College Administration.**

(½ to 1 course)

May be repeated twice for credit. Mr. Yelvington

**461A-461B-461C. Seminars: Adult Education.**

- 461A. Adult education in other countries: cultural determinants. Mr. Sheats  
 461B. Community agencies of adult education and institutional resources; field visitations, consultations with staff in public and private programs. Mr. Sheats  
 461C. Community development programs in the U. S.: scope, related research, and field observation. Mr. Sheats

**470A-470B-470C. Seminars: Administration.**

- 470A. Elementary School Administration. (Numbered 270E in 1966-67.) Prerequisite: course 441A. Mr. Lucio  
 470B. Secondary School Administration. (Numbered 270F in 1966-67.) Prerequisite: course 441B. Mr. Vredevoe  
 470C. Administration of Higher Education. (Numbered 270G in 1966-67.) Prerequisite: course 441D. Mr. Johnson, Mr. Kintzer

**Individual Study and Research****596. Directed Independent Study. (½ to 2 courses)**

Individual study or research for graduate students. Maximum credit, three courses. The Staff

**597. Preparation for the Master's Comprehensive Examination or the Doctoral Qualifying Examination.**

Individual study for master's degree comprehensive examinations or for qualifying examinations on the Ph.D. or Ed.D. Maximum credit, two courses. The Staff

**598. Thesis Research.**

Research for and preparation of the master's thesis. Maximum credit, two courses. The Staff

**599. Dissertation Research. (1 or 2 courses)**

Research for and preparation of the doctoral dissertation. Maximum credit, no limit. The Staff

**ENGINEERING AND APPLIED SCIENCE**

(Department Office, 7400 Boelter Hall)

Frederick G. Allen, Ph.D., *Professor of Engineering and Applied Science.*

Masanao Aoki, Ph.D., *Professor of Engineering and Applied Science.*

Morris Asimow, Ph.D., *Professor of Engineering and Applied Science.*

A. V. Balakrishnan, Ph.D., *Professor of Engineering and Applied Science and Professor of Mathematics.*

John L. Barnes, Ph.D., *Professor of Engineering and Applied Science.*

Joseph S. Beggs, D.Eng., *Professor of Engineering and Applied Science.*

Harry Buchberg, M.S., *Professor of Engineering and Applied Science.*

Albert F. Bush, M.S., *Professor of Engineering and Applied Science and Professor of Public Health.*

Harry W. Case, Ph.D., *Professor of Engineering and Applied Science and Professor of Psychology.*

Andrew Charwat, Ph.D., *Professor of Engineering and Applied Science.*

Francis F. Chen, Ph.D., *Professor of Engineering and Applied Science.*

Julian D. Cole, Ph.D., *Professor of Engineering and Applied Science.*

Reno R. Cole, M.S., *Professor of Engineering and Applied Science.*

Edward P. Coleman, Ph.D., *Professor of Engineering and Applied Science.*

David L. Douglass, Ph.D., *Professor of Engineering and Applied Science.*

C. Martin Duke, M.S., *Professor of Engineering and Applied Science.*

Donald K. Edwards, Ph.D., *Professor of Engineering and Applied Science.*

Robert S. Elliott, Ph.D., *Professor of Engineering and Applied Science.*

J. Morley English, Ph.D., *Professor of Engineering and Applied Science.*

Gerald Estrin, Ph.D., *Professor of Engineering and Applied Science.*

Alan E. Flanigan, Ph.D., *Professor of Engineering and Applied Science.*

A. Theodore Forrester, Ph.D., *Professor of Engineering and Applied Science and Professor of Physics.*

Kurt Forster, Ph.D., *Professor of Engineering and Applied Science.*

Louis L. Grandi, M.S., *Professor of Engineering and Applied Science.*

Warren A. Hall, Ph.D., *Professor of Engineering and Applied Science, Resident at Riverside.*

John C. Harper, D.Sc., *Professor of Engineering and Applied Science and Professor of Agricultural Engineering, Resident at Davis.*

Samuel Herrick, Ph.D., *Professor of Engineering and Applied Science and Professor of Astronomy.*

Thomas E. Hicks, Ph.D., *Professor of Engineering and Applied Science.*

W. C. Hurty, M.S., *Professor of Engineering and Applied Science.*

Walter J. Karplus, Ph.D., *Professor of Engineering and Applied Science.*

William J. Knapp, Sc.D., *Professor of Engineering and Applied Science.*

Eldon L. Knuth, Ph.D., *Professor of Engineering and Applied Science.*

Cornelius T. Leondes, Ph.D., *Professor of Engineering and Applied Science.*

Tung Hua Lin, D.Sc., *Professor of Engineering and Applied Science.*

John H. Lyman, Ph.D., *Professor of Engineering and Applied Science and Professor of Psychology.*

John D. Mackenzie, Ph.D., *Professor of Engineering and Applied Science.*

Joseph W. McCutchan, M.S., *Professor of Engineering and Applied Science.*

William C. Meecham, Ph.D., *Professor of Engineering and Applied Science.*

Michel Melkanoff, Ph.D., *Professor of Engineering and Applied Science.*

Antony J. A. Morgan, Ph.D., *Professor of Engineering and Applied Science.*

Rokuro Muki, Ph.D., *Professor of Engineering and Applied Science.*

Ken Nobe, Ph.D., *Professor of Engineering and Applied Science.*

Herbert B. Nottage, Ph.D., *Professor of Engineering and Applied Science.*

Russell R. O'Neill, Ph.D., *Professor of Engineering and Applied Science.*

Wesley L. Orr, C.E., *Professor of Engineering and Applied Science.*

Richard L. Perrine, Ph.D., *Professor of Engineering and Applied Science.*

Russell L. Perry, M.E., *Professor of Engineering and Applied Science and Professor of Agricultural Engineering, Resident at Riverside.*

Arthur F. Pillsbury, Engineer, *Professor of Engineering and Applied Science.*

Louis A. Pipes, Ph.D., *Professor of Engineering and Applied Science.*

Lawrence B. Robinson, Ph.D., *Professor of Engineering and Applied Science.*

Allen B. Rosenstein, Ph.D., *Professor of Engineering and Applied Science.*

Moshe F. Rubinstein, Ph.D., *Professor of Engineering and Applied Science.*

Frederick W. Schott, Ph.D., *Professor of Engineering and Applied Science.*

George H. Sines, Ph.D., *Professor of Engineering and Applied Science.*

Chauncey Starr, Ph.D., *Professor of Engineering and Applied Science.*

Antonin Svoboda, D.Tech.Sci., *Professor of Engineering and Applied Science.*

Edward H. Taylor, M.S., *Professor of Engineering and Applied Science.*

Alan S. Tetelman, D.Eng., *Professor of Engineering and Applied Science.*

William T. Thomson, Ph.D., *Professor of Engineering and Applied Science, Resident at Santa Barbara.*

Andrew J. Viterbi, Ph.D., *Professor of Engineering and Applied Science.*

Alfred S. Yue, Ph.D., *Professor of Engineering and Applied Science.*

Roy Bainer, M.S., *Emeritus Professor of Engineering and Applied Science and Emeritus Professor of Agricultural Engineering, Resident at Davis.*

Ralph M. Barnes, Ph.D., *Emeritus Professor of Engineering and Applied Science, and Production Management.*

Charles T. Boehnlein, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

Alexander W. Boldyreff, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

W. D. Hershberger, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

Ellis F. King, M.S., E.E., *Emeritus Professor of Engineering and Applied Science.*

W. Julian King, M.S., M.E., *Emeritus Professor of Engineering and Applied Science.*

Thomas A. Rogers, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

Daniel Rosenthal, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

William F. Seyer, Ph.D., *Emeritus Professor of Engineering and Applied Science.*

Alan J. Ardell, Ph.D., *Associate Professor of Engineering and Applied Science.*

Algirdas Avizienis, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Douglas Bennon, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Bertram Bussell, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Bonham Campbell, A.B., E.E., *Associate Professor of Engineering and Applied Science.*  
 Jack W. Carlyle, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Stanley B. Dong, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Traugott H. K. Frederking, Ph.D., *Associate Professor of Engineering and Applied Science.*

Sheila A. Greibach, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Reinhard K. B. Helbing, Ph.D., *Associate Professor of Engineering and Applied Science.*

David Isaacs, Ph.D., *Associate Professor of Engineering and Applied Science, Resident at Irvine.*

Leonard Kleinrock, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 William Klement, Jr., Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Kenneth L. Lee, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Peter W. Likins, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Chung-Yen Liu, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Ajit K. Mal, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Ralph B. Matthiesen, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Philip F. O'Brien, M.S., *Associate Professor of Engineering and Applied Science.*  
 Allen R. Stubberud, Ph.D., *Associate Professor of Engineering and Applied Science, Resident at Irvine.*

Gabor C. Temes, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 William D. Van Vorst, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Jacques J. Vidal, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Cadambangudi R. Viswanathan, Ph.D., *Associate Professor of Engineering and Applied Science.*

Paul K. C. Wang, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Ahmed R. Wazzan, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Russell A. Westmann, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Jack Willis, B.Sci., *Associate Professor of Engineering and Applied Science.*  
 Cavour W. Yeh, Ph.D., *Associate Professor of Engineering and Applied Science.*  
 Nicolaos G. Alexopoulos, Ph.D., *Assistant Professor of Engineering and Applied Science.*

Ronald F. Bauer, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Alfonso Cardenas, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Ivan Catton, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Chieh Chu, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Wesley Chu, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard Collins, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 G. Terrance Cotter, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Vernon E. Denny, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Joseph J. DiStefano, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 John A. Dracup, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard I. Emori, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Robert C. Erdmann, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Lewis P. Felton, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Gary C. Hart, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 James Holm-Kennedy, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 William C. L. Hu, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Y. Marvin Ito, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Stephen Jacobsen, Ph.D., *Assistant Professor of Engineering and Applied Science.*

Dah-teng Jeng, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Victor A. Jenschke, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 William E. Kastenberg, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Robert E. Kelly, Sc.D., *Assistant Professor of Engineering and Applied Science.*  
 Allen Klinger, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Dieter P. Landolt, Dr.Sc.Tech., *Assistant Professor of Engineering and Applied Science.*

Nhan Levan, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 David C. Luckham, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 David F. Martin, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Lawrence P. McNamee, Ph.D., *Assistant Professor of Engineering and Applied Science.*

Anthony F. Mills, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 D. Lewis Mingori, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Fereidoun Mobasheri, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard E. Mortensen, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard R. Muntz, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard B. Nelson, D.Sc., *Assistant Professor of Engineering and Applied Science.*  
 Ragnar N. Nilsen, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Jimmy K. Omura, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Kanji Ono, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Ronald J. Pogorzelski, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Sanford B. Roberts, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 John A. Seeger, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Lawrence C. Selna, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Aly H. Shabaik, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Awtar Singh, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Craig B. Smith, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Frank W. Spaid, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Oscar M. Stafsudd, Jr., Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Richard Stern, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Tien-Fan Tao, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Gershon Weltman, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Donald M. Wiberg, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 David A. Wismer, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 Joseph A. Wolf, Jr., Sc.D., *Assistant Professor of Engineering and Applied Science.*  
 Kung Yao, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 William W-G. Yeh, Ph.D., *Assistant Professor of Engineering and Applied Science.*  
 ———, *Assistant Professor of Engineering and Applied Science.*  
 ———, *Assistant Professor of Engineering and Applied Science.*



Robert M. L. Baker, Jr., Ph.D., *Lecturer in Engineering and Applied Science.*  
 Roger A. Broucke, Docteur En Sciences Mathématiques, *Acting Associate Professor of Engineering and Applied Science.*  
 Rointan F. Bunshah, D.Sc., *Acting Professor of Engineering and Applied Science.*  
 Didier de Fontaine, Ph.D., *Acting Associate Professor of Engineering and Applied Science.*  
 John C. Dillon, B.S., *Lecturer in Engineering and Applied Science.*  
 Julian S. Hatcher, Ph.D., *Lecturer in Engineering and Applied Science.*  
 Slade Hulbert, Ph.D., *Lecturer in Engineering and Applied Science.*  
 William B. Kehl, A.M., *Lecturer in Engineering and Applied Science.*  
 Levi J. Knight, Jr., M.S., *Associate in Engineering and Applied Science.*

Leon Levine, M.S., *Lecturer in Engineering and Applied Science.*

Clement J. Melancon, A.B., *Lecturer in Engineering and Applied Science.*

Derwyn M. Severy, M.S., *Lecturer in Engineering and Applied Science.*

William W. Simmons, Ph.D., *Acting Associate Professor of Engineering and Applied Science.*

Rangasami Sridhar, Ph.D., *Acting Professor of Engineering and Applied Science.*

Johanna E. Tallman, A.B., Cert. in Lib., *Lecturer in Library Service and Engineering Bibliography.*

George J. Tauxe, M.S., *Lecturer in Engineering and Applied Science.*

Charles Wojcik, Ph.D., *Lecturer in Engineering and Applied Science.*

#### Lower Division Courses

### 5. Computers in the Man-Made World.

An introduction to computers and computing for non-mathematically oriented students. How a computer functions and how one can "talk" to it will be explained through a study of logical circuits, memory, control, arithmetic, computer organization and programming. Mr. Bussell in charge

### \*9A-\*9B. Introduction to Humanities, the Arts and Social Science.

Prerequisite: Subject A requirement satisfied. An introduction to humanities, the arts, social sciences and technology in the framework of lectures and discussions of human problems and the roots of our culture. Guest lecturers from the colleges of Fine Arts, Letters and Science, and Engineering. Mr. Weltman in charge

### 10. Introduction to Computing.

Lecture, three hours; laboratory, two hours. Not open for credit to students having taken 6A. Algorithms and programming languages. Description of a higher-level language such as FORTRAN IV. Selected topics in numerical analysis. Organization and characteristics of digital computers. Machine language. Programming and running of several numerical and non-numerical problems. Mr. Bussell, Mr. Melanoff in charge

### 11. Patterns of Problem Solving.

An introduction to patterns of reasoning in the process of problem solution and decision making. Exposure to concepts, theories and techniques in the analysis and synthesis of total systems in our complex technological civilization. Mr. Rubinstein in charge

### 20A. Circuit Analysis

Prerequisite: Physics 7B; Mathematics 13C (may be taken concurrently). Elements of electrical circuit analysis, with emphasis on solutions of passive linear lumped parameter circuit problems; analogues and duals; applications of steady state and transient analysis to linear electrical, mechanical, acoustic and thermal systems. Mr. Willis in charge

#### Upper Division Courses

### 100. Circuit Analysis.

Prerequisites: courses 10, 101A, or equivalent; Physics 7B; not open for credit to students having taken 20A or 100A. Linear time-invariant network elements and equations, introduction to time varying and non-linear elements. Zero-state, zero-input and complete responses. Duality and analogy. General analysis methods. Elementary Laplace transforms, network functions and frequency response. Network theorems. Mr. Willis in charge

### 100L. Circuit Analysis Laboratory. (½ course)

Prerequisite: courses 10, 101A, or equivalent; Physics 7B. Experiments with circuits containing linear, nonlinear and time varying devices, transient and steady behavior of circuits. Computer analysis of circuit problems. Mr. Willis in charge

### 100A. Circuit Analysis.

Prerequisite: Physics 7B; Mathematics 13C (may be taken concurrently). Primarily for transfer students. Not open to students who have had Engineering 20A. Elements of electrical circuit analysis, with emphasis on solutions of passive linear lumped parameter circuit problems; analogues and duals; applications of steady state and transient analysis to linear electrical, mechanical, acoustic and thermal systems. Mr. Willis in charge

### 100B. Electromagnetics.

Prerequisite: course 100 or 100A (may be taken concurrently). A physical and analytical study of electrostatic, magnetostatic, and time-varying electromagnetic fields with engineering applications. Mr. Elliott in charge

### 100C. Systems, Signals and Noise.

Prerequisite: courses 6A or 10, 6B, 20A or 100 or 100A, Mathematics 13C. Continuation of course 20A or 100A; application of transform methods to systems analysis; linear system input-output relations; signals and spectra; modulated signals; introduction to random signals, noise, and modern communication systems concepts. Applications to various contemporary engineering systems problems. Mr. Levan in charge

### 100D. Information Processing Systems.

Prerequisite: course 10, Physics 7B. Representation of information. Description of information processing algorithms. Digital storage and operator elements. Boolean algebra. Combinational and sequential logic nets. Technology of digital circuits. Digital computer organization: transfer, storage, arithmetic, control, and input/output operations. Analogue techniques for information processing. Mr. Avizienis, Mr. Bussell in charge

### 101A. Engineering Analysis.

Prerequisite: Physics 7B and 7C; Mathematics 12C (may be taken concurrently); a course in linear algebra (e.g., Mathematics 12A). This course is open to sophomores in Pre-Engineering. (Not open to students who have taken a course in differential equations.) Introduction to ordinary differential equations encountered in engineering systems. Solution of constant-coefficient differential systems; initial and boundary conditions; operational methods; relevant applications of matrix theory. Series expansions; brief introduction to special functions. Mr. Mortensen in charge

\* Not to be given 1970-1971.



**102A. Engineering Dynamics.**

Prerequisite: courses 101A, 108. Fundamental concepts of dynamics; kinematics and dynamics of particles and rigid bodies; impulse-momentum and work-energy relations; conservative and non-conservative systems; simple harmonic motion; motion under a central force; introduction to rigid body kinematics and dynamics in three dimensions; applications in two dimensions. Mr. Likins in charge

**102B. Intermediate Dynamics. (½ course)**

Prerequisite: course 102A. Potential theory and motion in potential fields; introduction to analytical dynamics; Lagrange's equations; general motion of rigid bodies in three dimensions

Mr. Forster in charge

**103A. Elementary Fluid Mechanics.**

Prerequisite: courses 101A, Physics 7C. An introductory course dealing with the application of the principles of mechanics to the flow of compressible and incompressible fluids. Introduces flow in conduits and boundary layers. Mr. Meecham in charge

**104A. Experimental Engineering.**

Lecture, one hour; laboratory, seven hours. Prerequisite: completion of all required lower division engineering courses. Extension of theoretical analysis, research and design by experimental methods. Problems and projects involving materials and circuits in electrical, mechanical, thermal, structural, acoustical and fluid systems with primary emphasis on lumped parameters. Occasional field trips.

Mr. Grandi in charge

**104B. Experimental Engineering.**

Lecture, one hour; laboratory, seven hours. Prerequisite: course 104A. Continuation of course 104A with problems and projects involving energy conversion and engineering systems but with emphasis on distributed parameters. Initiative, judgment and economy in design of experimental methods, instrumentation selection, and use of computer facilities. Occasional field trips. Mr. Grandi in charge

**104C-104D. Experimental Engineering.**

Laboratory, eight hours. Prerequisite: completion of all required junior year engineering courses. The course will be organized into group projects of a design nature. Each project will be conducted by a group of eight students to carry it forward from the initial concept to its final construction and testing. Mr. Grandi in charge

**105A. Engineering Thermodynamics.**

Prerequisite: Physics 7C and Mathematics 12C. Phenomenological thermodynamics. Concepts of equilibrium, temperature and reversibility. First law and concept of energy; second law and concept of entropy. Equations of state and thermodynamic properties. Application of these principles in analysis of closed and open systems of engineering interest. The Staff in charge

**105B. Engineering Thermodynamics.**

Prerequisite: course 105A. Statistical thermodynamics. Calculations of thermodynamic functions for the perfect diatomic gas, perfect monatomic crystal, perfect electron gas, and photon gas. Thermionic emission. Fluctuations. Chemical equilibrium. Phase rule. Adiabatic reaction temperatures. Mr. Knuth in charge

**105C. Transport Phenomena. (½ course)**

Prerequisite: courses 103A, 105B. Transport properties, viscosity, conductivity, and diffusivity. Formulation of transport rates for mass, momentum, energy, and molecular species. Engineering applications. Mr. Edwards in charge

**105D. Transport Phenomena.**

Prerequisite: courses 101A, and Physics 7C; not open for full credit to students having taken 105C. Transport properties: viscosity, conductivity, and diffusivity. Formulation of transport rates for mass, momentum, energy, and molecular species. Engineering applications.

Mr. Bennion, Mr. Edwards in charge

**106A. Principles of Engineering Economy.**

Prerequisite: upper division standing. Economic analysis of engineering projects; value systems; economic decisions on capital investment and choice of engineering alternatives; new projects, replacement and abandonment policies; risky decisions including make/buy policies and research investment; corporate financial practices and accounting.

Mr. Orr in charge

**106B. Theory and Methods of Engineering Design.**

Prerequisite: senior standing in engineering. Engineering design fundamentals; methodology and the design process; decision theory as applied to design; optimization processes and techniques; special analytical tools; student design projects. Students selecting group projects for 104C-D subsequently may integrate these with their 106B design projects.

Mr. Asimow in charge

**107. Introduction to Science of Materials.**

Prerequisites: Chemistry 1C; Physics 7D; to be taken concurrently with course 107L. Not open to students having taken 16A. Relationship between principles of physics and chemistry and properties of technological materials. Microscopic structures. Physical and mechanical properties of solids, emphasizing behavior of dislocations and electrons in crystals. Applications to engineering systems.

Mr. Ono in charge

**107L. Science of Materials Laboratory. (½ course)**

To be taken concurrently with course 107. Laboratory experiments on selected topics in materials science and engineering. Mr. Ono in charge

**107A. Principles of Biotechnology.**

Prerequisite: junior standing in engineering or consent of the instructor. The principles of biological science are developed in an engineering context. An emphasis is placed on how physiological, psychological, and sociological factors affect the integration of man into environmental, informational and managerial systems by engineering means.

Mr. Lyman in charge

**108. Introduction to Solid Mechanics.**

Prerequisite: Physics 7A, Mathematics 11C; not open to students having taken 15B or 108A. Equilibrium principles; transmission of forces; state of stress; state of strain; stress-strain relationship; work and energy. Structural applications; trusses, beams, columns, shafts and pressure vessels.

Mr. Lin in charge

**108A. Strength of Materials.**

Prerequisite: a course in analytical mechanics—statics, and junior standing in engineering. Primarily for transfer students. Not open to students who have completed course 15A–15B. Force-deflection relationships; energy; states of stress and strain; stress-strain-temperature-time relationships; analysis and design of structural elements (pressure vessels, beams, torsion bars, springs, columns, joints); inelastic behavior; energy methods; strength under combined loading; stress concentration; fatigue.

Mr. Dong, Mr. Westmann in charge

**109A. The Engineer and His Professional Duties.**

(½ course)

Prerequisite: senior standing in engineering. Discussion and oral and written reports on subjects within sociohumanistic content of engineering. Foundations of engineering. Responsibility of the engineer. Professional ethics, codes and attitudes. Emphasis is on the development of concepts and communication of these concepts to others.

Mr. O'Neill in charge

**110A. Electric Circuit Theory.**

Prerequisite: course 100; Mathematics 132 is desirable. Elementary graph theory, general network analysis. Review of Laplace transform, analytic functions and contour integration, the Laplace inversion integral. Network functions, positive real functions. Two-port networks, resistive networks, energy and passivity.

Mr. Cotter in charge

**110B. Passive Network Synthesis.**

(Formerly numbered 110A.) Prerequisite: course 110A or equivalent. Review of properties of positive real functions, tests for positive realness. One-port realizations of positive real functions by RLC elements and gyrator. Two-element-kind two-port synthesis.

Mr. Bauer in charge

**110C. Computer Aided Circuit Design.**

Prerequisite: courses 110A, 110B. Computer analysis of networks, tolerance and sensitivity analysis, numerical approximation, accuracy and rounding errors. Design of constrained circuits by iterative optimization techniques. Computer-oriented synthesis, systems of passive and active filters.

Mr. Temes in charge

**115A. Solid State Fundamentals.**

(Same as course 140A.) Prerequisite: junior standing in Engineering; courses 105B or 130A or equivalent is recommended. Introductory atomic concepts, quantum mechanical principles, energy level in complex atoms, quantum statistics, crystal structure, energy levels in solids, band theory, lattice vibrations, transport phenomena.

Mr. Viswanathan in charge

**115B. Dielectric, Magnetic and Conductive Properties of Solids.**

(Formerly numbered 140B.) Prerequisite: course 115A or 140A. Dielectric polarization; ferroelectric and piezoelectric materials; magnetization density. Diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, ferrimagnetism. Para- and ferromagnetic resonance. Tensor permeability. Statistical derivation of Ohm's and Joule's Laws for metallic conductors. Fermi energy. Debye theory of specific heat. Weidmann-Franz Law. Time-harmonic conductivity.

Mr. Elliott, Mr. Stafsudd in charge

**115C. Semiconductor Electronics.**

Prerequisite: course 115A or 140A. Semiconductor theory, intrinsic and extrinsic semiconductors, transport of excess carriers, recombination processes. Semiconductor materials. Semiconductor technology.

Mr. Tao in charge

**115D. Principles of Semiconductor Device Design.**

Prerequisite: senior standing in engineering; course 115C recommended. Review of excess carrier density in semiconductor; p-n junction; fundamentals of transistors; homogeneous and drift transistors; high frequency properties; high injection effects; transient response; field effect transistors; other semiconductor devices.

Mr. Holm-Kennedy, Mr. Viswanathan in charge

**115E. Solid State Electronics Laboratory.**

(½ course)

Prerequisite: courses 115B, 115C. Experiments on magnetic dielectric properties of solids; measurement of electronic properties of both p and n type semiconductors; thermal electronic properties of p-n junction; optical properties of semiconductors.

Mr. Tao, Mr. Viswanathan in charge

**115F. Semiconductor Devices Laboratory.**

(½ course)

Prerequisite: course 115D. Design and fabrication of homogeneous and inhomogeneous junctions and transistors; testing and characterization of these devices.

Mr. Holm-Kennedy, Mr. Stafsudd in charge

**116A. Active Electronic Circuits I.**

Prerequisite: course 20A or 100 or 100A. Equivalent circuit modeling of electron devices. Device-circuit-environment interactions. Design of single-stage amplifiers. Introduction to cascaded stages, coupling problems and frequency response.

Mr. Bauer in charge

**116B. Active Electronic Circuits II.**

Prerequisite: course 116A. Electron device-circuit-environment interactions with emphasis on multi-stage amplifiers. Tuned amplifier considerations. Nonlinear situations requiring graphical method of solution. Emphasis on design techniques including economics, reliability and realization of performance specifications.

Mr. Bauer in charge

**116C. Pulse and Digital Methods.**

Prerequisite: course 116A. Analysis and design of switching-mode electronic circuits and systems including pulse generation, logic operations, timing and frequency counting.

Mr. Cotter in charge

**117A. Electromagnetics I.**

Prerequisite: course 100B or equivalent. Special relativity, static electric fields, potential theory, and boundary-value problems. Mr. C. W. Yeh in charge

**117B. Electromagnetics II.**

Prerequisite: course 117A. Continuation of Engineering 117A. Lorentz transformation of Coulomb's law to yield static magnetic fields. Magnetostatics. Transformation to yield Maxwell's equations. Integral solutions. Plane, cylindrical, and spherical waves. Poynting's theorem. Mr. Pogorzelski in charge

**117C. Applications of Electromagnetic Theory.**

(1½ courses)

Prerequisite: courses 117A, 117B. Transmission lines, fully guided waves, surface guided waves and cavity resonators; microwave laboratory experimentation.

Mr. Schott in charge

**120A-120B. Random Signals.**

Prerequisite: course 100C or 121C, and Mathematics 131A or equivalent. Course 120B is not open for credit to those who have taken the former course 127A. Methods of analysis for random variables and random signals. Second order theory of random signals; introduction to prediction and filtering; Wiener and Kalman filters. Examples from communication, control, and data processing.

Mr. Aoki, Mr. Yao in charge

**120C. Point Processes in Engineering.**

Prerequisite: course 120A. Counting and Poisson processes. The birth and death process. Markov processes with discrete state spaces. The generalized Ballot theorem of Takacs. Renewal theory and its application to engineering problems.

Mr. Carlyle in charge

**121C. Signals and Systems.**

Prerequisite: courses 100 and 101A or equivalent. Not open for credit to students having taken 100C. Analysis of continuous-time and discrete-time signals and systems. Input-output description of linear systems. Representation of systems and signals by Fourier, Laplace and z-transform methods. Elementary stability criteria. Applications to various contemporary system science problems.

Mr. Levan in charge

**122A. Principles of Feedback Control.**

Prerequisite: course 100C or 121C or consent of the instructor. Mathematics 132 or equivalent is recommended. Classical methods of analysis and design of continuous and discrete-time linear feedback control systems.

Mr. Wang, Mr. Wiberg in charge

**122B. Optimal Control I.**

Prerequisite: course 128A or equivalent. Thorough treatment of the linear optimal control problem with quadratic cost.

Mr. Wang in charge

**123A. Basic Structures for Data Representation.**

Prerequisite: course 10. Linear lists; sequential and linked storage allocation; circular, multi-linked and multi-dimensional lists. Trees, traversing algorithms; representation and mathematical properties of trees. Dynamic storage allocation.

Mr. Melkanoff, Mr. Muntz in charge

**123B. Theoretical Models in Computer Science.**

Prerequisite: course 100D and senior standing, or consent of the instructor. Sets, strings, and languages. Phrase-structure languages. Finite-state languages and finite-state automata. Context-free languages and pushdown store automata. Unrestricted phrase-structure languages and Turing machines. Context-sensitive languages and linear-bounded automata. Elementary decision problems of automata and languages.

Mr. Martin, Mr. Muntz in charge

**124A. Computer Applications: Lumped Parameter Systems.**

Prerequisite: senior standing in engineering and course 100D. A comprehensive survey of the appli-

cation of analog and digital computers to the solution of engineering problems governed by ordinary differential equations. Formulation of engineering problems, elements of analog and digital computer systems, numerical analysis, and sources of error.

Mr. Karplus, Mr. McNamee, Mr. Nilsen in charge

**124D. Interfacing Digital Computers with External Systems.**

Prerequisite: course 100D. A survey of fundamentals. Adapting digital computers to interfaces, including multi-programming, interrupt and time-sharing considerations. Remote consoles, sampling, quantizing, multiplexing, analog-digital conversion, and data reconstruction.

Mr. Karplus in charge

**125A. The Logic Design of Digital Nets.**

Prerequisite: course 100D. Application of Boolean algebra to the design of combinational logic nets; minimization procedures. Analysis and synthesis of sequential switching circuits; clocked and asynchronous operation. Effects of microelectronic technology on logic design optimization. Fault masking by redundancy techniques.

Mr. Avizienis, Mr. Bussell, Mr. Svoboda in charge

**125B. Digital Computer Organization.**

Prerequisite: course 100D. Formal description and simulation of digital systems. Functional subsystems: arithmetic processors, storage systems, sequence generators, input-output, and data transmission systems. Organization of general purpose computers and of special purpose systems. Reliability aspects of computer operation.

Mr. Avizienis, Mr. Bussell, Mr. Nilsen

**125L. General Purpose Programming Languages.**

Prerequisite: course 10 and knowledge of at least one programming language. Introduction to formal grammars. Comparative and critical analysis of some general purpose programming languages including Fortran, Algol, Cobol, and PL/I.

Mr. Cardenas, Mr. Melkanoff in charge

**125N. Compiler Construction.**

Prerequisite: courses 100D, 125L or consent of the instructor. Modern compiler structure. Syntax analysis. Lexical analysis. Semantic analysis and runtime environment. Program and data structure. Code optimization.

Mr. Martin in charge

**126A. Simulation and Models.**

Prerequisite: course 100D and knowledge of a programming language. Model formulation and programming for discrete event systems in simulation languages (e.g., GPSS, SIMSCRIPT). The simulation data base and considerations for language development. Statistical considerations: design of experiments, random number generation, analysis of model results. Computer exercises.

Mr. Bussell, Mr. Nilsen, Mr. Reilly in charge

**127B. Introduction to Information and Communication Theory.**

Prerequisite: course 120A. Efficient coding of information sources; entropy; source-coding theorem; coding for discrete noisy channels; application to communication systems and continuous channels.

Mr. Omura in charge

**128A. Linear Systems.**

Prerequisites: course 100C or 121C, and Mathematics 132 (or consent of the instructor). Techniques of linear systems analysis. Contour integral

representations of functions of matrices; application to solution of linear vector differential and difference equations. Finite-dimensional state-space theory of linear systems. Mr. Omura, Mr. Wiberg

### 128D. Discrete Systems and Automata.

Prerequisite: consent of the instructor; Mathematics 110A or 115 or 131A recommended. An introduction to basic concepts of time-sequential system theory; state characterization, equivalence, minimization, memory; emphasis on finite-state machines, graphs, and finite automata. Diagnosis and identification. Introduction to regular expressions and design techniques. Mr. Carlyle in charge

### 128L. System Science Laboratory.

Laboratory, six hours. Prerequisite: courses 100C or 121C, and 120A, or consent of the instructor. A series of basic and optional laboratory experiments illustrating some of the fundamental concepts and modern engineering practices in the areas of systems, information, and control.

Mr. Wang, Mr. Yao in charge

### 129A. Introduction to Optimization Techniques.

Prerequisite: Mathematics 12A and 12C and some knowledge of digital computer programming or consent of the instructor. Unconstrained minimization of functions; gradient method, conjugate gradient method, variable metric method, direct search methods. Constrained minimization of functions; Lagrange multipliers, penalty function method, and others. Duality, comparison of techniques. Sample engineering problems. Student will solve problems on digital computers. Mr. Aoki in charge

### 130A. Introduction to Statistical Thermodynamics.

Prerequisite: course 105A. Calculations of expected values and variances of thermodynamic functions for perfect monatomic gas, Einstein monatomic crystal, photon gas, electron gas in a metal, perfect adsorbed gas, perfect diatomic gas, and Debye monatomic crystal. Calculations of gross emission rates from surfaces.

Mr. Knuth, Mr. Wazzan in charge

### 131A. Intermediate Heat Transfer.

Prerequisite: course 105C or 105D. Heat transfer by conduction in a stationary medium and by conduction and convection in a laminarily flowing fluid. Steady-state and transient conduction in solids. Heat transfer in laminar entrance flow in ducts and laminar boundary layer flows over surfaces.

Mr. Denny in charge

### 131B. Intermediate Heat Transfer.

Prerequisite: course 131A. Heat transfer by conduction and convection in turbulent flows. Convection involving changes of phase in boiling and condensation. Heat transfer by combined conduction, convection, and thermal radiation through nonabsorbing media.

Mr. Edwards in charge

### 131C. Radiative Transfer System Design.

Prerequisite: consent of the instructor. Analysis and synthesis of radiative transfer systems; radiant geometry among diffuse and specular surfaces; integral and finite-difference representations. Analog simulation; derivation of transfer functions and transfer matrices; analog and digital computers applied to design of thermal and luminous systems.

The Staff, Energy and Kinetics Dept. in charge

### 132A. Mass Transfer.

Prerequisite: course 131A. The principles of mass

transfer by diffusion. Mass transfer by convection in laminar and turbulent flows. Simultaneous heat and mass transfer. Applications including combustion of solids and volatile fuels, evaporation and condensation, ablation and transpiration cooling, gas absorption and catalysis.

Mr. Mills in charge

### 133A. Propulsion.

Prerequisite: courses 103A, 105C or 105D. Thermodynamic properties of gases. Flows in channels, nozzles and rocket motors. Power plant cycle analysis. The turbojet engine and its variants. Ramjets and pulse jets. Combustion. Aerodynamic design elements of compressors and turbines. Elements of aircraft and rocket performance.

Mr. Catton, Mr. Wazzan in charge

### 135A. Nuclear Reactor Theory.

Prerequisite: Mathematics 101 or equivalent. Introduction to nuclear reactor theory, basic physics, neutron diffusion, slowing down, and elementary thermalization in homogeneous reactor cores. Multi-region reactors and multi-group diffusion theory.

Mr. Kastenbergh in charge

### 135B. Nuclear Reactor Theory and Experiment.

Lecture, two hours; laboratory, four hours. Prerequisite: course 135A. Basic nuclear reactor theory and laboratory emphasizing special physical phenomena in a power reactor. The effects of heterogeneity, control rods, temperature, poisoning, and long term reactivity by theory and experiment.

Mr. Smith in charge

### 135C. Nuclear Reactor Processes and Laboratory.

Prerequisite: course 135B. Continuation of 135B. Fuel and product materials fuel management, isotope separation, energy removal, calculational techniques by numerical and experimental methods.

Mr. Smith in charge

### 137A. Chemical Equilibrium.

Prerequisite: courses 105A; 130A may be taken concurrently. Calculation of chemical potentials and activities, chemical reaction equilibrium constants, and phase equilibrium for ideal and real systems. Dynamic interpretation of equilibrium and introduction to chemical reaction rate expressions.

Mr. Bennion in charge

### 137B. Separation Operations.

Prerequisite: course 105C or 105D. Introduction to the principles of separation operations of importance to chemical process industry, pollution control and seawater desalination. Fundamentals of mass transfer applied to gas absorption, distillation, extraction and adsorption.

Mr. Landolt in charge

### 137C. Applied Chemical Kinetics.

Prerequisite: course 130A or 137A. Mechanisms of chemical reactions that are of importance to industrial systems. Measurement of reaction rates and interpretation of kinetic data. Interaction between transport phenomena and chemical kinetics. Introduction to chemical reactor design and control.

Mr. Bennion, Mr. C. Chu in charge

### 137D. Thermo-Chemical Processes.

Prerequisite: courses 137A, 137C or 131A. Application of the basic principles of heat, mass, and momentum transport to the design, operation, and control of thermochemical systems. Typical systems include heat exchangers, chemical reactors, high pressure vessels, high vacuum systems, distillation and chromatographic columns.

Mr. McCutchan in charge

**138A. Cryogenics.**

Prerequisite: course 105B or 130A. Gas liquefaction; cooling methods; cryogenic techniques and associated transport phenomena, changes of state and phase; superfluids. Mr. Frederking in charge

**138B. Fundamentals of Corrosion.**

Prerequisite: course 105A. Fundamentals of electrochemistry pertinent to complex corrosion processes are presented. Topics such as pitting, stress corrosion and hydrogen embrittlement will be discussed. Optional laboratory experiments will be offered. Mr. Landolt, Mr. Nobe in charge

**140A. Solid State Fundamentals.**

(Same as course 115A.) Prerequisite: junior standing in engineering; course 105B or 130A or equivalent is recommended. Introductory atomic concepts, quantum mechanical principles, energy level in complex atoms, quantum statistics, crystal structure, energy levels in solids, band theory, lattice vibrations, transport phenomena. Mr. Viswanathan

**140C. Electronic Structure and Properties of Metals.**

Prerequisite: course 115A or 140A. Lattice energy and crystal structure. Thermal properties of solids. Binary alloys. Hume-Rothery rules for alloy phases. Order-disorder transformations in solids. Elastic constants, conductivity, and superconductivity of perfect crystals and the effect of defects, impurities and alloying elements upon these properties. Mr. Wazzan in charge

**140D. Solid State Technology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 16A or 107. Rate processes and crystal growth. Technology and preparation of single crystals. Epitaxial growth. Vapor deposition and thin film techniques. Powder metallurgy, sintering processes. Annealing and diffusion techniques of semiconductors. Chemical and mechanical treatments of crystals. Mr. Yue in charge

**141. Phase Relations and Thermodynamics of Condensed Matter.**

Prerequisite: courses 16A or 107 and 105A. Stability of solids, liquids and glasses. Multicomponent phase diagrams. Relation between thermodynamic and physical properties. Phase changes and chemical reactions. Free energy of binary systems and the construction of phase diagrams. Thermodynamics of interfaces and defects. Mr. Knapp in charge

**142. Kinetics of Phase Transformations in Solids.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 141. Diffusion, grain growth, recovery and recrystallization, theories of nucleation and growth, solidification, precipitation from solid solution, spheroidization and coalescence of a dispersed phase, eutectoid decompositions, martensite transformations. Mr. Ardell, Mr. Flanigan in charge

**143A. Microstructural Control and Mechanical Properties of Solids.**

Lecture, three hours; laboratory, three hours. Prerequisite: courses 142, 158A. Yielding and flow properties of solids, dislocation mechanisms, fracture, microstructural effects and their control and design and selection of structural materials. Mr. Ono in charge

**145A. Crystal Structure and X-Ray Diffraction.**

Lecture, three hours; laboratory, three hours. Prerequisite: courses 16A or 107. Fundamentals of crystallography, stereographic projection, nature of X-Rays, interaction of X-Rays with crystals, applications of X-Ray-diffraction; determination of crystal structures, crystal imperfections, X-Ray spectroscopy. Electron and neutron diffraction.

**146A. Structure and Properties of Ceramics.**

Prerequisite: courses 142, 158A. The nature of typical ceramic materials. Bonding in ceramics. The relationship of crystal structure, microstructure and defects to properties including elastic, plastic strength, thermal and electrical. The structure and properties of glasses. Mr. MacKenzie in charge

**146B. Processing of Ceramics.**

Prerequisite: course 146A, or concurrent with 146A. A study of the processes used in fabrication, ceramics; and relationship to structure and properties. Processing operations including materials preparation, forming, sintering. Effects of thermal and chemical treatments. Mr. Knapp in charge

**146C. Properties of Art Ceramic Materials.**

Prerequisite: Art 190. Composition of art ceramic materials and products. Properties of ceramic bodies and glazes, and calculation methods used in expressing composition. Occasional field trips will be scheduled. (For students in Fine Arts.) Mr. Knapp in charge

**147A. Introduction to Physical Metallurgy.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 16A or 107. Structures and properties of metals and alloys. Influences of mechanical and thermal treatments. Plastic deformation, work hardening, and recrystallization. Grain growth. Distribution of phases in alloys. Alloy diagrams. Solution hardening. Diffusion hardening. Precipitation hardening. The iron-carbon system. Mr. Flanigan in charge

**147B. Metal Fabrication Processes.**

Prerequisite: courses 16A or 107; 158A. Theoretical basis for cold forming and hot forming processes; rolling, extrusion and forging. Conventional and electrochemical metal removal. Solidification processes and casting. Powder metallurgy. Mr. Shabalk in charge

**147C. Powder Metallurgy.**

Prerequisite: course 147A or equivalent. Forming of metal powder, sintering, engineering components, processing and properties of bearing and friction materials, cemented carbides, porous metals, electrical and magnetic materials.

**147D. Principles and Applications of Foundry Engineering.**

Prerequisite: course 147A or equivalent. Basic metallurgy of castings, solidification theory, rising, gating, principles of sand casting, investment casting, centrifugal casting, melting procedures, properties of cast alloys. Mr. Yue in charge

**147E. Vacuum Metallurgy.**

Prerequisite: course 141 or equivalent. Metallurgical processes carried out in vacuum including melting, purification, heat treatment, degassing of liquid metals, joining. Properties and applications of these materials. Mr. Bunshah in charge

**150A. Incompressible Fluid Dynamics.**

Prerequisite: course 103A. Equations of motion for inviscid incompressible flow. Vorticity equation, Kelvin's Theorem. Introduction to complex variable theory. Equations of motion for viscous incompressible flow. Navier-Stokes equations. Exact asymptotic and similarity solutions. Approximate methods of solution. Lubrication theory. Introduction to turbulent flow. Mr. Charwat, Mr. Meecham in charge

**150B. Compressible Fluid Dynamics.**

Prerequisite: course 103A. One dimensional gas dynamics: isentropic and non-adiabatic channel flows, steady and unsteady normal waves; shock and wind tunnels. Two-dimensional steady flows: shock-expansion theory. Inviscid field equations; linearized theory. Viscous compressibility effects (integral treatment of flat-plate boundary layer); transonic drag. Mr. Charwat, Mr. Meecham in charge

**153A. Engineering Acoustics.**

Prerequisite: upper division standing. General acoustics—wave equation, solutions, reflection, transmission, sources, radiation. Propagation in fluids—viscosity, acoustics as fluid motion, characteristics, aeroacoustics, pulse jet, jet noise, boundary layer noise. Propagation in solids—elasticity, crystal lattices, dislocations, superconductivity. Selected topics—liquid helium, cavitation, etc. Mr. Stern in charge

**155. Intermediate Dynamics.**

Prerequisite: course 102A or equivalent. Not open for full credit to students having taken 102B. The axioms of Newtonian mechanics, generalized coordinates, Lagrange's equations, variational principles; central force motion; kinematics and dynamics of a rigid body, Euler's equations, motion of rotating bodies, oscillatory motion, normal coordinates, orthogonality relations, the vibrating string. Mr. Forster in charge

**158A. Elasticity and Plasticity.**

Prerequisite: Mathematics 13C (may be taken concurrently). Three-dimensional stress and strain. Criteria for prediction of mechanical failure. Differential equations in three dimensions; analytical, numerical, and experimental solutions of plane state and torsion problems. (Stress function, iteration, strain gages, photoelasticity.) Homogeneous plastic flow, fast fracture, plastic tensile instability. Mr. Felton, Mr. Sines in charge

**159A. Introduction to Continuum Mechanics.**

Prerequisite: course 158A, senior standing in engineering or consent of the instructor. Elementary tensor analysis, the stress vector and the stress tensor, kinematics of deformation, material derivative, fundamental laws of continuum mechanics, conservation theorems, constitutive laws, and representative applications. Mr. Mal, Mr. Morgan, Mr. Westmann

**160A. Astrodynamics and Rocket Navigation.**

Prerequisite: Mathematics 13A. The practical application of celestial mechanics and allied fields to the navigation, guidance, and control of space vehicles and to related classical problems in astronomy. Mr. Herrick in charge

**160B. The Determination of Orbits.**

Prerequisite: course 160A or consent of the instructor. The theory, calculation, and differential correction of the preliminary orbits of space vehicles,

comets, minor planets, and satellites. The Laplacian first approximation. The Leuschner differential correction. Mr. Herrick in charge

**161A. The Reduction of Observations.**

Prerequisite: Mathematics 13A; course 160A recommended. Astronomical photogrammetry, reduction of radar observations, and other techniques employed in the handling of astrodynamical observational data. The theory of space range system, Baker-Numm cameras, range equipment, and anomalous luminous phenomena. Mr. Baker, Mr. Herrick in charge

**165A. Structures I.**

Prerequisite: course 15B or 108 or 108A. Introduction to basic structural systems: elementary trussed, flexural, and shell systems. Force-deflection properties. Energy methods, stability analysis. Design assignments. Mr. Hurty in charge

**165B. Structures II.**

Prerequisite: course 165A. Extension of material in Structures I. Generalization of energy principles. General formulation of linear equations in structural analysis. Solution by relaxation and iteration. Introduction to matrix methods. Application to frames, rings, arches, cables. Mr. Rubinstein in charge

**166. Structures III.**

Prerequisite: course 165B. Elements of stress and strain. Fundamentals of theory of elasticity and relation to mechanics of materials. Applications to plates, thick-walled cylinders, tapered beams, torsion. Unsymmetrical bending, shear analysis of stiffened thin-walled beams. Stability of columns, beam-column effects. Membrane theory of shells. Mr. Nelson in charge

**167. Design of Civil Structures.**

Prerequisite: course 165B (may be taken concurrently with consent of the instructor.) Design of structural systems such as bridges, buildings, etc. Introduction to optimization principles for components and for complete systems. An individual or group project to design a complete structural system. Mr. Matthieson in charge

**168. Design of Aerospace Structural Systems.**

Prerequisite: course 165B. Design of aircraft, helicopter, and space structures. External loadings and environment factors of safety; internal stresses; allowable stresses; applied theory of thin-walled structures; design for prevention of fatigue; selection of materials; optimization of configuration. Mr. Felton in charge

**169A. Introduction to Mechanical Vibrations.**

Prerequisite: course 102A. Fundamentals of vibration theory and applications. Free, forced and transient vibration of one and two degrees of freedom systems including damping and nonlinear behavior. Normal modes, coupling and normal coordinates. Elements of vibration and wave propagation in continuous systems. Mr. Hu, Mr. Hurty in charge

**171A. Dynamics and Stability of Linear Feedback Systems.**

Lecture, 3 hours; laboratory, 1 hour. Prerequisite: Mathematics 132. Principles of feedback in linear systems; parametric and nonparametric models of feedback systems, sensitivity, disturbance rejection, stability, unified treatment of continuous and discrete time systems. A laboratory to illustrate these principles. Mr. Di Stefano in charge

**171B. Design and Synthesis of Feedback Systems.**

Lecture, 3 hours; laboratory, 1 hour. Prerequisite: course 171A or 122A. Introduction to the design of feedback control system using methods derived from transform theory, unified treatment of both continuous and sampled-data systems. A laboratory illustrates these methods of design.

Mr. Di Stefano in charge

**171C. Dynamics and Control of Engineering Systems in the Time Domain.**

Prerequisite: Linear Algebra; course 171A is recommended. Analysis of systems described by state equations. Stability analysis and control system design using time domain methods. A unified treatment of continuous and discrete time systems.

Mr. Di Stefano in charge

**171D. On-Line Computer Control Systems.**

Prerequisite: course 171B or 122A. Methods of analysis and design of computer control systems; appropriate modelling techniques, instrumentation, direct digital control systems, and applications to industrial processes.

Mr. Wismer in charge

**172A. Introduction to Linear Programming and Operations Research.**

Prerequisite: course 120A or consent of the instructor. Introduction to the concepts and methods of linear programming and operations research. Linear programming topics include geometrical foundations, simplex methods, and duality. Operations research topics include game theory, pure and mixed strategies, decision theory, sequencing, scheduling, and inventory problems.

Mr. Jacobsen, Mr. Wismer in charge

**172B. Introduction to Nonlinear and Dynamic Programming.**

Prerequisite: knowledge of computer programming and linear algebra. Theory and computational algorithms for the solution of nonlinear optimization problems. Indirect and direct methods including equality and inequality constraints, Lagrange multiplier techniques, gradient, and nongradient methods, dynamic programming. Computer solutions are an integral part of the course.

Mr. Wismer in charge

**174A. Dynamic Programming.**

Prerequisite: Mathematics 13C. Introduction to mathematical analysis of multistage decision processes occurring in mathematical theory of control, in operations research and system analysis, and in mathematical economics; analytic formulation and numerical computation stressed; examples.

Mr. Wismer in charge

**177A. Economic Analysis of Engineering Investment.**

Prerequisite: courses 106A and 193A. Extension of course 106A to include more advanced topics. Analysis of risk in engineering ventures, new project studies, economic feasibility analysis, research project selection. Elementary macro-economic principles.

Mr. English in charge

**178A. Kinematics of Mechanisms.**

Prerequisite: course 102A. The analysis and synthesis of plane and space mechanisms by means of vectors and geometry. Both graphical and analytical methods are used. The applications of fundamental mechanical movements to a wide variety of problems are considered.

Mr. Beggs in charge

**178B. Machine Design.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 102A. Problems in the design of machine elements such as gears, shafts, and bearings, for rigidity, strength, wear, and fatigue life. Each student chooses a machine to be designed. The final design is defended in an oral examination before the class.

Mr. Beggs in charge

**180A. Environmental Biotechnology.**

Prerequisite: course 107A or consent of the instructor. Physical, physiological, and psychological aspects of the interaction between man and thermal, atmospheric, radiant, and mechanical agents and energies in the environment. Biological and physical requirements for engineering control of the environment; applications to complex systems.

Mr. Weltman in charge

**180B. Machine and Systems Biotechnology.**

Prerequisite: course 180A or consent of the instructor. Quantitative and qualitative methods for assessing man as a component in engineering design applications. Limits and optima of human psychophysiological capabilities applied to display-control design, decision-making problems, and task definition; problems of man-machine interactions in large-scale systems.

Mr. Lyman in charge

**181A. Air Pollution Control.**

Prerequisite: senior standing or consent of the instructor. Quantitative consideration of the air resource and its management. Air quality measurements and standards. Systems for pollution removal. Industrial, commercial and community air pollution problems. Data analyses and interpretations. Lectures, occasional laboratory and field trips.

Mr. Bush in charge

**182C. Luminous Environmental Control.**

Lecture, three hours; laboratory, one hour. Prerequisite: consent of the instructor. Optimum design of components and systems for control of visible-range flux; daylighting and luminaire lighting in buildings and mobile structures; illumination and color distributions, interreflections, shadows, specular reflection, psychophysics and economics; radiant simulators and town planning. Field trips.

Mr. O'Brien in charge

**184A. Engineering Hydrology.**

Prerequisite: senior standing or consent of the instructor; elementary probability recommended. Study of the hydrologic cycle in its relationship to the development of water resources. Climate, storms, evapo-transpiration, river basin mechanics. Runoff, yield, flood analysis and forecasting, soil erosion and sediment transport, quality degradation. Possible field trips.

Mr. Dracup in charge

**184B. Hydraulics.**

Prerequisite: course 103A. Principles of the flow of water in open and closed conduits. Steady and unsteady flow. Analysis and design of conveyance and distribution systems. Sediment transport. Hydraulic machinery.

Mr. E. H. Taylor in charge

**184D. Water Resources Quality Control Systems.**

Prerequisite: senior standing in engineering or consent of the instructor. Water as a resource; the physical, chemical, and biological bases of pollution and degradation. Potability and chemical aspects of quality control and reclamation; analytical, economic, and performance aspects of systems design for prevention and treatment. Field trips.

Mr. Bush in charge

**184E. Water Resources Engineering.**

Prerequisite: senior standing in engineering or course 103A or consent of the instructor. Introduction to the hydrology of surface and groundwater supplies; floods, sediment transport, and their regulation; works for water storage, energy conversion, conveyance and distribution; utilization for agricultural and urban purposes; quality management; water law, planning, economics, and institutions.

Mr. Mobasher in charge

**185A. Principles of Soil Mechanics.**

Prerequisite: courses 15A–15B or 108 or 108A. Physical Sciences 3G recommended. Soil as a foundation for structures and as a material of construction. Soil formation, classification, physical and mechanical properties, compaction, bearing capacity, earth pressures, consolidation and shear strength.

Mr. Duke, Mr. Lee in charge

**185B. Soil Mechanics—Laboratory Practices.**

(½ course)

Lecture, one hour; laboratory, three hours. Prerequisite: course 185A may be taken concurrently. Laboratory experiments to be performed by the students to get basic data required for assigned practice problems. Soil classification, Atterberg limits, permeability, compaction, shear strength and specific gravity determination.

Mr. Duke in charge

**186A. Elements of Construction.**

Lecture, two hours; laboratory, four hours. Prerequisite: senior standing in engineering. Anatomy of the industry, bidding and purchasing strategies, contracts, costs and economics, operations research in construction, planning and scheduling, equipment and materials, construction methods, field engineering techniques, observation and engineering analysis of current construction projects in the vicinity. Field trips.

Mr. Singh in Charge

**187A. Urban Transportation Systems.**

Lecture, three hours; laboratory, two hours. Prerequisite: junior standing in engineering. Functional analysis of rural and urban transportation needs and modes of accomplishment including private vehicles, trucks, busses, rail rapid transit, helicopter and other aircraft; interrelationships among the various transportation modes and land-use planning.

Mr. Emori in charge

**187B. Street and Highway Design.**

Lecture, two hours; laboratory, four hours. Prerequisite: course 187A (may be taken concurrently). Design of street and highway systems and components including tangent sections, curves, interchanges, access facilities, traffic controls, parking facilities; suboptimizations on utility, safety, cost, properties of materials, maintainability, present needs, future needs; individual and group design assignments.

Mr. Case in charge

**187C. Traffic Engineering.**

Lecture, two hours; laboratory, four hours. Prerequisite: course 187A (may be taken concurrently). Elements of modern traffic engineering practice, including design, installation, and maintenance of uniform traffic control devices; channelization; parking, surface and multi-level parking structures; traffic flow theory; highway capacity; pedestrian traffic; traffic department management.

Mr. Case in charge

**187D. Human Factors in Transportation.**

Prerequisite: course 180A or consent of the instructor. Interaction of human and machine factors in land, air, sea, and space transportation; physical, physiological, and psychological performance demands upon human operators; trauma-producing forces, psychological and other stresses upon humans; mitigation by engineering design of these harmful effects upon humans.

Mr. Case in charge

**191A. Operational and Transform Methods.**

Prerequisite: courses 20A or 100 or 100A, 102A; Mathematics 13C. Formulation of equations for linear electrical and mechanical systems; application of the Laplace transform for their solution; introduction to the theory of a complex variable and contour integration; the inversion formula and application to partial differential equations.

Mr. Forster in charge

**192A. Mathematics of Engineering.**

Prerequisite: junior standing in engineering; course 191A recommended. Applications of mathematical methods to engineering problems are considered involving systems whose mathematical formulation leads to the solution of ordinary differential equations. Topics include infinite series, matrix calculus, ordinary differential equations, and special functions.

Mr. J. D. Cole, Mr. Liu, Mr. Pipes in charge

**192B. Mathematics of Engineering.**

Prerequisite: course 192A. Applications of mathematical methods to engineering problems are considered. Elementary theories and methods of linear partial differential equations are presented. Basic techniques in solving boundary value problems involving potential, heat and wave equations are emphasized.

Mr. J. D. Cole, Mr. Liu, Mr. Pipes in charge

**192C. Mathematics of Engineering.**

Prerequisite: course 192B. Practical introduction to nonlinear differential equations; representative applications; presentation of various analytical methods employed in solution of technical problems taken from fields of electrical, mechanical, and civil engineering. Topological, operational, Poincare, van der Pol, and Kryloff-Bogoliuboff methods; technical problems. Mr. J. D. Cole, Mr. Liu, Mr. Pipes in charge

**193A. Engineering Probabilistics and Stochastics.**

Prerequisite: junior standing in engineering. Sets and set algebra; sample spaces; combinatorics; absolute and conditional probability; discrete and continuous random variables; probability distribution, increment, and density functions; Chebychev's inequality; Laplace-Fourier transforms; law of large numbers; central limit theorems; discrete and continuous stochastic processes.

Mr. J. L. Barnes in charge

**193B. Engineering Statistics.**

Lecture, four hours; laboratory, one hour. Prerequisite: course 193A or consent of the instructor. Fundamental statistical concepts, population (system), sample parameter, statistics; significance tests, confidence limits, efficient computational procedures; risk, power functions, operating characteristic curves; simple and multiple regression, bivariate normal distribution; analysis of variance, applications in engineering and industry. Mr. Coleman in charge



**198. Special Courses. (1/2 to 1 course)**

Prerequisite: senior standing in engineering; enrollment subject to approval of instructor in charge. May be repeated for credit toward the Bachelor's degree provided no duplication exists. Group study of selected topics. Study groups may be organized in advanced engineering subjects upon approval of instructor in charge. Occasional field trips may be arranged.  
Mr. O'Neill in charge

**199A-199G. Special Studies. (1/2 to 2 courses)**

Prerequisite: senior standing and consent of the instructor. Individual investigation of a selected topic, to be arranged with a faculty member. Enrollment request forms are available in Department Offices. Occasional field trips may be arranged. May be repeated for bachelor's degree credit.

- 199A. Computer Science Department  
Staff in charge
- 199B. Electrical Sciences and Engineering Department  
Staff in charge
- 199C. Energy and Kinetics Department  
Staff in charge
- 199D. Engineering Systems Department  
Staff in charge
- 199E. Materials Department  
Staff in charge
- 199F. Mechanics and Structures Department  
Staff in charge
- 199G. System Science Department  
Staff in charge

**Graduate Courses****210A. Advanced Network Synthesis.**

Prerequisite: course 110B; 291A recommended. Introduction to n-port networks, network principles, matrix descriptions. Synthesis of n-ports having rational matrices. Advanced topics.

Mr. Cotter in charge

**210B. Linear Active Circuits.**

Prerequisite: course 210A. Fundamental concepts of linear active networks: passivity, activity and generativity. Theory of broad band and optimum matching. Negative impedance, parametric and feedback amplifiers.

Mr. Bauer in charge

**210C. Advanced Special Topics in Electric Circuits Theory.**

Prerequisite: courses 110C, 128A, 210A, 210B, 228A.

Mr. Levan in charge

**214A. Plasma Waves and Instabilities.**

Prerequisite: courses 100B, Physics 122. Wave phenomena in plasmas described by the macroscopic fluid equations. Microwave propagation, plasma oscillations, ion acoustic waves, cyclotron waves, hydro-magnetic waves, drift waves. Rayleigh-Taylor, Kelvin-Helmholtz, universal, and streaming instabilities. Application to experiments in fully and partially ionized gases.

Mr. Chen in charge

**214B. Principles of Thermonuclear Fusion.**

Prerequisite: Physics 122. Principles of confinement and heating of plasmas in magnetic fields. Field configurations: pinches, magnetic mirrors and wells, toruses. Methods of plasma stabilization. Plasma production and heating. Advantages of thermonuclear reactors and considerations in their design.

Mr. Chen in charge

**215A. Solid State Electronics I: Interaction of Fields and Solids.**

Prerequisite: courses 105B, 115B, 115C, 115A or 140A. Approximation methods in quantum mechanics, lattice vibrations, quantization of electromagnetic field, crystal field theory, interaction of radiation and atoms, magnetic resonance.

Mr. Viswanathan in charge

**215B. Solid State Electronics II: Electronic Conduction in Solids.**

Prerequisite: course 215A. Energy band theory, equilibrium in semiconductors and metals, transport properties, high frequency (microwave and optical frequencies) properties, superconductors.

Mr. Tao in charge

**215C. Solid State Electronics III: Quantum Electronics.**

Prerequisite: course 215A. Optical resonators, lasers (gases and solid state), optical properties of solids, Brillouin scattering, Raman scattering, frequency conversion.

Mr. Stafsuud in charge

**215D. Physics of Solid State Devices.**

Prerequisite: courses 115C and 115D or consent of the instructor. Physical principles and design considerations of modern solid state devices: minority carrier devices; field effect devices; optoelectronic devices; bulk effect devices; piezoelectric devices; magnetic devices.

Mr. Holm-Kennedy, Mr. Viswanathan in charge

**216A. Network Theory in Solid-State Electronics.**

Prerequisite: course 116B. Active network theory with particular reference to solid-state electronics. Design of multistage solid-state amplifiers for video, RF and IF; filter networks including negative impedance devices. Optimal system performance and device utilization. Integrated circuits, distributed networks and statistical network theory. Sensitivity considerations.

Mr. Willis in charge

**216B. Electronic Device Seminar.**

Prerequisite: course 116B. The critical examination of various electron devices with respect to their behavior and performance in system usage.

Mr. Simmons in charge

**216C. Electronic Systems.**

Prerequisite: courses 116C, 216A, 216B. Analysis and synthesis of electronic systems. System design as influenced by signal spectra, modulation forms and characteristics of the propagating media.

Mr. Willis in charge

**217A. Antennas I.**

Prerequisite: courses 117A, 117B, or Physics 210A, 210B. Dyadic Green's function, radiation from current elements, aperture antennas, excitation of guided waves.

Mr. Elliott in charge

**217B. Antennas II.**

Prerequisite: course 217A. Continuation of course 217A. Array theory, traveling wave antennas, reflector antennas and lenses, radio astronomy antennas.

Mr. Alexopoulos in charge

**217C. Guided Wave Structures.**

Prerequisite: course 217A. General properties of microwave networks, anisotropic and inhomogeneously filled waveguides, discontinuities in lossless cylindrical waveguide. Periodic structures and filters.

Mr. Schott in charge

**218A. Electron Motion and Interaction with Electromagnetic Fields.**

Prerequisite: courses 117A, 117B. Electron ballistics; space-charge wave theory; coupled mode theory. Traveling wave devices, cross-field devices.

Mr. Seeger in charge

**218B. Interaction of Electromagnetic Waves with Plasmas.**

Prerequisite: courses 117A, 117B. Motion of charged particles in fields, wave propagation in cold plasmas, antennas in plasmas, waves in warm plasmas, Alfvén waves, Boltzmann-Vlasov equations, Landau damping, longitudinal waves.

Mr. Yeh in charge

**218C. Scattering and Diffraction.**

Prerequisite: courses 217A, 217B. Integral and variational formulation for the scattered field, Rayleigh scattering theory, geometrical theory of diffraction, diffraction by simple objects, concepts of Holography.

Mr. C. Yeh in charge

**219A. Seminars on Advanced Topics in Electromagnetics.**

Prerequisite: courses 117A, 117B or equivalent. Current topics in electromagnetics, such as wave interaction with ferrites, moving media, data processing antennas, waves in statistically varying media, numerical methods applied to electromagnetic problems, holograms and partially coherent waves. May be repeated for credit. Staff, Electrical Sciences and Engineering Department in charge

**219B. Seminars on Advanced Topics in Solid State Electronics.**

Prerequisite: courses 215A, 215B, 215C. Current research areas, such as radiation effects in semiconductor devices, diffusion in semiconductors, optical and microwave semiconductor devices, nonlinear optics, and electron emission. Staff, Electrical Sciences & Engineering Department

**220A. Queuing Systems: Theory and Applications.**

(Same as Business Administration 216A.) Prerequisite: course 120C or consent of the instructor. Analysis of queuing (waiting line) systems. Discrete and continuous-time Markov processes; birth and death processes; equilibrium results for single and multiple server queues; method of stages. Priority queuing systems. Applications to communication systems; data-processing systems, time-shared processors, networks of computer and communication systems.

Mr. W. Chu, Mr. Kleinrock in charge

**220B. Advanced Queuing Theory and Applications.**

(Same as Business Administration 216B.) Prerequisite: course 220A. Advanced topics in queuing theory, including Lindley's integral equation. Pollaczek method, busy period and virtual waiting time. Method of collective marks. Inequalities and bounds in queuing theory. Tandem queues. An algebra for queues. Applications to communication nets, computer systems and time-sharing systems.

Mr. W. Chu, Mr. Kleinrock in charge

**220G. Graphs and Network Flows.**

Prerequisite: courses 120A and 129A or consent of the instructor. Solution to analysis and synthesis problems which may be formulated as flow problems in capacity constrained (or cost constrained) net-

works. Tools of network flow theory are developed using graph theoretic methods and are applied to communication, transportation and transmission problems.

Mr. Levan in charge

**222A. Nonlinear Control.**

Prerequisite: course 122B, or consent of the instructor. Classical, graphical and quasi-analytical techniques for designing and understanding nonlinear control systems, including Liapunov stability and Popov theory.

Mr. Wiberg in charge

**222B. Stochastic Control.**

Prerequisite: courses 120B and 122B. Linear stochastic systems, including proof of estimation/control separation theorem, and applications.

Mr. Aoki in charge

**222C. Optimal Control II.**

Prerequisite: course 122B. Applications of calculus of variations, Pontryagin's maximum principle, and dynamic programming to the standard problems of optimal control theory.

Mr. Mortensen in charge

**222D. Seminar in Control.**

Prerequisite: courses 222A, 222B and 222C, or consent of the instructor. A series of lectures and student presentations on topics of current research interest in control theory and applications. Recommended for advanced students who may wish to undertake doctoral dissertations in this field. May be repeated for credit.

Mr. Aoki in charge

**222E. Special Topics in Control.**

Prerequisite: consent of the instructor. Thorough treatment of one or more aspects of control theory and applications, such as: computational methods for optimal control; stability of distributed systems; identification; adaptive control; nonlinear filtering; differential games; applications to flight control, nuclear reactors, process control, biomedical problems. May be repeated for credit.

Mr. Wiberg in charge

**224A. Hybrid Computer Systems.**

Prerequisite: course 124D. The organization, operation and areas of application of analog-digital computer systems. Error analysis, numerical analysis aspects, digital simulation languages for continuous systems.

Mr. Karplus, Mr. McNamee, Mr. Nilsen in charge

**224B. Computer Applications: Distributed Parameter Systems.**

Prerequisite: course 124A. A survey of the mathematical formulation and computer solution of engineering field problems governed by partial differential equations. Discussion of analog and digital methods, including the use of modern problem-oriented languages.

Mr. Cardenas, Mr. Karplus, Mr. Vidal in charge

**225A. Computer System Design: Arithmetic Processors.**

Prerequisites: courses 125A, 125B. Concepts of number systems, digital numbers, algorithms; logic and organization of digital arithmetic processors; conventional arithmetic; algorithm acceleration; floating-point and significance arithmetics; redundant, signed-digit, residue number systems; error detecting codes for digital numbers; algorithm evaluation by analysis and simulation.

Mr. Avizienis, Mr. Svoboda in charge

**225B. Digital Computer Seminar.**

Prerequisite: course 225A. Advanced topics in computer system architecture. Analysis of programs, synthesis of systems performance measures. Formal description of complex systems.

Mr. W. Chu, Mr. Estrin in charge

**225C. Computer System Design: Fault Tolerance.**

Prerequisite: course 225A. Fault masking at the level of components, logic circuits, and subsystems. Diagnosis of logic nets. Techniques of automatic replacement and reorganization. Reliability estimation of fault-tolerant systems. Recovery from fault-induced errors. Mr. Avizienis, Mr. Klinger in charge

**225K. Advanced Topics in Programming Languages.**

Prerequisite: courses 125L and 125N or 123B (either of which may be taken concurrently). Recent developments in programming languages including syntax, semantics, and pragmatics. W-grammars and ALGOL 68. Definition of programming languages through symbolic machines. Description of programs as directed graphs.

Mr. Martin, Mr. Melkanoff in charge

**225L. Advanced Topics in Programming Systems.**

Prerequisite: course 125N or consent of the instructor. Theoretic models of compilation. Syntax-directed transduction, tree automata, and tree grammars. Parallel programs, including their structure and translation. Other topics of current research interest in the general field of design and implementation of computer programming languages.

Mr. Martin in charge

**225M. Pattern Recognition.**

Prerequisite: graduate standing. Theory of computer processing of patterned information. Applications to character recognition, nuclear experiment data (bubble chamber), and medical records (electrocardiograms). Threshold logic units, training algorithms, fuzzy sets. Hardware and software for input and display of graphic data.

Mr. Klinger, Mr. Melkanoff in charge

**225X. Advanced Computer Science Seminar.**

Prerequisite: completion of Major Field Examination in Computer Science or consent of the instructor. Current computer science research into theory of, analysis and synthesis of, and applications of information processing systems. Each member will complete one tutorial and one or more original pieces of work in his specialized area. May be repeated for credit. Mr. Estrin, Mr. Karplus in charge

**227A. Signal Detection Theory.**

Prerequisite: courses 120B and 127B. Applications of statistical decision theory to signal detection in radar and communication; coherent and noncoherent detection of known signals in noise; detection of stochastic signals; binary and multiple-signal digital communication; sequential detection.

Mr. Yao in charge

**227B. Advanced Theory of Information.**

Prerequisite: course 227A. Detailed proofs of coding theorems with application to digital communication; block, group, and convolutional codes; probabilistic and sequential decoding; rate-distortion theory; continuous information. Mr. Viterbi in charge

**227C. Advanced Filtering and Estimation.**

Prerequisite: courses 120B and 291A. Advanced methods of determination of optimal statistical estimators in communication systems problems.

Mr. Balakrishnan in charge

**227D. Seminars in Communication Systems.**

Prerequisite: courses 227A and 227B; and consent of the instructor. A series of lectures and student presentations on topics of current research interest in communication systems. Recommended for advanced students who may wish to undertake doctoral dissertations in this field. May be repeated for credit.

Mr. Viterbi in charge

**227E. Special Topics in Communication Systems.**

Prerequisite: consent of the instructor. Advanced topics in one or more special aspects of communication systems, such as phase-coherent communication systems, optical channels, time-varying channels, feedback channels, algebraic coding, etc. Content of the course varies from quarter to quarter. May be repeated for credit. Mr. Omura, Mr. Yao in charge

**228A. Foundations of Continuous-State System Theory.**

Prerequisite: courses 128A and 291A. Fundamental characterization of "state" for systems described in input-output sets, and consequences; relation to system identification problems.

Mr. Levan in charge

**228B-228C-228D. Theory of Finite Automata.**

Prerequisite: 228B, courses 128D and Mathematics 110A or 115; 228C, course 228B or consent of the instructor; 228D, courses 120A and 128D or equivalent. Linear machines and some of their applications. Algebraic theory of automata; decomposition. Theory and application of regular expressions. Probabilistic machines; realizations.

Mr. Carlyle in charge

**228E-228F-228G. Theory of Formal Languages and Automata.**

Prerequisite: course 123B or 128D or equivalent mathematical background recommended. Advanced topics in the theory of context-free languages and associated machines and decision problems. Abstract families of languages; balloon automata; special classes of machines. Computational complexity of languages; realtime computation, Turing machine hierarchies, time bounds on language recognition.

Miss Greibach in charge

**228J. Seminar in Automata and Languages.**

Prerequisite: three courses in the 228B-228C series, or consent of the instructor. A series of lectures and student presentations on topics of current research interest. Recommended for advanced students who may wish to undertake doctoral dissertations in this field. May be repeated for credit.

Miss Greibach in charge

**228K. Advanced Topics in Automata and Languages.**

Prerequisite: consent of the instructor. Thorough treatment of one or more selected topics, such as: identification, diagnosis; iterative arrays; stochastic languages; abstract complexity theory; finite automata on infinite trees; translations; Kolmogorov algorithmic theory of information and randomness. May be repeated for credit. Miss Greibach in charge

**229A. Numerical Techniques in Systems Optimization.**

Prerequisite: Mathematics 131A or equivalent; courses 128A, 129A is recommended. Computational methods for extrema of functionals on abstract spaces.

Mr. Balakrishnan in charge

**229B. Functional Analysis and Optimization.**

Prerequisite: courses 122B, 291A, Mathematics 265A, or equivalent, or consent of the instructor. Linear topological spaces; evolution operators; characterization of extrema of functionals; applications to optimal control and distributed systems.

Mr. Wang in charge

**229C. Stochastic Differential Systems.**

Prerequisite: courses 222B or 227C; 291A, Mathematics 265A, or consent of the instructor. Integration with respect to continuous-parameter martingales; Radon-Nikodym derivatives in metric spaces; applications to filtering and stochastic control.

Mr. Mortensen in charge

**229D. Seminar in System Theory.**

Prerequisites: three courses in the 220, 222, or 229 series, or consent of the instructor. A series of lectures and student presentations on topics of current research interest in system theory and applications. Recommended for advanced students who may wish to undertake doctoral dissertations in this field. May be repeated for credit. Mr. Balakrishnan

**229E. Special Topics in System Theory.**

Prerequisite: consent of the instructor. Thorough treatment of one or more selected topics in such areas as system optimization theory and numerical techniques, system identification, stochastic systems, finite graphs, network flows, queuing systems, etc. Content varies from quarter to quarter. May be repeated for credit.

Mr. Balakrishnan

**229J-229K-229L. Public Systems Analysis.**

( $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$  course)

Prerequisite: graduate standing or consent of the instructor. Exploration of the relevance of system science methodologies to research activities directed toward improvements in the systems that provide education, health care, transportation, communication, housing, environmental quality, and public safety services in urban areas.

Mr. Balakrishnan, Mr. O'Neill in charge

**230A. Applications of Statistical Thermodynamics.**

Prerequisite: course 130A. Development of methods of statistical thermodynamics within the framework of molecular theory of matter. Presentation of the role of spectra and intermolecular forces in the interpretation of thermodynamic properties of ideal systems, gases, solids, and plasmas.

Mr. Nobe in charge

**230B. Nonequilibrium Thermodynamics.**

Prerequisite: course 230A. Interpretation of nonequilibrium phenomena in terms of the Fourth Law of Thermodynamics, namely (a) linear interdependence of fluxes and driving forces and (b) Onsager reciprocal relations. Boltzmann transport equation; diffusion; electrical and heat currents; numerical calculation of parameters.

Mr. Bennion, Mr. Robinson in charge

**231A. Advanced Heat Transfer.**

Prerequisite: course 131B or consent of the instructor. Advanced topics on heat transfer from the current literature. Advanced methods for predicting transfer rates in turbulent or hydrodynamically unstable flows. Cellular convection, boiling, heat transfer in two-phase flow. Emphasis will change from year to year.

Mr. Catton in charge

**231B. Advanced Heat Transfer.**

Prerequisite: course 131B. Advanced topics on heat transfer from current literature. Advanced methods for predicting transfer rates in thermal radiation emitting, absorbing, and scattering media. Radiation transport properties of walls, gases, and clouds of particles. Simultaneous radiation, conduction, and convection in absorbing media.

Mr. Edwards in charge

**231C. Advanced Thermal and Luminous Radiation.**

Prerequisite: course 131C or equivalent. Radiative transfer in geometrically complex spaces; non-uniform radiant excitation and properties; spatial distribution of net transfer and radiance; non-gray spectral distributions; emphasis on matrix formulation; problems from current literature of space technology, heat transfer, illumination, colorimetry and photometry.

The Staff, Energy and Kinetics Department in charge

**231D. Application of Numerical Methods to Transport Phenomena.**

Prerequisite: course 131B, 132A or consent of the instructor. Numerical techniques for solving selected problems in heat and mass transfer. Applications include free convection, boundary layer flow, two-phase flow, separated flow, flow in porous media. Effects of concentration and temperature gradients, chemical reactions, radiation, electric and magnetic fields.

Mr. Denny in charge

**232A. Aerothermochemistry.**

Prerequisite: courses 132A or 137C. Fundamentals: change equations for multicomponent reactive mixtures; rate laws; dimensionless parameters and characteristic times. Relaxation phenomena: dynamic equation of state; sound absorption and dispersion; bulk viscosity; relaxation times and reaction-rate constants. Applications: flows with reactions. Macroscopic descriptions are emphasized.

Mr. Knuth in charge

**232B. Advanced Mass Transfer.**

Prerequisite: courses 131A, 132A. The formulation of the general convective heat and mass transfer problem including equilibrium and nonequilibrium chemistry. Similar and nonsimilar solutions for laminar flows; solution procedures for turbulent flows. Multicomponent diffusion. Application to the hyper-sound boundary layer, ablation and transpiration cooling combustion.

Mr. Mills in charge

**232C. Kinetic Theory and Molecular Flow.**

Prerequisite: course 130A. The molecular structure of gases; kinetic foundations of thermodynamics and gas-dynamics; physics of the upper atmosphere; aerodynamics in highly rarefied gases; gas-surface interactions; the Boltzmann equation; methods of analysis; experimental and theoretical results pertaining to the transitional flow regime; experimental techniques for research in rarefied gas dynamics.

Mr. Charwat in charge

**232D. Molecular Dynamics.**

Prerequisite: course 130A or 137C. Supersonic and effusive molecular-beam systems. Molecular-beam time-of-flight spectroscopy. Sampling techniques applied to studies of translational, rotational, vibrational and chemical relaxation processes. Gas-surface interactions: interaction potentials, mean residence times, energy accommodations, and scattering distributions.

Mr. Knuth in charge

**233A. Advanced Propulsion.**

Prerequisite: course 133A. Lagrange's ballistic problem. Propulsion analysis of the turbojet and ramjet engines. Rocket propulsion and stability of combustion processes in rocket engines. The selection of a propulsion device for accomplishing a specific mission.

Mr. Catto, Mr. Wazzan in charge

**234A. Topics in Thermal Design.**

Prerequisite: courses 131B, 132A. Consideration of thermal design problems selected from applications such as heat exchangers, heat shields, heat pipes, thermal environment control, spacecraft temperature control and solar thermal conversion. Presentations will be made by the Staff and occasionally by invited off-campus specialists.

Mr. Buchberg in charge

**235A. Nuclear Reactor Analysis: (Transport Theory).**

Prerequisite: course 135C. The analysis of nuclear reactor systems by analytical methods. Spatial and angularly dependent neutron transport theory in various approximations;  $P_n$ ,  $B_n$ ,  $S_n$ , and diffusion theory; the use of variational, Case, and Wiener Hopf methods.

Mr. Erdmann in charge

**235B. Nuclear Reactor Analysis (Energy Dependent Theory).**

Prerequisite: course 235A. The analysis of nuclear reactor systems by analytical methods. Energy dependent neutron transport theory; slowing down, resonance, and thermalization theory by analytical and numerical techniques. Perturbation theory. Neutron waves and pulses.

Mr. Erdmann in charge

**235C. Nuclear Reactor Analysis (Kinetics and Control).**

Prerequisite: course 235A. Time dependent behavior of nuclear reactor systems. Analysis of the reactor as a lumped and distributed parameter system by modern methods of control theory. Optimal control. Calculational methods: modal, nodal, synthesis and adiabatic techniques. Application to specific reactor systems.

Mr. Kastenberg in charge

**236A. Nuclear Reactor Engineering (Materials).**

Prerequisite: course 135C. Properties of materials used in nuclear reactors and effects of radiation on reactor materials; the testing, fabrication and metallurgy of (a) fissionable and nonfissionable fuels; (b) cladding, moderating, and coolant materials.

Mr. Hicks in charge

**236B. Nuclear Reactor Engineering (Systems).**

Prerequisite: course 135A. The major nuclear reactor systems, including nuclear power plants. Topics include thermal reactors, fast reactors, shielding optimization and design, energy removal, reactor safety, and economics.

Mr. Hicks in charge

**236C. Nuclear Reactor Engineering (Design).**

Prerequisite: course 135B. The design of nuclear reactors by analytical, experimental, and numerical methods. Study of nuclear reactor codes and handling of nuclear data. Numerical analogs of the differential equations governing reactor design.

Mr. Hicks in charge

**237A. Analysis and Design of Chemical Reactors.**

Prerequisite: course 137C. Principles of chemical kinetics, adsorption, and catalysis. Transport phenomena in reactor media. Optimal design of chemical reactors using dynamic programming, maximum

principle, and other optimization techniques. Transient behavior, stability analysis, and optimal control of chemical reactors.

Mr. C. Chu, Mr. Perrine in charge

**238A. Cryogenics.**

Prerequisite: course 138A. The study of basic phenomena in low temperature systems including the third law, various cooling methods and superfluid systems. Emphasis will be placed on low-temperature research and current developments.

Mr. Frederking in charge

**238B. Fundamentals of Electrochemical Kinetics.**

Prerequisite: one year physical chemistry or equivalent. Study of principles of electrode kinetics and other phenomena associated with metal-electrolyte interfaces. Some applications to engineering processes of current interest such as electrochemical energy conversion (i.e., fuel cells and batteries) and corrosion processes.

Mr. Bennion, Mr. Landolt, Mr. Nobe in charge

**238C. Principles of Electrochemical Engineering.**

Prerequisite: one year physical chemistry or equivalent. Transport phenomena in electrochemical systems: relationships between molecular transport, convection, and electrode kinetics will be discussed along with applications to industrial electrochemistry, fuel cell design, and modern battery technology.

Mr. Bennion, Mr. Landolt, Mr. Nobe in charge

**238D. Atomic and Molecular Collisions.**

Prerequisite: course 130A. Elastic scattering: classical theory (potential models, equations of motion); quantum theory (general relations for spherical potentials; some exactly treatable cases); approximate methods; resonance scattering; nonspherical potentials; multiple-potential interactions. Classical and semi-classical descriptions of inelastic and reactive scattering.

Mr. Helbing in charge

**239A. Seminar: Thermodynamics of Phase Transitions.**

Prerequisite: course 130A. Review of current literature in an area of thermodynamics in which the instructor has developed special proficiency as a consequence of research interests. Student reports on selected topics.

Mr. Robinson in charge

**239B. Seminar: Current Topics in Transport Phenomena.**

Prerequisite: consent of the instructor. Review of current literature in an area of transport phenomena in which the instructor has developed special proficiency as a consequence of research interests. Student reports on selected topics.

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**239C. Seminar: Current Topics in Energy Utilization.**

Prerequisite: consent of the instructor. Review of current literature in an area of energy utilization in which the instructor has developed special proficiency as a consequence of research interests. Student reports on selected topics.

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**239D. Seminar: Current Topics in Nuclear Engineering.**

Prerequisite: consent of the instructor. In odd-numbered years, reactor design will be discussed. In even-numbered years, current literature in an area

of nuclear engineering in which the instructor has developed special proficiency as a consequence of research interests will be reviewed.

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### 239E. Seminar: Current Topics in Chemical Engineering.

Prerequisite: consent of the instructor. Review of current literature in an area of chemical engineering in which the instructor has developed special proficiency as a consequence of research interests. Student reports on selected topics.

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### 241. Oxidation of Metals.

Prerequisite: course 141, equivalent, or consent of the instructor. The kinetics and mechanism of gas-solid reactions. Adsorption and phase-boundary reactions. Nucleation of reaction products, defect structure of oxides, crystal structure and morphology of oxide films, factors influencing adherence of surface films.

Mr. Douglass in charge

### 242A. Plasticity Theory Applied to Metal Working I.

Prerequisite: course 158A. Fundamental concepts describing the mechanics of plastic deformation of homogeneous solids. Yield criteria. Methods of solution, including slip line field, of problems involving plastic deformation, with examples involving plane strain and axisymmetric deformation. Extrusion problem. Application of methods of solution.

Mr. Shabaik in charge

### 242B. Plasticity Theory Applied to Metal Working II.

Prerequisite: course 242A. Discussion of various metal working processes and the application of the theory of plasticity to the study of the mechanics. Includes drawing extrusion, forging, rolling with references to newer developments such as cold forging of steel and hydrostatic extrusion.

Mr. Shabaik in charge

### 243. Fracture of Structural Materials.

Prerequisite: course 158A or equivalent. The engineering and scientific aspects of crack nucleation, slow crack growth and unstable fracture. Fracture mechanics, dislocation models, fatigue, fracture in reactive environments, alloy development, fracture-safe design.

Mr. Tetelman in charge

### 244. Electron Microscopy.

Prerequisite: course 145A or equivalent. Essential features of the electron microscope, geometry of electron diffraction, kinematical and dynamical theories of electron diffraction including anomalous absorption, applications of theory to defects in crystals, Moiré fringes, direct lattice resolutions, Lorentz microscopy, laboratory applications of contrast theory.

Mr. Ardell in charge

### 245A. Theory of Imperfections.

Prerequisite: course 158A. Advanced topics in theory of lattice defects: continuum and atomistic treatments of point defects, dislocations and planar faults; interactions between various defects; selected applications to physical and mechanical behavior of solids.

Mr. Ono, Mr. Simes in charge

### 245B. Electrons in Metals.

Prerequisite: an introductory course in atomic physics and wave mechanics such as course 140A, Physics 121 or 115. A study of the thermal, electrical and thermo-electrical properties of metals which are based on the energies of electrons. The prediction of alloy phases.

Mr. Wazzan in charge

### 245D. Magnetic Interactions in Solids.

Prerequisite: courses 140B, 245B, or consent of the instructor. The characteristic properties of magnetically ordered solids. Origin of magnetism in atoms and ions. The molecular-field models of ordered magnetic solids. Exchange interactions between two electrons. Exchange interactions in solids. The excited states and statistical mechanics of ordered magnetic solids.

Mr. Robinson, Mr. Wazzan in charge

### 246A. Mechanical Properties of Nonmetallic Crystalline Solids.

Prerequisite: course 146A. Material and environmental factors affecting the mechanical properties of nonmetallic crystalline solids, including atomic bonding and structure, atomic-scale defects, microstructural features, residual stresses, temperature, stress state, strain rate, size, and surface conditions. Methods for evaluating mechanical properties.

Mr. MacKenzie, Mr. Sines in charge

### 246B. Structure and Properties of Glass.

Prerequisite: course 146A. Structure of amorphous solids and glasses. Conditions of glass formation and theories of glass structure. Mechanical, electrical and optical properties of glass, and relationship to structure.

Mr. MacKenzie in charge

### 246C. Equilibria of Ceramic Materials at Elevated Temperatures.

Prerequisite: courses 141, 146A. Methods for measuring thermodynamic properties of materials at elevated temperatures. Thermodynamics of melts, including molten metals, ionic salt melts, oxide and silicate melts. Applications in binary systems comprised of oxides. Relationship to phase diagrams and their construction.

Mr. Klement in charge

### 246D. Electronic and Optical Properties of Ceramics.

Prerequisite: course 146A. Principles governing electronic properties of ceramic single crystals and glasses and effects of processing and microstructure on these properties. Electronic conduction, ferroelectricity, and photochromism. Magnetic ceramics. Infrared, visible, and ultraviolet transmission. Unique application of ceramics.

Mr. MacKenzie in charge

### 247A. Solid State Reactions.

Prerequisite: course 142. Phenomenology and atomistic mechanisms of solid-state diffusion. Nucleation theory. Theory of diffusional growth processes, kinetics of diffusional transformations in solids. Precipitation in solids. Spinodal decomposition.

Mr. Douglass in charge

### 247B. Advanced Solid-State Transformations.

Prerequisite: course 247A. Classical theories of precipitate nucleation and growth, spinodal decomposition, cellular precipitation, entectoid decomposition, massive transformations, crystallography and kinetics of martensitic transformations, order-disorder transformations, particle coarsening, role of imperfections in precipitation.

Mr. Ardell, Mr. de Fontaine in charge

### 247C. Advanced Solidification.

Prerequisite: course 247A or equivalent. Liquid state concept of constitutional supercooling; nucleation from the liquid phase; solute redistribution during liquid-solid transformation; fluid motion; interface morphology; eutectic growth; determination of phase diagrams; student reports on current topics in solidification.

Mr. Yue in charge

**248A. Experimental Methods in Materials Research.**

Prerequisite: a bachelor's degree in chemistry, physics or engineering. A survey of the techniques used in materials research in vacuum techniques, methods of heating and quenching, consolidation and refining of metals, crystal growth, thin film deposition, fabrication, powder metallurgy, and special machining methods.

Mr. Bumshah in charge

**250A. Advanced Fluid Mechanics: Foundations.**

Prerequisite: course 150A or equivalent, or consent of the instructor. Rigorous development of basic equations and theorems governing the motion of a fluid. Physical properties of fluids, kinematics of the flow field, governing equations, vorticity dynamics. Exact solutions of the Navier-Stokes equations. Low Reynolds number flows.

Mr. Meecham in charge

**250B. Advanced Fluid Mechanics: Flow at Large Reynolds Number.**

Prerequisite: course 150A or equivalent or consent of the instructor. Discussion of fluid phenomena occurring at large Reynolds numbers. Boundary layer theory for incompressible and compressible flow, using matched asymptotic expansions. Separation. Turbulent shear flows. Advanced topics in irrotational flow. Effectively inviscid flows with vorticity.

Mr. Charwat in charge

**250C. Wave Motion and Hydrodynamic Stability.**

Prerequisite: course 150A or consent of the instructor. Discussion of wave propagation in fluids, illustrated especially by the dynamics of gravity waves. Free and forced motion; nonlinear effects. Survey of mechanisms through which waves grow spontaneously, with special emphasis placed on conversion of energy from a mean flow.

Mr. Kelly in charge

**250D. Stratified and Rotating Fluids.**

Prerequisite: course 150A or consent of the instructor. The influence of body forces upon fluid flows, as illustrated by problems with technical or geophysical importance. Flow past a body of finite dimensions: lee wave phenomena and upstream blocking. Sink flow. Gravity currents. Vortex breakdown. Boundary layer behavior.

Mr. Kelly in charge

**251A. Advanced Gas Dynamics.**

Prerequisite: course 150B or equivalent; or consent of the instructor. Topics include supersonic flow over bodies of revolution, similarity rules, transonic flows, and the mathematical foundation and application of the method of characteristics.

Mr. Lui in charge

**251B. Hypersonic Aerodynamics.**

Prerequisite: course 251A. The hypersonic limit for particle and for continuum flow is discussed. Analytical approximations and numerical methods. Viscous effects. The re-entry problem.

Mr. Charwat in charge

**251C. Aerodynamics.**

Prerequisite: courses 150A, 150B, or consent of the instructor. Application of the fundamental laws and methods of incompressible flow to configurations important for aircraft and spacecraft. Introduction to stability and control problems of the flight inside the atmosphere.

Mr. Spaid in charge

**252A. Engineering Magneto-hydrodynamics.**

Prerequisite: courses 117B and 250A or consent of the instructor. Continuum theory of the motion of a conducting fluid in a magnetic field; typical solutions for incompressible and compressible flow; elements of the theory of conductivity in a plasma; propulsion and power generation applications.

Mr. Meecham in charge

**252B. Theory of Turbulence.**

Prerequisite: courses 150A, 150B or 250A or 250B or consent of the instructor. Correlation tensors. Karman-Howarth equations. Major theories of turbulence: Heisenberg, zero-fourth-cumulant, Kolmogoroff; modern theories. Mixing-length theories.

Mr. Meecham in charge

**253A. Fundamentals of Aeroacoustics.**

Prerequisite: course 150A or consent of the instructor. Detailed discussion of plane waves, point sources. Nonlinearity, layered and moving media, multiple reflections. Inhomogeneous wave equation. Monopole, dipole, quadrupole source fields from scattering inhomogeneities and turbulence; Lighthill's theory. Moving sources. Similarity methods. Selected detailed applications.

Mr. Meecham in charge

**253B. Advanced Topics in Aeroacoustics.**

Prerequisite: course 253A. Further developments to treat selected items such as noise generation by turbulent or supersonic jets, rockets, subsonic and supersonic boundary layers, shockwave interactions, whistles, atmospheric and underwater aspects, sonic "boom," structural response to random fluid pressures, introduction to aerothermoacoustics.

Mr. Meecham in charge

**253C. Advanced Topics in Engineering Acoustics.**

Prerequisite: course 153A or consent of the instructor. Further developments to treat selected items in the areas of architectural acoustics and noise control, underwater acoustics, and ultrasonic propagation in materials. Course content will depend to an extent on the interests of each student.

Mr. Stern in charge

**253D. Sound and Vibration.**

Prerequisite: course 153A or 155A, or consent of the instructor. Theoretical analysis of the interaction of sound and structures; acoustic transmission through fluid layers and walls; structural wave propagation; multidimensional random processes using wave number and frequency space; response and radiation of infinite and finite structures; statistical energy analysis.

Mr. Meecham in charge

**254A. Experimental Techniques in Aerodynamics.**

Prerequisite: course 251A. Theoretical foundations of experimental equipment and instruments used in aerodynamic research. Subsonic, supersonic and hypersonic wind tunnel design and practice. Hot-shot, shock-tube and gun-tunnel—the course will include laboratory practice—evaluation of data and design of experiments.

Mr. Charwat, Mr. Spaid in charge

**255A. Advanced Dynamics.**

Prerequisite: courses 155 and 169A, or consent of the instructor. Variational principles and Lagrange's equations. Kinematics and dynamics of rigid bodies; precession and nutation of spinning bodies.

Mr. Forster in charge

**255B. Advanced Dynamics.**

Prerequisite: course 255A. Variations of Lagrange's equations involving quasio-ordinates; properties of the Hamiltonian; Hamilton's equations; canonical transformations; the Hamilton-Jacobi equation and its solution by exact and approximate methods; analytical dynamics for continuous systems. Mr. Likins in charge

**256A. Mechanics of Deformable Solids I.**

Prerequisite: course 158A or consent of the instructor. Stress and strain tensors, indicial notation, compatibility conditions, equations of motion. Work and energy, uniqueness of solution and extremum principles. Constitutive laws of isotropic elastic solids, thermoelasticity, linear viscoelasticity and incremental plasticity. Mr. Lin, Mr. Muki, Mr. Westmann in charge

**256B. Mechanics of Deformable Solids II.**

Prerequisite: course 256A or consent of the instructor. Systematic solution of three-dimensional isotropic problems; analysis of anisotropic solids and effects of large strains. Typical applications. Mr. Muki in charge

**256D. Theory of Disks and Plates.**

Prerequisite: course 256A or consent of the instructor. Reversible and irreversible deformation of disks; small and large deflections of elastic plates; thick plates; anisotropic plates; sandwich plates; irreversible deflections of plates; stable and unstable deformations to be considered; typical applications. Mr. Hu, Mr. Roberts in charge

**256E. Theory of Shells.**

Prerequisite: course 256A or consent of the instructor. Elements of differential geometry of surfaces; membrane and bending theory of shells; application to cylindrical, spherical, conical shells, and other shells with rotational symmetry; large deflection of shells; irreversible deflection of shells; stable and unstable deformations to be considered; typical applications. Mr. Hu, Mr. Roberts in charge

**257A. Elasticity.**

Prerequisite: courses 158A and Mathematics 132 or consent of the instructor. Solutions within classical elastostatics and linear viscoelasticity for problems of torsion and flexure of beams and for some fundamental two-dimensional problems (plane stress and plane strain). Approximative methods of solution will also be discussed. Mr. Muki in charge

**257B. Plasticity.**

Prerequisite: course 158A or consent of the instructor. Mathematical and physical theories of plasticity and their limitations, analogy between inelastic strain gradient and body force in a continuous medium, simple inelastic structures as inelastic beams, shafts, spherical shells, thick cylinders, rotating disks and cylinders, plastic hinges in rigid frames and visco-elastic bodies. Mr. Ito, Mr. Lin in charge

**258A. Continuum Mechanics I.**

Prerequisite: courses 256A or 257A, 291A, or consent of the instructor. Bodies. Motions: referential, spatial and relative description; polar decomposition theorem. Cauchy-Green, stretching spin, (vorticity), stress, and couple-stress tensor. Balance principles, mass, linear and angular momentum energy. Entropy production. Mr. Morgan in charge

**258B. Continuum Mechanics II.**

Prerequisite: course 258A. Principle of constitutive invariance. Material symmetries. Simple fluids and solids, sub-fluids, liquid crystals. Thermodynamics of simple materials; the Clausius-Duhem inequality. Elastic (nonlinear) materials: problems of equilibrium, exact solutions. Contact with classical linear elasticity theory. Mr. Morgan in charge

**258C. Wave Propagation in Solids I—****Theoretical Seismology.**

(Same as Planetary and Space Sciences 224A.) Prerequisite: course 158A or 159A, or consent of the instructor. Elastic wave equation and elementary solutions; wave motions in elastic half-spaces; reflection and refraction of elastic waves; surface waves; vibrations of rods and plates. Mr. Mal in charge

**258D. Wave Propagation in Solids II—****Theoretical Seismology.**

(Same as Planetary and Space Sciences 224B.) Prerequisite: consent of the instructor. Wave propagation in layered media; Green's functions for various geometries; diffraction and scattering of elastic waves; attenuation; inversion problems. Mr. Mal in charge

**259A. Seminar on Advanced Topics in Fluid Mechanics.**

Prerequisite: consent of the instructor. To study advanced topics in fluid mechanics with intensive student participation, involving assignments in research problems leading to a term paper or an oral presentation and possible help from guest lecturers. Mr. Charwat, Mr. Gazley in charge

**259B. Seminar on Advanced Topics in Solid Mechanics.**

Prerequisite: consent of the instructor. Advanced study in various fields of solid mechanics on topics which may vary from term to term. Topics cover dynamics, elasticity, plasticity and stability of solids. Mr. Lin, Mr. Morgan, Mr. Westmann in charge

**260A. Celestial Mechanics.**

Prerequisite: course 160A or consent of the instructor. Perturbation theory, the n-body problem; numerical integration; special perturbations; the methods of variation of parameters and perturbative differentiation; conservative forces: the potential function and the methods of Hamiltonian mechanics. Mr. Herrick in charge

**260B. Celestial Mechanics.**

Prerequisite: course 260A. The attraction of a spheroid; the gravitational field of the earth and the geodetic constants; the theory and development of general perturbations; the small-divisor problem. Mr. Herrick in charge

**260C. Non-Gravitational Astrodynamics.**

Prerequisite: course 160A. Advanced problems in celestial mechanics emphasizing non-gravitational and relativistic effects. Mr. Forster in charge

**261A. Advanced Orbit Theory.**

Prerequisite: course 160B. Preliminary orbits based on the Lagrange-Gauss-Gibbs first approximation; interception orbits; partial differential coefficients by analytical and by numerical methods; selection of parameters, variables, and formulae to suit the requirements of various space-orbit determinations. Mr. Herrick in charge



**262A. Stability and Control for Atmospheric Flight.**

Prerequisite: courses 122A or 171A; 155 or equivalent; 251C or consent of the instructor. Basic stability and control concepts for flight within the atmosphere, static stability and control, application to aircraft and missiles of rigid body dynamical equations, stability derivatives, stability of uncontrolled motion, response to control actuation.

Mr. Forster in charge

**262B. Advanced Problems in Aerospace Vehicle Dynamics and Control.**

Prerequisite: consent of the instructor. Advanced problems of current interest in aerospace vehicle dynamics, navigation and guidance, rotational stability and control. Seminar format with student participation in review of current literature and consideration of possible new problem solutions and system concepts.

Mr. Forster in charge

**263A. Dynamic Analysis.**

(Formerly numbered 263B.) Prerequisite: course 255A. Concepts of stability; state space interpretation; stability determination by simulation, linearization, and Liapunov's Direct Method; the Hamiltonian as a Liapunov function; nonautonomous systems; averaging and perturbation methods of nonlinear analysis; parametric excitation and nonlinear resonance. Application to mechanical systems.

Mr. Mingori in charge

**263B. Space Vehicle Dynamics.**

(Formerly numbered 263A.) Prerequisite: courses 255A, 263A. Advanced rotational dynamics of space vehicles; environmental torques; spin stabilization and gravity stabilization; matrix equations of motion for systems of coupled rigid bodies, and for rigid bodies with flexible appendages. Current topics in space vehicle dynamics and attitude control.

Mr. Likins in charge

**264A. Navigation and Guidance Systems.**

Prerequisite: courses 122A or 171A; 160A, 255A. Basic concepts of navigation and guidance, automatic terrestrial guidance cruise vehicles, short and long range missiles, spacecraft, inertial guidance concepts and instrumentation, guidance error analysis techniques.

Mr. Forster in charge

**264B. Aerospace Vehicle Navigation and Guidance Systems.**

Prerequisite: course 264A. Conceptual and practical methods for the navigation and guidance of aerospace vehicles, with emphasis on error sources and error propagation, within the framework of special mission segments and corresponding guidance operations, e.g., boost and injection, rendezvous, planetary approach, etc.

Mr. Forster in charge

**265A. Advanced Structural Analysis I.**

Prerequisite: course 165B. Analysis of structural systems by energy methods; relaxation and iteration methods. Matrix methods as applied to beams and frames; analysis by substructures. Effects of thermal expansion, lack of fit, settling.

Mr. Selma in charge

**265B. Advanced Structural Analysis II.**

Prerequisite: courses 166, 265A or consent of the instructor. Matrix methods applied to analysis of frames, plates, shells. Finite elements in two and three dimensions. Applications to stress, deflection, stability analysis. Dynamic behavior of structures.

Mr. Rubinstein in charge

**265C. Advanced Structural Analysis III.**

Prerequisite: course 265B. Matrix methods (finite elements) applied to nonlinear systems. Material nonlinearity and geometric nonlinearity. Interpolation formulas in finite element characterization. Use of gradient methods in analysis and design.

Mr. Rubinstein in charge

**266A. Stability of Structures I.**

Prerequisite: courses 165B, 166 or equivalent. Elastic buckling of bars. Different approaches to stability problems. Inelastic buckling of columns and beam columns. Columns and beam columns with linear, nonlinear creep. Combined torsional and flexural buckling of columns. Buckling of plates.

Mr. Dong, Mr. Nelson in charge

**266B. Stability of Structures II.**

Prerequisite: course 266A. Continuation of the structural stability theory of course 266A, applied to rings, plates, and shells, dynamic stability of elements subject to transient and periodic forces.

Mr. Dong, Mr. Nelson in charge

**267A. Optimum Structural Design.**

Prerequisite: course 165B. Principles of structural design for minimum weight or cost; relationship between material properties and structural configuration; prediction of weight of structure; relative merits of different materials; analysis of nonoptimum factors; application to aerospace and civil structures.

Mr. Felton in charge

**267B. Advanced Structural Design.**

Prerequisite: courses 165B, 167. Design of steel frames by linear programming; probability and statistics related to the study of reliability of structural systems. Economic considerations in design. Application of optimization principles in structural design.

Mr. Felton, Mr. Rubinstein in charge

**268A. Experimental Structural Analysis.**

Prerequisite: course 166. Study of the principal experimental methods of structural analysis including model analysis and similitude, mechanical and electrical strain measurements, dynamic response measurements, photoelastic and photostress measurements, Moiré method. Laboratory work is included.

Mr. Matthiesen in charge

**268B. Failure of Structural Systems.**

Prerequisite: course 165B. Philosophy of structural safety. Principles of design for prevention of failure (other than buckling). Fatigue, brittle failure, delayed cracking, creep, design of efficient joints, environmental effects. Emphasis on current problems in actual structures.

Mr. Felton, Mr. Sines in charge

**268C. Theory of Reinforced Concrete Structures.**

Prerequisite: courses 265B, 256D, or consent of the instructor. Physical and mechanical properties of plain concrete. Bonding of reinforcing steel, and cracking. Behavior of columns, beams, torsional elements, slabs and shells of reinforced concrete. Studies of complex reinforced concrete structures using modern techniques of applied mathematics.

Mr. Selma in charge

**269A. Dynamics of Structures.**

Prerequisite: course 169A. Principles of dynamics. Determination of normal modes and frequencies by differential and integral equation solutions. Transient and steady state response. Emphasis on derivation and solution of governing equations using matrix formulation.

Mr. Wolf in charge

**269B. Advanced Dynamics of Structures.**

Prerequisite: courses 265A, 269A. Analysis of linear and nonlinear response of structures to dynamic loadings. Stresses and deflections in structures. Structural damping and self-induced vibrations. Mr. Hurty in charge

**269C. Probabilistic Dynamics of Structures.**

(Formerly numbered 269B.) Prerequisite: course 269A. Response of structural systems to stochastic excitations. Single and multiple random forces. Discrete and continuous structures with linear and nonlinear materials. Stationary and nonstationary excitations. Probabilistic eigenvalues and eigenfunctions. Applications to civil and aerospace structures. Mr. Hart in charge

**270A. Synthesis of Engineering Systems.**

Prerequisite: course 172A or 179B; graduate standing in engineering. The logic and quantitative tools of synthesizing engineering systems. Needs and environment analysis leading to constraints, specifications, design concepts and design criteria. Physical realizability, economic justification, and financial feasibility. System stability, sensitivity and subsystem compatibility. Mr. Asimow in charge

**270B. Dynamic Elements of Operational Systems.**

Prerequisite: course 193A, functional transform and network theory, linear algebra or consent of the instructor. Basic theoretical models applicable to general large-scale stochastic systems. Linear-system approximations. Applications to a wide range of system types. Mr. J. L. Barnes in charge

**271A. Optimal Control of Dynamic Systems.**

Prerequisite: course 171C, or 122B or consent of the instructor. Formulation of optimal control problem, dynamic equations, and performance indices. Variational theory of the optimization of dynamic systems, first and second order necessary conditions for optimality, first and second order computational methods, sufficient conditions and fields. Mr. Leonard in charge

**271B. Dynamics and Control of Stochastic Engineering Systems.**

Prerequisite: courses 120A or equivalent; 171C or 122B. Estimation of correlation function and spectral density, error analysis techniques, sequential estimation and filtering, control of stochastic systems. Application to analysis and design of stochastic engineering systems. Mr. Leonard in charge

**271C. Identification and Adaptive Control of Engineering Systems.**

Prerequisite: courses 271A, 271B. Methods for generating valid mathematical models of engineering systems. Parametric and nonparametric methods. Combined identification and control, adaptive control. Mr. Leonard in charge

**271D. Advanced Topics in Dynamics and Control of Engineering Systems.**

Prerequisite: courses 271A, 271B. Advanced topics in the dynamics and control of engineering systems. Topics to be selected from the areas of distributed parameter systems, differential games, multilevel control systems, etc., with application to engineering systems. Mr. Leonard in charge

**272A. Stochastic Models and Decision Theory.**

(An extension of but not the same as course 270B.) Prerequisite: course 172A. Stochastic models in

operations research including Poisson processes, queueing models, stochastic inventory models, renewal and replacement problems, Monte Carlo simulation, decision theory including Markovian decision problems, policy iteration methods, adaptive and steady-state techniques in continuous and discrete time. Mr. Jacobsen, Mr. Wismer in charge

**272B. Network Flow Theory and Programming Techniques.**

(An extension of but not the same as course 270B.) Prerequisite: course 172B. Network flow theory including linear graph theory, maximum flow problems, multicommodity flow, and multiterminal analysis. Computational methods including integer programming, implicit enumeration, branch and bound techniques and their application to sequencing, warehousing, and materials handling problems. Mr. Jacobsen, Mr. Wismer in charge

**272C. Optimization Methods for Large-Scale Systems.**

Prerequisite: course 172B. Theoretical aspects of static and dynamic optimization problems particularly as related to systems having high dimensionality. Kuhn-Tucker theory, duality, decomposition, aggregation. Solution of two-point boundary value problems, generalized linear programming, convex programming, and applications to large-scale systems. Mr. Wismer in charge

**272D. Advanced Topics in Operations Research and Large-Scale Systems.**

Prerequisite: courses 272A, 272B, 272C or consent of the instructor. Advanced topics of current interest in operations research chosen from among identification and optimization problems for static and dynamic systems, sensitivity theory, aggregation and decomposition of stochastic systems, controllability, resource allocation, modeling techniques and other topics. Mr. Leonard in charge

**275A. Statistical Design of Engineering Experiments**

(Same as Business Administration 215F.) Prerequisite: courses 193A, 193B. Matrix treatment of linear hypotheses in engineering experimentation. Statistical estimation, tests of hypotheses, analysis of variance, regression models. Randomized blocks, factorial, Latin square, multiple factor and level experiments. Principles of orthogonality, confounding, fractional replication, incomplete block designs with engineering applications. Mr. Coleman in charge

**275B. Selected Topics in Engineering Statistics.**

Prerequisite: courses 193A, 193B or equivalent. Fundamentals of probability measures, sets. Topics vary from year to year from sequential analysis of statistical data, stochastic service functions, queueing theory, work sampling, mathematical simulation studies, multidimensional Gaussian, associated measurements. Evolutionary operations and response surface methodology. Applications and reports. Mr. Coleman in charge

**275C. Stochastic Processes in Linear Systems.**

Prerequisite: course 193A, functional transforms in linear systems, and B.S. degree in engineering, physics, or mathematics, or consent of the instructor. Formulation and solution of equations of behavior of lumped and distributed linear electrical, rigid- and fluid-mechanical, and thermal systems with stochastic (i.e., chance) excitation, or system change, and response. Emphasis on functional transform methods, and on duality. Mr. J. L. Barnes in charge

**277A. Economic Evaluation of Engineering Systems.**

Prerequisite: courses 106B, 177A. Evaluation of economic feasibility of large scale engineering systems. Projections of future economic environment, growth of demand, planned expansion of the system. Techniques establishing profitability. Risk evaluation. Methods of financing. Term project.

Mr. English in charge

**277B. Economics of the Engineering Function.**

Prerequisite: graduate standing. Economics of engineering tasks. Organization of the engineering of a system, costs of analytical evaluations for establishing levels of confidence in the results. Use of resources. Engineering time accounting and relationship to capital investment. New concepts of engineering economic analysis.

Mr. English in charge

**278A. Advanced Kinematics.**

Prerequisite: course 178A. Analysis and synthesis of mechanisms with special emphasis on space mechanisms. Both graphical (vector) and analytical (matrix) methods are used. The dynamics of mechanisms in a space vehicle are discussed. The kinematics of geometrical optics are treated using matrices.

Mr. Beggs in charge

**280A. Advanced Biotechnology.**

Prerequisite: course 180A or 180B or consent of the instructor. Review and analysis of contemporary bioscience research which bears on problems of engineering component and system design. Emphasis is on methodological and scientific factors underlying man-machine-environment interactions.

Mr. Lyman in charge

**280B. Advanced Biotechnology.**

Prerequisite: course 180A or 180B or consent of the instructor. Specialized coverage of "human factors" and "human engineering" with orientation toward obtaining design optimization of the functions of humans in relation to engineering parameters of environment, communication and control.

Mr. Lyman in charge

**283A. Theory of Flow Through Porous Media.**

Prerequisite: course 183A or consent of the instructor. Theory of miscible and immiscible fluid displacement processes within porous media; derivation and solution methods for equations describing flow; appropriate linearization of flow equations, representation as a hyperbolic system, numerical solutions, problems in stability or fingering, statistical hydrodynamics, capillarity.

Mr. Perrine in charge

**284A. Surface Water Hydrology.**

Prerequisite: course 184A or consent of the instructor. Theory of the movement and occurrence of water over the surface of the earth. Analysis of hydrologic systems, frequency analysis of rainfall and runoff, flood hydrographs and flood routing, legal aspects of surface water, computer applications.

Mr. W. Yeh in charge

**284B. Ground Water Hydrology.**

Prerequisite: course 184A or consent of the instructor. Theory of the movement and occurrence of water in subterranean aquifers, hydrodynamics of flow through porous materials, quality of ground water, legal aspects of ground water, and computer applications. Conjunctive management of ground water basins.

Mr. Perrine in charge

**284C. Water Resources Systems Engineering.**

Prerequisite: course 179A or consent of the instructor. Deterministic and probabilistic analysis of hydrologic, water supply and waste water treatment systems using mathematical techniques such as simulation, linear and dynamic programming and queueing theory. Conjunctive utilization of surface water and ground water systems.

Mr. Dracup in charge

**284E. Saline Water Conversion.**

Prerequisite: course 137A and Chemistry 110AB or equivalent. Current research and development in saline water conversion, in the fields of distillation, electrodialysis, freezing, reverse osmosis and chemical extraction. A study of process optimization and economics of combined water power systems.

Mr. McCutchan in charge

**284F. Selected Topics in Water Resources.**

(½ course)

Prerequisite: graduate status; consent of the instructor. In successive quarters course will deal with topics such as: water supply systems, hydraulic and structural problems, water quality management, and water law and institutions. May be repeated twice for credit.

Mr. Pillsbury in charge

**284G. Engineering Economics of Water and Related Natural Resources.**

Prerequisite: course 106A or consent of the instructor. Engineering economic theory of the development and allocation of water and related natural resources; analytical techniques for planning and public policy formulation in regional water resources development; related institutional considerations in planning and development of water resources programs.

Mr. Mobasher in charge

**285A. Analytical Soil Mechanics.**

Prerequisite: course 185A. Advanced concepts in the following soil mechanics areas: physical chemical properties, shear strength, seepage, stability of slopes, earth dam design and soil-earthquake problems.

Mr. Lee in charge

**285B. Foundation Engineering.**

Prerequisite: course 185A; course 285A recommended. Principles of foundation design; theory of consolidation; impeded drainage; stress distribution; settlement analysis; allowable building settlements; methods of minimizing settlements; lateral earth pressures; allowable bearing capacity for shallow and deep foundations; design of anchored bulkheads.

Mr. Singh in charge

**285C. Soil Dynamics.**

Prerequisite: course 185A; graduate standing. The basic concepts of the behavior of soil under dynamic loads is presented with special application to the problems of design of soil structures and foundations to resist earthquake loading conditions.

Mr. Lee in charge

**285D. Earth Pressures and Earth****Retaining Structures.**

Prerequisite: course 185A; graduate standing. The basic concepts of the theory of earth pressures behind retaining structures is presented with special application to the design of retaining walls, bulkheads and excavation bracing; the effects of flexibility of bulkheads, creep in soils and construction techniques are also discussed in detail.

Mr. Singh in charge

**286A. Earthquake Engineering.**

Prerequisite: courses 258A or 265A or 285A or 155A. Engineering seismology: strong earthquake motion, microtremors, wave velocity and damping, induced vibrations, spectral analysis. Risk of earthquakes and fault breaks. Site evaluation. Structure-earth system response. Introduction to earthquake resistive design of buildings, bridges and dams. Theory and field experiments.

Mr. Duke, Mr. Jenschke, Mr. Matthiesen in charge

**286B. Structural Response to Ground Motions.**

Prerequisite: course 269A or consent of the instructor. Spectral analysis of ground motions: response, time and Fourier spectra. Response of structures to ground motions due to earthquakes and nuclear explosions. Computational methods to evaluate structural response. Response analysis including evaluation of contemporary design standards. Limitations due to idealizations.

Mr. Jenschke in charge

**287A. The Theory of Road Traffic Flow.**

Prerequisite: courses 192AB, 193A. Study of various mathematical theories of road traffic; fundamental diagram of traffic; dynamical theories of traffic; follow-the-leader models of traffic flow; hydrodynamic models of traffic, shock waves; Boltzmann-like theory of traffic flow; traffic cybernetics; simulation of traffic problems; accident statistics.

Mr. Pipes in charge

**291A. Analytical Methods of Engineering I.**

Prerequisite: Mathematics 131A and 132. Application of abstract mathematical methods to engineering problems. Linear spaces and operators. Eigenvalue problems. Spectral theory of operators. Introduction to distribution theory. Applications to problems in engineering.

Mr. Levan, Mr. Morgan in charge

**291B. Analytical Methods of Engineering II.**

Prerequisite: course 291A or consent of the instructor. Application of modern mathematical methods to engineering problems. Green's functions and eigenvalue problems for second order ordinary differential equations and their adjoints. Discrete and continuous spectra for ordinary and partial differential equations. Initial and boundary value problems.

Mr. Levan, Mr. Morgan in charge

**291C. Integral Equations in Engineering.**

Prerequisite: Mathematics 250B. Introduction to generalized function theory and Green's functions. Conversion of partial equations to integral equations and classification of integral equations. Solution to integral equations with degenerate kernels; discussions of successive approximations and Fredholm and Hilbert-Schmidt theory.

Mr. Westmann in charge

**298. Seminar in Engineering. (½ to 1 course)**

Prerequisite: graduate status in engineering; consent of the instructor. Seminars may be organized in advanced technical fields. Course may be repeated provided no duplication exists. If appropriate, field trips may be arranged.

Mr. O'Neill in charge

**299A. Introduction to Planning Theory.**

(Same as Architecture and Urban Planning 200.) Prerequisite: consent of the instructor. Types of planning and their interaction in system guidance; case studies of national, regional, and local planning; development of hypotheses for planning research; the role of the planner as an agent of change as conditioned by the cultural and institutional environment.

The Staff in charge

**299B. Introduction to Urban Theory.**

(Same as Architecture and Urban Planning 210.) Prerequisite: consent of the instructor. The changing ecological structure of the American city and consideration of the technological, economic, and social forces accounting for these changes; ecological and location theories; accelerated urbanization; large-scale urban systems.

The Staff in charge

**299C. Large-Scale Mathematical Programming.**

(Same as Business Administration 211B.) Prerequisite: knowledge of linear and nonlinear programming and consent of the instructor. Theory and computational methods for optimizing large-scale linear and nonlinear programs. Exploitation of special structures with combinatorial, dynamic, multidivisional, and stochastic aspects to obtain practical solution procedures in spite of large numbers of variables and/or constraints.

The Staff in charge

**299D. Network Flows and Combinatorial Programming.**

(Same as Business Administration 210C.) Prerequisite: consent of the instructor. Theory and techniques of discrete models in operations research. Integer programming, combinatorial programming, and network flows. Applications to various allocation, coordination, scheduling and sequencing problems.

The Staff in charge

**†470A-470D. The Engineer in the Technical Environment.**

Prerequisite: acceptance in the Engineering Executive Program. Theory and application of quantitative methods in the analysis and synthesis of engineering systems for the purpose of making management decisions. Optimization of outputs with respect to dollar costs, time, material, energy, information and manpower. Includes case studies and individual projects.

Mr. O'Neill in charge

**†471A-471B-471C. The Engineer in the General Environment. (1, ½, 1 course)**

Prerequisite: acceptance in the Engineering Executive Program. Influences of human relations, laws, social sciences, humanities and fine arts on the development and utilization of natural and human resources. The interaction of technology and society—past, present and future. Change agents and resistance to change.

Mr. Campbell in charge

**†472A-472B-472C-472D. The Engineer in the Business Environment. (1, 1, ½, 1 course)**

Prerequisite: acceptance in the Engineering Executive Program. The language of business for the engineering executive. Accounting, finance, business economics, business law, and marketing. Laboratory in organization and management problem-solving. Analysis of actual business problems of the firm, the community, and the nation, provided through cooperation and participation with California business corporations and government agencies.

Mr. Campbell, Mr. Melancon in charge

**†473A-473B. Analysis and Synthesis of a Large-Scale System.**

Prerequisite: acceptance in the Engineering Executive Program. Credit to be given only upon completion of 473B. A problem area of modern industry or

† Open only to Engineering Executive Program students. See page 135 of this bulletin.

government is selected as a class project and its solution is synthesized using quantitative tools and methods. The project also serves as a laboratory in organization for a goal oriented technical group.

Mr. Asimow in charge

#### 596. Directed Individual or Tutorial Studies.

(½ to 2 courses)

Prerequisite: graduate status in engineering; consent of the instructor. Application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. Supervised investigation of advanced technical problems. The Staff in charge

#### 596X. Directed Individual Preparation for Ph.D.

Foreign Language Examinations.

(½ to 2 courses)

Prerequisite: graduate status in engineering; consent of the instructor. Application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. Preparation for Ph.D. foreign language examination. The Staff in charge

#### 597A. Preparation for M.S. Comprehensive Examination. (½ to 2 courses)

Reading and preparation for M.S. comprehensive examination. The Staff in charge

#### 597B. Preparation for Ph.D. Preliminary

Examinations. (½ to 2 courses)

Prerequisite: graduate status in engineering; consent of the instructor. Application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. The Staff

#### 597C. Preparation for Ph.D. Oral Qualifying

Examination. (½ to 2 courses)

Prerequisite: graduate status in engineering; consent of the instructor. Application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. Preparation for Oral Qualifying Examination, including preliminary research on dissertation. The Staff

#### 598. Research for and Preparation of the Master's Thesis. (½ to 2 courses)

Supervised independent research for M.S. candidates, including thesis prospectus. The Staff in charge

#### 599. Research and Preparation of the Doctoral Dissertation. (½ to 2 courses)

Prerequisite: graduate status in engineering; consent of the instructor. Usually taken after student has been advanced to candidacy. Application forms may be obtained from the Assistant Dean, Graduate Studies. The Staff

## ENGLISH

(Department Office, 2225 Humanities Building)

Robert Martin Adams, Ph.D., *Professor of English.*

J. Donald Bowen, Ph.D., *Professor of English.*

Vinton Adams Dearing, Ph.D., *Professor of English and Computer Applications in Literature.*

Robert William Dent, Ph.D., *Professor of English.*

Hugh Gilchrist Dick, Ph.D., *Professor of English.*

Philip Calvin Durham, Ph.D., *Professor of English.*

John Jenkins Espey, B.Litt., M.A., (Oxon.), *Professor of English.*

Robert Paul Falk, Ph.D., *Professor of English.*

Leon Howard, Ph.D., L.H.D., *Professor of English.*

Paul Alfred Jorgensen, Ph.D., *Professor of English.*

Robert Starr Kinsman, Ph.D., *Professor of English.*

Richard D. Lehan, Ph.D., *Professor of English.*

William Matthews, Ph.D., Litt.D., *Professor of English.*

Earl Miner, Ph.D., *Professor of English.*

Blake Reynolds Nevius, Ph.D., *Professor of English.*

Ada Blanch Nisbet, Ph.D., *Professor of English.*

Maximillian Erwin Novak, Ph.D., D.Phil., *Professor of English (Vice-Chairman of the Department).*

James Emerson Phillips, Jr., Ph.D., *Professor of English.*

Clifford Holmes Prator, Ph.D., *Professor of English (Vice-Chairman of the Department).*

Florence Ridley, Ph.D., *Professor of English.*

William David Schaefer, Ph.D., *Professor of English (Chairman of the Department).*

Hugh Thomas Swedenberg, Jr., Ph.D., *Professor of English.*

D. K. Wilgus, Ph.D., *Professor of English and Anglo-American Folksong.*

Llewellyn Morgan Buell, Ph.D., *Emeritus Professor of English.*

- Charles V. Hartung, Ph.D., *Emeritus Professor of English.*  
 Claude Jones, Ph.D., *Emeritus Professor of English.*  
 Alfred Edwin Longueil, Ph.D., *Emeritus Professor of English.*  
 Franklin Prescott Rolfe, Ph.D., *Emeritus Professor of English.*  
 Russell Norman Campbell, Ph.D., *Associate Professor of English.*  
 Ronald E. Freeman, Ph.D., *Associate Professor of English.*  
 Gerald Jay Goldberg, Ph.D., *Associate Professor of English.*  
 George Robert Guffey, Ph.D., *Associate Professor of English.*  
 Charles Bennett Gullans, Ph.D., *Associate Professor of English.*  
 Henry Ansgar Kelly, Ph.D., *Associate Professor of English.*  
 Jascha Kessler, Ph.D., *Associate Professor of English.*  
 Richard Alan Lanham, Ph.D., *Associate Professor of English.*  
 Lois McIntosh, Ph.D., *Associate Professor of English.*  
 John Frederick Povey, Ph.D., *Associate Professor of English.*  
 Alan Henry Roper, Ph.D., *Associate Professor of English.*  
 Clyde R. Taylor, Ph.D., *Associate Professor of English in Residence.*  
 Georg Bernhard Tennyson, Ph.D., *Associate Professor of English.*  
 Peter Larsen Thorslev, Ph.D., *Associate Professor of English.*  
 Walter Eldon Anderson, Ph.D., *Assistant Professor of English.*  
 Joseph John Arpad, Ph.D., *Assistant Professor of English.*  
 H. Bradford Arthur, Ph.D., *Assistant Professor of English.*  
 Calvin Bernard Bedient, Ph.D., *Assistant Professor of English.*  
 Charles Ashton Berst, Ph.D., *Assistant Professor of English.*  
 Frederick Lorrain Burwick, Ph.D., *Assistant Professor of English (Vice-Chairman of the Department).*  
 J. Douglas Canfield, Ph.D., *Assistant Professor of English.*  
 Allan Conrad Christensen, Ph.D., *Assistant Professor of English.*  
 Edward Ignatius Condren, Ph.D., *Assistant Professor of English.*  
 Richard Keith Cross, Ph.D., *Assistant Professor of English.*  
 William Carter Edinger, Ph.D., *Assistant Professor of English.*  
 F. Douglass Fiero, Ph.D., *Assistant Professor of English.*  
 C. F. William Forsberg, Ph.D., *Assistant Professor of English.*  
 Robert A. Georges, Ph.D., *Assistant Professor of English.*  
 Christopher Waldo Grose, Ph.D., *Assistant Professor of English.*  
 Evelyn R. Hatch, Ph.D., *Assistant Professor of English.*  
 Loyce Randel Helms, Ph.D., *Assistant Professor of English.*  
 Ralph Charles LaRosa, Ph.D., *Assistant Professor of English.*  
 J. A. Leo Lemay, Ph.D., *Assistant Professor of English.*  
 Kenneth Robert Lincoln, Ph.D., *Assistant Professor of English.*  
 Robert M. Maniquis, Ph.D., *Assistant Professor of English.*  
 Kenneth Bernard Newell, Ph.D., *Assistant Professor of English.*  
 John W. Oller, Ph.D., *Assistant Professor of English.*  
 Morriss Henry Partee, Ph.D., *Assistant Professor of English.*  
 Earl James Rand, Ph.D., *Assistant Professor of English.*  
 Robert Alvin Rees, Ph.D., *Assistant Professor of English.*  
 David Stuart Rodes, Ph.D., *Assistant Professor of English.*  
 George S. Rousseau, Ph.D., *Assistant Professor of English.*  
 Alan Francis Sandy, Jr., Ph.D., *Assistant Professor of English.*  
 Paul Roland Sellin, Ph.D., *Assistant Professor of English.*  
 Paul Douglas Sheats, Ph.D., *Assistant Professor of English.*  
 Matthew Victor Skulicz, Ph.D., *Assistant Professor of English.*  
 Patrick Lee Story, Ph.D., *Assistant Professor of English.*  
 Ben Marchant Vorpahl, Ph.D., *Assistant Professor of English.*

Carey Gail Wall, Ph.D., *Assistant Professor of English.*  
 Robert D. Wilson, Ph.D., *Assistant Professor of English.*  
 Stephen Irwin Yenser, Ph.D., *Assistant Professor of English.*



Steven Latimer Bates, M.A., *Acting Assistant Professor of English.*  
 Charles Linwood Batten, Jr., M.A., *Acting Assistant Professor of English.*  
 Jerome Cushman, A.B., B.S.L.S., *Senior Lecturer in English and Library Service.*  
 Alexander Lance Hammond, M.A., *Acting Assistant Professor of English.*  
 Gordon Lee Kipling, M.A., *Acting Assistant Professor of English.*  
 Donald Glenn Marshall, M.A., *Acting Assistant Professor of English.*  
 Bernard Wolfe, B.A., *Lecturer in English.*



Barbara Hall Partee, Ph.D., *Assistant Professor of Linguistics.*  
 Peter Ladefoged, Ph.D., *Professor of Phonetics.*  
 Robert Paul Stockwell, Ph.D., *Professor of Linguistics.*

Students must have passed Subject A (either examination or course) before taking any course in English. Regulations concerning Subject A will be found on page 40 of this bulletin.

#### Preparation for the Major

English 1, 2, 10A, 10B, 10C taken in sequence, each course being a prerequisite for the next course; English 5A-5B or Humanities 1A-1B or two courses chosen from Classics 141, 142, 143.

#### The Major

English 140 (Criticism), 141 (Chaucer), 142A and 142B (Shakespeare), 143 (Milton), and a minimum of seven additional upper division English courses, with the provision that (1) at least six of the seven courses must be chosen from the 150-180 series; (2) at least three of the seven must be in courses other than in the novel or drama; (3) at least one must be in English literature prior to 1800 (the 150 series); (4) at least one must be in English literature of the nineteenth or twentieth centuries (the 160 Series); (5) at least one must be from the 170-172 series of American literature.

All majors are encouraged to elect additional courses from the 150-170 series, and to take at least one "Specialized Study" course from the 180 series.

Foreign Language Requirements: All majors graduating after the summer of 1973 must have completed the 5th course or its equivalent in any one foreign language. Students planning to do graduate work in English are urged to pursue the study of at least one foreign language beyond the level of the 5th course.

#### Major for Foreign Students

The Department offers a special major in English open optionally to bona fide foreign students whose mother tongue was a language other than English. As preparation for this major, the requirements are: English 1, 2, 10A, 10B, 10C in sequence; two one-quarter courses in either English or American history; and Speech 1. The following 13 courses are required for the major itself: English 103J; 106J; 109J; one course chosen from 111, 112, or 114; one from 115, 116, or 117; 122; 140; 142A and 142B; one from the 150 series; one from the 160 series; two electives from 141, 143, or courses numbered between 150 and 189. Students who complete this major and wish to go on to an M.A. degree in English at UCLA must first take all courses included in the regular English major that have not already been taken.

#### Teaching Credential Candidates

Students planning to obtain an elementary or secondary teaching credential should arrange their programs so as to elect English 120 and 130 in their senior year. Also strongly recommended are Speech 111 (or 112A or 112B), English 110, 111A, and 112. English 300 and additional courses as prescribed by the Graduate School of Education will be taken in the graduate year. For additional information on courses leading to the teaching credential, consult the Graduate School of Education (Moore Hall 201) and the Department of English (Humanities Building 2225).

#### Honors Seminars in English 1 and 2

Entering students with a score of 700 on the CEEB English Achievement Test and a

verbal score of 650 on the CEEB Scholastic Aptitude Test are eligible to enroll in an English 1 honors seminar. Interested students should bring their scores to the department offices before enrollment day. At the invitation of the department honors committee, students who have received a grade of A in English 1 may enroll in an English 2 honors seminar (winter and spring quarters only). A list of eligible students will be available in the department office prior to enrollment day.

### The Honors Course in English

Majors with a 3.25 overall grade-point average and a 3.4 grade-point average in English courses are encouraged to enter the senior honors program in English. This program consists of two courses from the 180 series of Specialized Study courses and one Special Study tutorial (English 199H). Students must register for the program and be interviewed by the honors chairman during the final quarter of their junior year. Departmental honors will be awarded only to students who follow this procedure in entering the program, and who achieve at graduation at least 3.25 overall and 3.6 in upper division English courses, at least 10 of which must be completed at UCLA.

### Requirements for Admission to Graduate Courses

The requirement is ordinarily the undergraduate major in English (or its equivalent) in which a superior and clearly promising record has been achieved. Prospective students are required to take the Graduate Record Examination (Advanced Test) in literature and to have their scores reported to the Department of English. A graduate student in another department who wishes to take a graduate course in English must secure the permission of the professor teaching the course.

### Requirements for the Master's Degree

1. For the general requirements, see pages 153-154. The master's degree program is directed primarily toward providing prospective junior college teachers with the knowledge and skills they will need as teachers of English. The Department follows the Comprehensive Examination Plan, as described on page 155. The comprehensive examinations for the M.A. are given three times a year.

2. *Foreign Language.* Students may fulfill the language requirement by demonstrating a reading knowledge of any foreign language. The reading test should be taken at the be-

ginning of the first quarter of residence, but in any event no later than the mid-term of the quarter in which all degree requirements are to be completed.

3. *Departmental Program.* The M.A. program has been divided into four plans suitable to the area in which the student plans to teach. Students must complete nine courses in one of the following: (a) *Literature.* 201 or 140; 220 series; 220 or 230 (selected from a period before 1800); 230 series or a seminar; 270; 272 or 275; 120; elective in English; unrestricted elective. (b) *Language.* 201 or 140; 220 series; 230 series or a seminar; 120; 121 or 122; 213; 240 or 241; 270; unrestricted elective. (c) *Creative Writing.* 140 or 201; 220 series; 220 or 230 series; 230 series or a seminar; three courses selected from English 133A-133B-133C, 134A-134B-134C, 135A-135B-135C; 270; 120. (d) *English for Minority Groups.* 201 or 140; 220 series; 230 series or a seminar; 120 or 122; 123; 272; 275; elective in literature of minority groups; unrestricted elective.

In accordance with University requirements, at least five courses must be at the graduate level, that is, in the 200 series. Four courses may be in the 100 series. Students should consult the Department concerning recommended electives suitable to each of the four plans.

4. Upon the completion of all requirements, the student will be given a comprehensive oral examination of no less than one hour designed to test his intellectual grasp of the major literary documents presented to him during his graduate study and his ability to analyze a work of literature.

(The M.A. degree may also be earned as part of the doctoral program. See Requirements for the Doctor's Degree, below.)

### Statute of Limitations for Masters Candidates

Students must conform to the following schedule in proceeding toward the M.A. degree:

1. A maximum of three and one quarter calendar years from the time of entrance to taking the oral examination.

2. A maximum of twelve courses before taking the oral examination.

### Requirements for the Doctor's Degree

1. For the general requirements, see page 156. The Ph.D. is primarily a research degree, and the Department's program is designed for students intending to teach in colleges and universities. Qualifying examinations are given twice a year.



2. *Foreign Language.* In addition to taking required courses in Old English and Middle English, students will normally be expected to have a reading knowledge of two foreign languages (e.g., French, German, Italian, Greek, or Latin). As an option to the two-language requirement, students may elect to pursue study of a single language in order to attain a superior proficiency. For details about this option and the possibility of offering a second language other than those named above, the student should consult Department advisers. One of the two languages must be satisfied prior to the second quarter of residence at UCLA, and the second language at least by the end of the seventh quarter of residence.

3. *Departmental Program, First Stage:* (a) In the first stage, which leads to the master's degree, the student must take nine English courses from the 200 series, including courses 200 and 210. Upon successful completion of these courses (and the reading test in one foreign language), the student will take Part I of the qualifying examinations. This consists of four three-hour written examinations, one of which may be taken in a genre (novel, drama, or literary criticism) and at least three of which must be taken in any of the following chronological periods: the Middle Ages, the Renaissance, the Earlier Seventeenth Century, the Restoration-Eighteenth Century, the Romantic period, the Victorian period, American Literature to 1828, American Literature: 1828-1912, and either American Literature: 1912 to the Present or Twentieth-Century British Literature. No student may write on more than two American fields, and those who elect a genre or literary criticism field may choose only one field in American literature. With the exception of courses 200 and 210, there are no specific course requirements in this first stage of the program, but students must take at least one course (220-268) in each of two chronological periods not chosen for the qualifying examination. These courses may be taken either before or after the Part I qualifying examination, but in no case later than the second quarter in residence following that examination. In lieu of taking these two courses, a student may request an oral examination in any two chronological fields not chosen for the Part I qualifying examination; this oral must be passed within six months after the Part I examination. (b) Qualified students holding a master's degree from another institution may enter the program for the doc-

tor's degree, but they are required to take and pass the Part I qualifying examination.

4. *Departmental Program, the Candidate Stage:* In the second part of the program, the candidate must take six courses from a 200 series, including English 211 and 212 and a minimum of three English seminars. The student is encouraged to take as many seminars as possible (any graduate seminar may be repeated for credit) as well as suitable courses in other departments. When through course work and independent study the student is deemed sufficiently well prepared, and after he has passed the test in a second foreign language, he takes the Part II qualifying examination. This consists of six hours of written examination and a two-hour oral. Both examinations are upon the candidate's field of specialization, which is either an acceptable medieval period, or one-hundred-year post medieval period, or an acceptable genre, theme, interdepartmental subject (e.g., English or American Folklore) or interdepartmental discipline (e.g., English linguistics).

5. *Departmental Program, the Dissertation Stage:* When a student has passed the Part II qualifying examination, he is officially advanced to candidacy and may receive the degree of Candidate in Philosophy. He thereupon proceeds with the writing of his dissertation, and his final examination for the degree is a defense of the dissertation before a University committee.

#### **Statute of Limitations for Doctoral Candidates**

Students must conform to the following schedule in proceeding toward the Ph.D.:

1. A maximum of two calendar years from time of entrance to taking the Part I qualifying examination.
2. A maximum of two calendar years between Part I and Part II qualifying examinations.
3. A maximum of three calendar years from advancement to candidacy to completion of the degree.

#### **Lower Division Courses**

##### **1. English Composition.**

Prerequisite: completion of the Subject A requirement. Principles and methods of expository writing with readings and analysis of expository prose. Class discussion, three hours; individual and group conferences, one hour. The Staff

##### **2. English Composition and Literature.**

Prerequisite: course 1. Expository writing continued, emphasizing critical reading and writing about specific works of literature in various forms. Class discussion, three hours; individual and group conferences, one hour. The Staff

**5A. Historical Backgrounds of English Literature to 1660.**

Prerequisites: course 1, 2. Historical, political, and economic backgrounds of English literature from Anglo Saxon times to the Restoration.

**5B. Historical Backgrounds of English and American Literature, 1660 to the Present.**

Prerequisite: course 5A. A continuation of the historical, political, and economic backgrounds of both English and American literature.

**10A. English Literature to 1660.**

Prerequisite: courses 1, 2. A survey of the work of major writers of the period, including Chaucer, Spenser, Bacon, Donne, and Milton. **The Staff**

**10B. English Literature, 1660-1832.**

Prerequisite: course 10A. A survey of the work of major writers of this period, including Dryden, Swift, Johnson, Wordsworth, Coleridge, Byron, Shelley, and Keats. **The Staff**

**10C. English Literature, 1832 to the Present.**

Prerequisite: course 10B. A survey of the work of such writers as Tennyson, Browning, Arnold, Carlyle, Mill, Hopkins, Yeats, Joyce, and Eliot. **The Staff**

**70. Contemporary Themes in British and American Literature.**

Prerequisite: course 1. The course will focus each quarter on one of a variety of topics of current interest. May be repeated for credit. **The Staff**

**Upper Division Courses**

Courses 1, 2, 10A-10B-10C are prerequisite to all other courses in English except 100 through 122, for which course 1 is prerequisite, and courses 130 through 135, for which courses 1 and 2 are prerequisite. Consent of the instructor is required for enrollment in courses 133 through 135.

**100. Major British Authors before 1800.**

Not open for credit to English majors or students who have had 10A or 10B. A study of selected masterpieces of English literature before 1800, including the works of such writers as Chaucer, Shakespeare, Milton, Swift, Pope, Johnson, and Fielding. **The Staff**

**101. Major British Authors, 1800 to the Present.**

Not open for credit to English majors or students who have had 10B or 10C. A study of selected masterpieces of English literature, 1800 to the present, including such writers as Wordsworth, Coleridge, Keats, Dickens, Tennyson, Browning, Arnold, Yeats, and T. S. Eliot. **The Staff**

**102. Major American Authors.**

Not open for credit to English majors or students who have had any courses in the 170 series. An introduction to the chief American men of letters, with emphasis upon the poetry, nonnarrative prose, and short fiction of such writers as Poe, Emerson, Whitman, Twain, Frost, and Hemingway. **The Staff**

**103. Shakespeare.**

Not open for credit to English majors or students who have had 142A or 142B. A survey of Shakespeare's plays, including comedies, histories, and

tragedies selected to represent Shakespeare's breadth, artistic progress, and total dramatic achievement. **The Staff**

**104. The American Novel.**

Not open for credit to English majors. The development, with emphasis on form, of the American novel from its beginning to the present day. Included are works of such novelists as Hawthorne, James, Fitzgerald, and Faulkner. **The Staff**

**110. Introduction to Poetry.**

A study of critical issues (metrics, diction, figurative language, symbolism, irony and ambiguity, form and structure) and aesthetic issues, including evaluative criteria; followed by the close critical analysis of a selection of representative poems. This course is particularly recommended for teaching credential candidates. **Mr. Anderson, Mr. Thorlev**

**111A. The Literature of Myth and Oral Tradition.**

(Same as Folklore 111.) A study of myth, dramatic origins, oral epic, folktale and ballad, emphasizing Indo-European and Semitic examples. **Mr. Arpad**

**111B. Anglo-American Folk Song.**

(Same as Folklore 106.) Prerequisite: junior standing. A survey of Anglo-American balladry and folk song, with attention to historical development, ethnic background, and Semitic examples. **Mr. Wilgus**

**111C. Introduction to British Folklore and Mythology.**

(Same as Folklore 121.) Prerequisite: junior standing. A survey of the folklore of the peoples of Britain, with attention to their history, function, and regional differences. **Mr. Georges**

**112. Children's Literature.**

A study of the historical backgrounds and development of types of children's literature, folklore and oral tradition, levels of interest, criticism and evaluation, illustration and bibliography. **Mr. Cushman**

**113A-113B. The English Bible as Literature.**

The principal literary monuments of the Old and New Testament in the King James version. **Mr. Dearing, Mr. Helms**

**114. Survey of African Literature in English.**

A survey of contemporary literature from English-speaking Africa, reviewing the major genres from several countries and making cross-comparisons with other literatures. Generalizations concerning the nature of the English used by such writers will be examined. **Mr. Povey**

**115. American Popular Literature.**

A study of the main currents of popular and cultural taste as reflected in such genres as dime novels, detective fiction, and Western stories. **Mr. Durham, Mr. Vorpahl**

**116. Recent British and American Literature.**

British and American literature since the mid-century: a survey of recent trends and developments in poetry, fiction, and criticism. **Mr. Bedient, Miss Wall**

**117. The Short Story in England and America.**

A historical survey of the short story as a genre from the eighteenth century to the present day. **Mr. Newell, Mr. Rees**

**120. English Language Study for Teachers.**

A survey of those areas of theoretical and applied English linguistics that are of special interest and importance for primary and secondary school English teachers. Subjects covered include: approaches to the description of English grammar; regional and social dialects of American English; contributions of English language study to the teaching of reading, spelling, composition and literature.

Mr. Arthur, Mrs. Hatch

**121. The History of the English Language.**

A study directed toward English majors of the main features in the grammatical, lexical and phonetic condition of the English language from Indo-European up to the present time.

Mr. Arthur, Mr. Skulicz

**122. The Structure of Modern American English.**

A general description of the English language as it is currently used in North America, and study of the developments which have led to distinctive American characteristics.

Mr. Arthur, Mr. Campbell

**123. Afro-American English.**

Prerequisite: English 120 or Linguistics 100; pre- or co-requisite: English 122 or the equivalent. A detailed study, involving the analysis of tapes and documents, of the characteristics of urban Afro-American speech and writing.

Mrs. Garcia, Mr. Smith

**130. Composition for Teachers.**

Preparation for future teachers of English composition in the writing and criticism of the kinds of prose discourse usually taught in the secondary schools.

The Staff

**131. Exposition.**

Weekly assignments designed to cover the standard patterns of expository writing: enumeration, classification, cause and effect, narrative exposition, etc.

The Staff

**133A-133B-133C. Creative Writing: Poetry.**

Weekly exercises in the writing of poetry, with practice in the standard forms and metres and the study of techniques. Classroom discussion based on student work.

Mr. Gullans, Mr. Kessler

**134A-134B-134C. Creative Writing: Short Story.**

The completion of three stories of average length during each quarter. Some of these may, with the instructor's permission and the student's wish, be a substantial revision of one of the other stories presented. Classroom discussion based on student stories.

Mr. Goldberg, Mr. Kessler

**135A-135B-135C. Creative Writing: Drama.**

An exploration of the capacity of each student to write for the theater. Class discussion of student writing, individual conferences, rehearsed readings, and laboratory productions.

Mr. Davis

**140. Criticism.**

An introduction to the types of literary criticism and their methods of analysis and evaluation.

The Staff

**141. Chaucer.**

A study of selected items from Chaucer's major works with emphasis upon *The Canterbury Tales*.

The Staff

**142A. Shakespeare: The Poems and Early Plays.**

For English majors (and non-majors who have completed 10A-10B-10C). An intensive study of selected poems and representative comedies, histories, and tragedies through *Hamlet*.

The Staff

**142B. Shakespeare: The Later Plays.**

Prerequisite: course 142A. For English majors (and non-majors who have completed 10A-10B-10C). An intensive study of representative problem plays, major tragedies, Roman plays and romances.

The Staff

**143. Milton.**

A study of the major works of Milton with emphasis on *Paradise Lost*.

The Staff

**150. Later Medieval Literature.**

Reading and historical explication of the major writers of the fourteenth and fifteenth centuries (excluding Chaucer); e.g., the Gawain-poet, Langland, Gower, Malory, miracle and morality plays, prose, and short poems. The more difficult texts will be read in modernized form.

Mr. Kelly, Mr. Kinsman

**151. Elizabethan Literature.**

A study of English literature of the sixteenth century, with special emphasis on the development and interrelationships of poetry, prose, fiction, and literary theory and criticism during the reign of Elizabeth I.

Mr. Edinger, Mr. Lanham, Mr. Sellin

**152. The Drama to 1642.**

A study of the English drama, excluding Shakespeare, from the beginning to the closing of the theaters, with special emphasis on plays of the Elizabethan and Jacobean periods.

Mr. Dent, Mr. Forsberg

**153. Literature of the Earlier Seventeenth Century (1600-1660).**

A study of the major works as literary documents and as products of seventeenth-century thought. The work of Milton is excluded.

Mr. Guffey, Mr. Gross

**154. Literature of the Restoration and Earlier Eighteenth Century (1660-1730).**

A study of major works as literary documents and as products of Restoration and earlier eighteenth-century thought.

Mr. Roper, Mr. Rousseau

**155. Literature of the Later Eighteenth Century (1730-1798).**

A study of major works as literary documents and as products of later eighteenth-century thought.

Mr. Rousseau, Mr. Story

**156. The Drama, 1660-1842.**

A survey of the English drama from the Restoration to the Licensing Act.

Mr. Rodes

**157. The Novel to 1832.**

A survey of the major English novelists from Defoe through Scott.

Mr. Anderson, Mr. Rousseau

**160. Earlier Romantic Poetry and Prose.**

An intensive study of the poetry and prose of Blake, Wordsworth, and Coleridge, with collateral readings from such authors as Godwin, Burke, Paine, Burns, Southey, Lamb, DeQuincy, and Scott.

Mr. Burwick, Mr. Helms, Mr. Sheats

**161. Later Romantic Poetry and Prose.**

An intensive study of the poetry and prose of Keats, Shelly, and Byron, with collateral readings from such authors as Hazlitt, Hunt, Landor, Clare, Moore, and Peacock. Mr. Maniquis, Mr. Story

**162. Victorian Poetry.**

A study of major and minor Victorian poets, with special emphasis on Tennyson, Browning, Arnold, and Hopkins. Mr. Christensen, Mr. Freeman

**163. Victorian Prose.**

A study of major prose writers of the Victorian period, including Carlyle, Ruskin, Arnold, Mill, Newman, Pater, and Wilde. Mr. Tennyson

**164. The Novel, 1832-1900.**

A survey of the major English novelists from Dickens through Hardy. Mr. Berst, Mr. Roper

**165. Twentieth-Century British Poetry and Prose.**

A study of the dominant trends of the twentieth century, with emphasis on experimental work in short fiction, poetry, and the contemporary critical sensibility. Mr. Espey, Mr. Kessler, Mr. Newell

**166. The Novel, 1900 to the Present.**

A survey of the major English novelists from Conrad to the present. Mr. Bedient, Mr. Cross

**167. The Drama, 1842 to the Present.**

A survey of British and American drama with its principal continental influences. For Theater Arts majors the prerequisite of courses 10A-10B-10C is waived. Mr. Berst

**170. American Literature to 1800.**

A historical survey of American literature through the Colonial and Early National Periods. Mr. LaRosa, Mr. Lemay

**171. American Literature, 1801-1865.**

A historical survey of American literature, including fiction, from the beginning of the nineteenth century to the end of the Civil War. Mr. LaRosa, Mr. Rees, Mr. Vorpahl

**172. American Literature, 1866-1912.**

A historical survey from Whitman to the founding of *Poetry* magazine. Mr. Arpad, Mr. Sandy, Mr. Vorpahl

**173. Twentieth Century American Poetry.**

The development of American poetry since 1912, including Frost, Eliot, Pound, and Stevens. Mr. Gullans, Mr. Yenser

**174. Twentieth Century American Fiction.**

The development of the American novel and short story since 1912, including Hemingway, Fitzgerald, and Faulkner. Mr. Goldberg, Miss Wall

**Specialized Studies.** These courses (180 through 189) are designed to permit a small group of students (limit: 15) to specialize in a period which they find attractive, and in which they have taken adequate upper division background courses. For the author, group or genre to be studied, see the Schedule of Classes for any given quarter. Enroll-

ments for each course are handled in the department office (Humanities Building 2225) at the time of pre-enrollment in the quarter preceding that in which the course is offered. May be repeated for credit.

**180. Specialized Studies in Medieval Literature.**

The Staff

**181. Specialized Studies in Renaissance Literature.**

The Staff

**182. Specialized Studies in Seventeenth-Century Literature.**

The Staff

**183. Specialized Studies in Eighteenth-Century Literature.**

The Staff

**184. Specialized Studies in Romantic Literature.**

The Staff

**185. Specialized Studies in Victorian Literature.**

The Staff

**186. Specialized Studies in Twentieth-Century British Literature.**

The Staff

**187. Specialized Studies in Colonial American Literature.**

The Staff

**188. Specialized Studies in Nineteenth-Century American Literature.**

The Staff

**189. Specialized Studies in Twentieth-Century American Literature.**

The Staff

**190. Literature and Society.**

Prerequisites: courses 1, 2, 10A, 10B, 10C. A record of some aspect of the relationship between literature and social, economic or political history. May be repeated for credit. The Staff

**199. Special Studies in English. (½ to 1 course)**

Open to graduate students by petition only. The Staff

**199H. Honors Tutorial.**

A tutorial course for students enrolled in the Honors Program. Each student will be expected to prepare a long paper of a critical or research nature. The Staff

**Graduate Courses****200. Approaches to Literary Research.**

The bibliographical tools of English and American literary scholarship; an introduction to descriptive bibliography, and basic methods of research. Mr. Guffey, Mr. Gullans

**201. Approaches to Literary Criticism.**

The study of the various applications, approaches, and pre-suppositions of literary criticism as it relates to the interpretation and evaluation of texts. Mr. Adams, Mr. Thorlev

**202. Enumerative and Descriptive Bibliography.**

Problems in bibliography, texts, and editions, with practical application in compiling bibliographies, editing texts, and approaching literature through textual criticism. Mr. Dearing

**203. Computer and Literary Research.**

Practice in writing and using computer programs for the analysis of literary style, content, and authorship. No previous knowledge in this area is necessary. Mr. Dearing

**210. Readings in Old English Literature.**

Mr. Condren, Mr. Matthews

**211. Readings in Middle English Literature.**

Prerequisite: course 210.

Mr. Matthews, Miss Ridley

**212. History of the English Language.**

Prerequisite: course 211.

Mr. Matthews, Mr. Skulicz

**213. The Development of Modern English.**

Prerequisite: course 122, or course 212, or Linguistics 205A. Mr. Bowen, Mr. Wilson

**Graduate Readings**

These courses, stressing wide reading in major authors, works and intellectual developments, are designed primarily for the student who has had inadequate undergraduate work in a particular field.

**220. Readings in Medievalism.**

Mr. Kelly, Miss Ridley

**221. Readings in the Renaissance.**

Mr. Dent, Mr. Dick, Mr. Phillips

**222. Readings in the Earlier Seventeenth Century.**

Mr. Guffey, Mr. Miner, Mr. Swedenberg

**223. Readings in the Restoration and Eighteenth Century.**

Mr. Dearing, Mr. Novak

**224. Readings in Romanticism.**

Mr. Burwick, Mr. Thorslev

**225. Readings in Victorianism.**

Miss Nisbet, Mr. Schaefer, Mr. Tennyson

**228A. Readings in American Literature to 1828.**

Mr. Howard, Mr. Lemay

**228B. Readings in American Literature: 1828-1912.**

Mr. Falk, Mr. Howard, Mr. Nevius

**227. Readings in American Literature: 1912 to the Present.**

Mr. Durham, Mr. Lehan, Mr. Nevius

**228. Readings in Twentieth Century British Literature.**

Mr. Adams, Mr. Espey, Mr. Kessler

**Graduate Studies**

These courses, stressing the study of a relatively few major authors or works, are pre-seminars for the student who has had either the corresponding 220 course or adequate undergraduate preparation in the field. They may be repeated for credit.

**230. Studies in Medieval Literature.****231. Studies in Renaissance Literature.****232. Studies in Earlier Seventeenth Century Literature.****233. Studies in Restoration and Eighteenth-Century Literature.****234. Studies in Romantic Literature.****235. Studies in Victorian Literature.****236. Studies in American Literature.****237. Studies in Contemporary Literature.****238A. Studies in the History of Literary Criticism to 1800.****238B. Studies in the History of Literary Criticism: 1800 to the Present.****238C. Studies in the History of Literary Criticism: Special Problems.****Graduate Seminars**

Seminars may be elected by qualified students at any stage in the Ph.D. degree, but they are normally taken at the candidate stage. They may be repeated for credit.

**240. Phonological Structures and Dialectology.**

Mr. Matthews, Mr. Stockwell

**241. Grammatical and Lexical Structure.**

Mrs. Partee

**242. Beowulf: Seminar.**

Mr. Matthews

**243. The Ballad.**

(Same as Folklore 243.)

Mr. Wilgus

**244. Old English Literature.**

Mr. Matthews

**245. Medieval English Literature.**

Mr. Matthews, Miss Ridley

**246. Chaucer and His Contemporaries.**

Mr. Matthews, Miss Ridley

**247. Early Tudor Literature.**

Mr. Kinsman, Miss Ridley

**248. Middle English Dialects.**

Mr. Matthews

**249. Shakespeare.**

Mr. Dent, Mr. Jorgensen, Mr. Phillips

**250. Spenser.**

Mr. Phillips

**251. Elizabethan and Jacobean Drama.**

Mr. Dent, Mr. Jorgensen

**252. Elizabethan Poetry.**

Mr. Dick, Mr. Lanham, Mr. Phillips

- 253. Themes in Renaissance Literature.**  
Mr. Dent, Mr. Jorgensen, Mr. Lanham
- 254. Trends in Seventeenth Century Prose.**  
Mr. Guffey, Mr. Swedenberg
- 255. Trends in Seventeenth Century Poetry.**  
Mr. Miner, Mr. Swedenberg
- 256. Trends in Drama, 1660-1790.** Mr. Novak
- 257. Dryden and His Contemporaries.**  
Mr. Dearing, Mr. Miner, Mr. Swedenberg
- 258. Pope and His Contemporaries.**  
Mr. Novak, Mr. Rousseau
- 259. Johnson and His Contemporaries.**  
Mr. Novak, Mr. Roper
- 260. The Romantic Writers.** Mr. Thorslev
- 261. Victorian Prose.** Miss Nisbet, Mr. Tennyson
- 262. Victorian Poetry.**  
Miss Nisbet, Mr. Roper, Mr. Schaefer
- 263. The Nineteenth Century Novel.**  
Miss Nisbet, Mr. Tennyson
- 264. Contemporary American Literature.**  
Mr. Durham, Mr. Nevius
- 265. Contemporary British Literature.**  
Mr. Adams, Mr. Espey
- 266. Early American Literature.**  
Mr. Howard, Mr. Lemay
- 267. Major American Writers.**  
Mr. Falk, Mr. Howard, Mr. Nevius
- 268. Trends in American Literature.**  
Mr. Falk, Mr. Howard, Mr. Lehan
- 269. Theoretical Criticism.** Mr. Adams, Mr. Lehan
- 270. Teaching of College English Composition.**  
Mr. Freeman
- 271. Studies in African Literature in English.**  
Prerequisite: English 114 or consent of the instructor. Continuation of English 114. Special problems and trends of African literature in English.  
Mr. Povey
- 272. Current Issues in the Teaching of English.**  
Prerequisite: Course 120 or Linguistics 100. The course will focus each time on one of a variety of topics of special current interest. The Staff
- 275. Teaching English to Minority Groups.**  
Pre- or co-requisite: course 120 or Linguistics 100. The special cultural, social, psychological, and methodological considerations involved in the English instruction of minority groups in American schools and college. Mr. Arthur, Mrs. Garcia
- Professional Course in Method
- 300. The Teaching of English.**  
Required of candidates for the general secondary credential with the field major in English and Speech. Mr. Freeman

## Individual Study and Research

**596. Directed Individual Study.**

Independent study, including preparation for the foreign language examination. This course may not be used to satisfy any course requirement for a degree. The Staff

**597. Preparation for the Doctoral Qualifying Examination.**

Restricted to those who have passed Part I of the qualifying examination for the doctor's degree. The Staff

**599. Research on Dissertation.**

Restricted to those who have passed Part II of the qualifying examination for the doctor's degree. The Staff

**Courses in English as a Second Language**

Courses 33A-33B-33C, 103J, 106J, and 109J are only for students whose first language was other than English. Courses 33A-33B-33C are not open to those who have received a satisfactory grade in English I at the University of California. Permission to enroll in these three courses is given on the basis of the Entrance Examination in English as a Second Language which students whose mother tongue is not English must take instead of the Subject A examination (see page 40 of this bulletin). Depending on the result of this examination, entering students are: (1) exempted from any special English requirement; (2) required to take course 33C; (3) required to take course 33B followed by course 33C; (4) required to take course 33A followed by courses 33B and 33C; or (5) required to spend a quarter studying elementary English exclusively.

**Certificate in the Teaching of English as a Second Language (or Dialect)**

To qualify for this certificate students must meet the following requirements: (1) All students, those educated in the United States, as well as those educated in other countries, must have an educational background sufficient to qualify them as teachers in their home state or country. They will normally be admitted to the University as graduate students. With the approval of the Dean of the Graduate Division and the Chairman of the Department of English, graduate admission may be granted to students solely for the purpose of pursuing the courses leading to this certificate, provided they meet general graduate admission requirements. Students who do not meet these requirements may, upon recommendation of the Chairman

of the Department of English, be admitted to limited status to pursue the course of study leading to the certificate. (2) Courses normally taken in the fall quarter are English 370K, Linguistics 100 and a nondepartmental elective (appropriate courses in education, folklore, speech, and the structure of the student's mother tongue are especially recommended). Depending on the results of the Entrance Examination in English as a Second Language, nonnative speakers of English may be required to take English 33C in lieu of this elective. Courses normally completed in the winter quarter are English 250K, English 122, and a departmental elective (English 109K, 261K, 270K, or an appropriate course in English or American literature are recommended). Courses for the spring quarter are English 380K, English 103K (native and some nonnative speakers will be allowed to substitute Linguistics 103 or Linguistics 200A for this), and English 106K. By passing a proficiency examination in English composition, students may be exempted from course 106K, in which case they may choose any program-connected elective approved by their adviser (English 109K, 114, and 272, are recommended). (3) Certificate candidates in graduate status must maintain a grade average equivalent to that required of candidates for a University-recommended standard secondary teaching credential.

#### **Special Language Requirement for Native Speakers of English**

Students whose mother tongue is English will not be held for the first two electives (nondepartmental and departmental) mentioned in the previous paragraph. Instead they must fulfill a special requirement designed to help them acquire or perfect a knowledge of the native language or dialect of the pupils to whom they expect to teach English. This can be done by taking any one of five combinations of two courses: (1) two foreign-language courses; (2) one foreign-language course plus the corresponding course in the Linguistics 220 or 225 series; (3) one foreign-language course plus English 275; (4) English 123 plus English 275; (5) English 111K plus an unrestricted elective. Those particularly interested in working with Mexican-American, Oriental American, or American Indian pupils will normally choose the third of these alternatives; those interested in Afro-Americans will choose the fourth. In case there is doubt as to which foreign language will be most appropriate, a non-European language should be selected.

The language requirement can be fulfilled only by courses taken after admission to the Certificate Program.

#### **Combination of the Certificate with an Advanced Degree**

Students specializing in the Teaching of English as a Second Language are encouraged to combine the Certificate Program with an appropriate advanced degree. The certificate work can be so planned that upon completing it (in graduate status), a student has also fulfilled a portion of the requirements for any of several M.A. degrees: in English, linguistics, education, or African studies. It is thus possible in many cases to obtain both the certificate and the M.A. in less than two academic years. Teaching English as a Second Language may also be chosen as a field of specialization by candidates for the doctorate in Linguistics or Education.

#### **Requirements for the Master's Degree**

To be admitted to the M.A. program, students must have completed the requirements for the Certificate in the Teaching of English as a Second Language with at least a 3.25 grade-point average. Provisional admission can be obtained by a petition presented upon completion of six of the nine Certificate courses. If a student has completed the Certificate requirements while in limited status and has maintained a grade-point average of 3.25, he may, upon recommendation of the Chairman of the Department of English, be simultaneously given graduate status, admitted to candidacy for the master's degree, and allowed graduate credit for the Certificate courses which are to be counted toward the M.A.: Linguistics 100, English 103K or Linguistics 103, English 122, and English 250K. Plan I as established by the Graduate Division (see page 152), the thesis plan, will be followed for the M.A. in Teaching English as a Second Language. Nine upper division and graduate-level courses, of which at least five must be in the 200 and 500 series, and a thesis are required. These include the four Certificate courses mentioned above, English 213, English 598K, and three electives. English 598K should be taken as soon as possible. The electives will be selected as a sequence of three courses related among themselves and relevant to the thesis topic. Among the recommended fields for subspecialization are: teaching English to minority groups, language policy, the teaching of literature (for

students with an English major only), the structure of the English language, the linguistics of a particular geographical area, phonetics, dialectology, psycholinguistics and language learning, and sociolinguistics. There are no special language requirements for the M.A. other than those included among the Certificate requirements.

#### Lower Division Courses

### 33A. Intermediate English as a Second Language. (2 courses)

Meets ten hours weekly. Intensive drill in pronunciation, structural patterns, vocabulary, conversation, and composition. The Staff

### 33B. Intermediate English as a Second Language.

Meets five hours weekly. Continuation of 33A. The Staff

### 33C. Intermediate English as a Second Language.

Meets five hours weekly. Continuation of 33B with emphasis on composition. The Staff

#### Upper Division Courses

### 103J. Phonetics for Foreign Students.

Prerequisite: course 33C or the equivalent. A detailed and systematic study of the sounds of American English and the way in which they are put together in connected speech, applied to the improvement of the student's own accent. Language laboratory. Mr. Hatch, Mr. Rand

### 103K. Phonetics for Teachers of English as a Second Language.

Prerequisite: consent of the instructor. Analysis of the phonological structure of contemporary English, with attention to the differences between British and American speech. Laboratory drill directed toward individual needs. Mr. Oller

### 106J. Advanced Composition for Foreign Students.

Prerequisite: course 33C or the equivalent. Exercises in writing based on literature dealing with American life and thought, with the aim of developing control of idiomatic expression.

Mr. Oller, Mr. Rand, Mr. Smith

### 106K. Advanced Composition for Teachers of English as a Second Language.

Prerequisite: consent of the instructor. Elements of English grammar as related to classroom instruction. Compositions based on the contrastive analysis of American and other cultures.

Mr. Rand, Mr. Smith

### 109J. Introduction to Literature (for Foreign Students).

Prerequisite: course 33C or the equivalent. Selections from English and American literature presented so as to make full allowance for the students' linguistic and cultural problems and to contribute to an increasing mastery of the English language.

Mr. Arthur

### 109K. The Teaching of Literature in a Second-Language Situation.

Prerequisite: consent of the instructor. Special problems involved in teaching English literature to

students whose mother tongue is a language other than English. Choice and preparation of teaching materials. Relationship of advanced reading and composition to literature.

Miss McIntosh, Mr. Povey

### 111K. Background Language for Teachers of English as a Second Language.

Fulfills the foreign-language requirement for the Certificate in the Teaching of English as a Second Language. Beginning course in a non-Indo-European language taught as a demonstration of recommended pedagogical techniques and designed to acquaint prospective language teachers with a wide variety of linguistic structures. Mr. Campbell

#### Graduate Courses

### 250K. Contrastive Analysis of English and Other Languages. Seminar.

Prerequisites: Linguistics 100, course 370K. Theory and techniques of contrasting the phonological, grammatical, and lexical structures of English with those of other languages.

Mr. Bowen in charge

### 251K. Bilingual Comparative Studies. Seminar.

Prerequisite: courses 213 and 250K. The relationship of two languages in an incipient bilingual speaker. Further study of the techniques of contrastive analysis as a means of predicting interference between linguistic systems with application to original research projects. Mr. Bowen

### 260K. Psycholinguistics and Language Teaching. Seminar.

Prerequisite: courses 370K and 103K and Linguistics 100, or consent of the instructor. An exploration of those areas of psycholinguistics covering foreign language acquisition; types and theories of bilingualism; learning theories underlying the current methods of teaching foreign languages; basic experimental designs to test existing assumptions about learning and teaching foreign languages. Mr. Oller

### 261K. Language Testing for Teachers of English as a Second Language.

Prerequisites: Linguistics 100, course 370K. Theory of testing language competence and performance. Elementary statistical concepts. Functions of a testing program. Construction of various tests.

Mr. Oller

### 270K. The Social and Educational Role of English as a Second Language. Seminar.

Prerequisite: consent of the instructor. Use of and need for English in countries such as Nigeria and the Philippines; factors affecting language policy in their school systems; applicability of research techniques of socio- and psycholinguistics to problems of language policy. Mr. Prator

#### Professional Courses in Method

### 370K. The Teaching of English as a Second Language.

Meets five hours weekly. Prerequisite: consent of the instructor. Bibliography, survey, and evaluation of methods and materials. The nature of language learning. Analysis of the differences between two languages as a basis of instruction.

Mr. Bowen, Miss McIntosh, Mr. Prator



**375K. The Teaching of Standard English as a Second Dialect.**

Prerequisite: consent of the instructor. Survey and evaluation of methods and bibliography of materials appropriate to subject. The nature of language learning, contrastive analysis, and dialect distribution and comparison.  
Mr. Arthur

**380K. Supervised Teaching: English as a Second Language or Dialect.**

Prerequisite: course 370K. Team teaching at the elementary, secondary, or adult level under the supervision of a senior staff member.

Mr. Bowen, Mrs. Hatch, Miss McIntosh

Individual Study and Research

**596K. Directed Individual Study.**

Prerequisite: graduate standing. Credit (one course) allowed only once. Independent study in an area related to English as a Second Language. The Staff

**598K. Research and Thesis for Candidates for M.A. in Teaching English as a Second Language.**

Prerequisite: advancement to candidacy for M.A. degree in Teaching English as a Second Language. Special individual study, required of all candidates for M.A. in Teaching English as a Second Language. Graded Satisfactory/Unsatisfactory. Credit (one course) allowed only once. Should be taken as soon as possible after thesis topic is chosen.

Mr. Bowen, Mr. Campbell, Mrs. Hatch

**■ FOLKLORE AND MYTHOLOGY GROUP**

(Department Office, 11-380 Bunche Hall)

Marija Gimbutas, Ph.D., *Professor of Indo-European Studies.*

Wayland D. Hand, Ph.D., *Professor of German and Folklore and Director, Center for the Study of Comparative Folklore and Mythology.*

Vladimir Markov, Ph.D., *Professor of Slavic Languages.*

Jaun Puhvel, Ph.D., *Professor of Indo-European Studies.*

Stanley L. Robe, Ph.D., *Professor of Spanish.*

Charles Speroni, Ph.D., *Professor of Italian.*

D. K. Wilgus, Ph.D., *Professor of English and Anglo-American Folksong, and Chairman, Folklore and Mythology Group.*

Julio Rodrigues-Puértolas, Ph.D., *Associate Professor of Spanish.*

Shirley L. Arora, Ph.D., *Assistant Professor of Spanish.*

Joseph J. Arpad, Ph.D., *Assistant Professor of English.*

Robert A. Georges, Ph.D., *Assistant Professor of English and Folklore.*

Walter R. Goldschmidt, Ph.D., *Professor of Anthropology.*

James Porter, M.A., *Assistant Professor of Music and Folklore.*

———, *Assistant Professor of Indo-European Studies (Celtic).*



Marianna D. Birnbaum, Ph.D., *Lecturer in Finno-Ugric Studies.*

Paulo D. Carvalho-Neto, M.A., *Lecturer in Portuguese.*

Inkeri Rank, M.A., M.Ed., B.L.S., *Lecturer in Finno-Ugric Studies.*

Willie Ruff, M.M., *Lecturer in Music.*



Alexander Badawy, Ph.D., *Associate Professor of Art.*

Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*

Helen Florence Caldwell, M.A., *Senior Lecturer in Classics.*

John A. Crow, Ph.D., *Professor of Spanish.*

Jerome Cushman, Ph.D., *Senior Lecturer in English and Library Service.*

Elsie Dunin, M.A., *Lecturer in Dance.*

Robert B. Edgerton, Ph.D., *Associate Professor of Anthropology and Psychiatry in Residence.*

Howard Elinson, Ph.D., *Assistant Professor of Sociology.*

David G. Epstein, Ph.D., *Acting Assistant Professor of Anthropology.*

Samuel Farber, M.A., *Acting Assistant Professor of Sociology.*

Michael Owen Jones, Ph.D., *Assistant Professor of History and Folklore.*

Alma Hawkins, Ph.D., *Professor of Dance.*

Melvyn Helstien, Ph.D., *Associate Professor of Theater Arts.*

- Hazel Chung Hood, B.A., *Lecturer in Dance.*  
 Mantle Hood, Ph.D., *Professor of Music.*  
 Alexander V. Isačenko, Ph.D., *Professor of Slavic Languages.*  
 Boris A. Kremenliev, Ph.D., *Professor of Music.*  
 Daniel P. Kunene, Ph.D., *Assistant Professor of African Languages.*  
 Hilda Kuper, Ph.D., *Professor of Sociology.*  
 Leo J. Kuper, Ph.D., *Professor of Sociology.*  
 Milan S. La Du, Ph.D., *Professor of French.*  
 Juana de Laban, Ph.D., *Associate Professor of Dance.*  
 Steven Lattimore, Ph.D., *Assistant Professor of Classical Archaeology.*  
 Wolf Leslau, Ph.D., *Professor of Hebrew and Semitic Linguistics.*  
 William A. Lessa, Ph.D., *Professor of Anthropology.*  
 William Matthews, Ph.D., *Professor of English.*  
 Josefina M. Mendez, Ed.D., *Lecturer in Spanish.*  
 Michael Moerman, Ph.D., *Associate Professor of Anthropology.*  
 David Morton, Ph.D., *Assistant Professor of Music.*  
 Phillip Newman, Ph.D., *Associate Professor of Anthropology.*  
 Wendell H. Oswalt, Ph.D., *Associate Professor of Anthropology.*  
 Florence H. Ridley, Ph.D., *Professor of English.*  
 William B. Rodgers, Ph.D., *Assistant Professor of Anthropology.*  
 Arnold Rubin, Ph.D., *Assistant Professor of Art.*  
 Georges Sabagh, Ph.D., *Professor of Sociology.*  
 Stephen P. Schwartz, Ph.D., *Assistant Professor of German.*  
 Gregory M. Sifakis, Ph.D., *Associate Professor of Classics.*  
 Charles Seeger, A.B., *Research Musicologist in Music (Ethnomusicology and Folk Music).*  
 Allegra Snyder, M.A., *Lecturer in Dance.*  
 Eli Sobel, Ph.D., *Professor of German.*  
 Paul O. W. Tanner, M.A., *Lecturer in Music.*  
 Erik Wahlgren, Ph.D., *Professor of Scandinavian Languages.*  
 Donald J. Ward, Ph.D., *Associate Professor of German.*  
 Lora S. Weinroth, Ph.D., *Assistant Professor of French.*  
 Johannes Wilbert, Ph.D., *Professor of Anthropology.*  
 Dean S. Worth, Ph.D., *Professor of Slavic Languages.*  
 Jules Zentner, Ph.D., *Assistant Professor of Scandinavian Languages.*  
 ———, *Visiting Assistant Professor of Finno-Ugric Studies.*

Although no undergraduate major in folklore is offered, a wide variety of course work is available in the three following general areas: (1) languages and literatures (English and foreign languages); (2) social sciences (anthropology, sociology); (3) folk arts (art, dance, music, theater arts). Students with undergraduate preparation in folklore may continue their work on the graduate level. For planning course work, students should consult departmental advisers and the Chairman of the Folklore and Mythology Group.

#### **M.A. in Folklore and Mythology.**

The program leading to the degree of Master of Arts in Folklore and Mythology is administered by the inter-departmental Com-

mittee on Folklore and Mythology. It is open to students desiring a knowledge of the materials of folklore and mythology and the theoretical bases and techniques of research. Students completing the degree may continue folklore study in conjunction with a program leading to a degree in an allied field.

*Admission to the Program.* In addition to meeting the requirements of the Graduate Division, the students should have (1) an A.B. degree preferably in a field of the humanities or social sciences and (2) Folklore 101 and 105 or their equivalents. Upon admission to graduate status the student should consult the Chairman of the Folklore and Mythology Group.

**Requirements for the Master's Degree.**

**General Requirements.** As throughout the Graduate Division; see pages 152-153.

**Language Requirements.** A reading knowledge of a foreign language (French or German unless another language is approved by the Chairman).

**Program.** All candidates, whether electing the Thesis Plan or the Comprehensive Examination Plan, must complete the following: Folklore 200, 201A-201B, 216; Classics 161 or Indo-European Studies 140; and at least one course chosen from each of the following groups:

Group 1. Folklore 106, 142, 144, 154A-154B, 181; Music 140A-140B-140C, 142, 143A-143B, 145, 146, 147, 190A-190B.

Group 2. Folklore 120, 121, 122, 123A-123B, 124, 125, 126, 128, 129, 141, 149, 150, 221, 230A-230B, 241, 249; African Languages 150A-150B; French 115A-115B-115C, 215A-215B-215C-215D-215E; German 134, 240A-240B-240C, 245A-245B; Scandinavian 141, 245.

Group 3. Folklore 213, 217, 243, 251, 258, 259, 286; English 220; Indo-European Studies 260A-260B; Music 255, 280; Russian 291; Spanish 262A-262B.

Also required is a written examination requiring comprehensive knowledge of (1) the theoretical bases, major documents, and techniques of folklore study; (2) the major forms of folklore; and (3) either mythology, a single form of folklore or the folklore and mythology of a selected society or culture area.

**Thesis Plan.** An acceptable thesis written under the direction of a member of the Folklore and Mythology Group and an oral examination in the field of the thesis; a minimum of nine courses (including course 598) chosen from courses in the Folklore and Mythology Group, at least five of which must be in the 200 series.

**Comprehensive Examination Plan.** A minimum of nine courses chosen from the courses in the Folklore and Mythology Group, at least five of which must be in the 200 series; an oral examination covering the field of the written examination.

Through its member departments the Folklore and Mythology Group also offers a variety of course work leading to the M.A. and Ph.D. degrees. Financial aid and research opportunities are available to qualified graduate students in the form of fellow-

ships, research assistantships, teaching assistantships, and collecting stipendia. For further information, students should consult the Director of the Center for the Study of Comparative Folklore and Mythology, Mr. Hand.

**Upper Division Courses****101. Introduction to Folklore.**

Prerequisite: junior standing. A survey of the various forms of folklore and an examination of their historical and social significance. **The Staff**

**105. Folklore in American Society.**

(Same as History 105.) Prerequisite: junior standing. A cultural-historical survey of the role of folklore in the development of American civilization and of the influence of the American experience in the shaping of folklore in American society. **Mr. Georges, Mr. Jones**

**106. Anglo-American Folk Song.**

(Same as English 111B.) Prerequisite: junior standing. A survey of Anglo-American balladry and folk song, with attention to historical development, ethnic background, and poetic and musical values. **Mr. Wilgus**

**111. The Literature of Myth and Oral Tradition.**

(Same as English 111A.) A study of myth, dramatic origins, oral epic, folktale, and ballad, emphasizing Indo-European and Semitic examples. **Mr. Arpad, Mr. Wilgus**

**118. Folk Art and Technology.**

Prerequisite: junior standing. A general course concerned with the material manifestations of folk culture and the theoretical concepts and methodologies utilized in their analysis. **Mr. Jones**

**120. Historical Survey of the Gypsies.**

Prerequisite: junior standing. Study of the history, ethnic origins, and linguistics of the Gypsies.

**121. Introduction to British Folklore and Mythology.**

(Same as English 111C.) Prerequisite: junior standing. A survey of the folklore of the people of Britain, with attention to their history, function, and regional differences. **Mr. Georges, Mr. Porter**

**122. Introduction to Celtic Folklore and Mythology.**

(Same as Indo-European Studies 189.) A general course for the student in folklore, with emphasis on the types of folklore research currently practiced in Eire and the mythic traditions of the Irish and Welsh.

**123A-123B. Introduction to Finnish Folklore and Mythology.**

(Same as Finno-Ugric Studies 139A-139B.) The methods and results of Finnish folklore studies and the mythic traditions of the Finns. In 123A special attention is paid to the oral epic and the Kalevala, in 123B to lyric folk poetry, ballads, folktales, and legends. **Mrs. Rank**

**124. Finnish Folk Art and Technology.**

(Same as Finno-Ugric Studies 135.) Material manifestations of Finnish folk culture: village layout and architecture, folk technology, arts and crafts, textiles, costume and design. **Mrs. Rank**

**125. Folklore and Mythology of the Finnic Peoples.**

(Same as Finno-Ugric Studies 169.) A survey of the traditions of the smaller Finnic nationalities (Estonians, Lapps, Nordvins, Cheremis). Mrs. Rank

**126. Introduction to Baltic and Slavic Folklore and Mythology.**

(Same as Indo-European Studies 179.) A general course for students interested in folklore and mythology and for those interested in Indo-European mythic antiquities. Mrs. Gimbutas

**128. Introduction to Hungarian Folklore and Mythology.**

(Same as Finno-Ugric Studies 159.) A general course for the student in folklore and mythology, with emphasis on types of folklore and varieties of folklore research. Mrs. Birnbaum

**129. Folklore and Mythology of the Ugric Peoples.**

(Same as Finno-Ugric Studies 179.) Survey of the traditions of the smaller Ugric nationalities (Voguls, Ostyaks). Mrs. Birnbaum

**141. Oral Art and Drama of Non-Western Peoples.**

(Same as Anthropology 141.) Various genres of oral art found among non-Western peoples including myth, legend, proverb, riddle, song text and ritual drama; social function of oral art; role of the innovator; dynamics of stability and change in oral art; various classical theories of folklore.

**142. Musical Arts of Non-Western Peoples.**

(Same as Anthropology 142.) Music as an aspect of culture in various non-Western societies. Native ideas about music and systems of criticism. The social functions of music. Music in relation to anthropological theories of symbolic behavior, enculturation, innovation, unconscious patterning, and culture history.

**144. American Folk and Popular Music.**

(Same as Music 144.) A survey of the history and characteristics of the music developed in or for general American culture and various subcultures. Mr. Wilgus

**148. The Theory of Oral Literature.**

(Same as Anthropology 144.) The historical development of the study of oral literature among pre-literate people; theoretical bases for the analysis of oral traditions.

**149. Folk Literature of the Hispanic World.**

(Same as Spanish 149.) A study of the history and present dissemination of the principal forms of folk literature throughout the Hispanic countries. Mr. Carvalho-Neto, Mrs. Arora, Mr. Robe

**150. Russian Folk Literature.**

(Same as Russian 150.) Prerequisite: Russian 16. Mr. Markov

**154A-154B. The Afro-American Musical Heritage.**

(Same as Music 154A-154B.) A study of Afro-American rhythm, dance, music, field hollers, work songs, spirituals, blues, and jazz; the contrast between West Africa, Afro-American and Afro-Barzilian musical traditions. Mr. Ruff

**161. Decorative Textiles in Folk Cultures.**

Studies in ethnic origins and historical background of Eastern and Western cultures; illustrated by fabrics and costumes from the traditions.

**180. Transcription, Analysis and Classification of Folk Music.**

(Same as Music 180.) Prerequisite: course 144 or Music 140. An intensive study of methods and techniques necessary to the understanding of folk music. Mr. Porter

**181. Folk Music of Central and Western Europe.**

(Same as Music 181.) Prerequisite: Music 2A or Music 13A or consent of the instructor. An illustrated examination of the musical styles indigenous to the area between Ireland and Czechoslovakia; particular attention will be paid to the psychological function of folk music in its social and political context. Mr. Porter

**199. Special Studies in Folklore. (½ to 1 course)**

Prerequisite: senior standing and the consent of the instructor. The Staff

**Graduate Courses****200. Folklore Bibliography, Theory and Research Methods.**

Prerequisites: course 101 and one other folklore course in the 100 series. Mr. Georges, Mr. Hand

**201A-201B. Folklore Collecting and Field Research. (½ course each)**

Prerequisite: course 200. One quarter of discussion-demonstration concerning the theoretical concepts, methods, and techniques of data gathering and field research in folklore, followed by one quarter of supervised fieldwork. Mr. Jones, Mr. Wilgus

**202A-202B. Folklore Archiving. (½ course each)**

Prerequisite: course 200. One quarter of lecture-demonstration in the principles and techniques of the classification and preservation of folklore collectanea, followed by one quarter of directed experience in archiving.

**213. Folk Belief and Custom.**

Prerequisites: course 101 and any one of the following courses: 105, 118, 121, 122, 123A-123B, 124, 125, 126, 128, 149, 150; Anthropology 102, 140; German 134, 240. Mr. Hand

**216. The Folktale.**

Prerequisite: course 200 or consent of the instructor. Mr. Georges, Mr. Hand

**217. Folk Speech.**

Prerequisites: course 101 and 105, 106, or 111; also recommended: Anthropology 146A, 146B, English 121, or Linguistics 100. A study of the ethnography of communication and its relevance to the study of social and regional dialects, proverbs, riddles, onomastics, folk poetry and verse, and traditional humor. Mr. Georges

**221. Gypsy Folklore.**

A survey of Gypsy folklore with attention to the special role of the Romany people as transmitters of folklore over wide geographical continua.

**230A-230B. Folk Tradition in Italian Literature.**

(Same as Italian 230A-230B.) Mr. Speroni

**241. Folklore and Mythology of the Near East.**

(Same as Near Eastern Languages 241.)

**243. The Ballad.**

(Same as English 243.) Mr. Wilgus

**248. Theory and Method in Latin American Folklore Studies.**

A historical survey of folklore scholarship in Latin America, with emphasis on the theoretical bases and methods and techniques employed in the study of and analysis of traditional tales, songs, music, linguistic expression. Mr. Carvalho-Neto

**249. Hispanic Folk Literature.**

(Same as Spanish 249.) Mr. Carvalho-Neto, Mr. Robe

**251. Seminar in Finno-Ugric Folklore and Mythology.**

(Same as Finno-Ugric Studies 251.)

**258. Seminar in Anglo-American Folk Music.**

(Same as Music 258.) Mr. Porter, Mr. Wilgus

**259. Seminar in Folklore.**

Prerequisite: Folklore 200 and consent of the instructor. The Staff

**286A-286B-286C. Studies in Hispanic Folk Literature.**

286A. Studies in Hispanic Folk Literature—The Romancero.

(Same as Spanish 286A.) Mr. Rodriguez-Puertolas

286B. Studies in Hispanic Folk Literature—Narrative and Drama.

(Same as Spanish 286B.) Mrs. Arora, Mr. Robe

286C. Studies in Hispanic Folk Literature—Ballad, Poetry, and Speech.

(Same as Spanish 286C.) Mr. Robe

Individual Study and Research

**596. Directed Studies in Folklore. (½ to 1½ courses)**

The Staff

**597. Preparation for Comprehensive Examinations. (½ to 1½ courses)**

This course may not be used in fulfillment of minimum course requirements for the M.A. degree. The Staff

**598. Thesis Preparation. (½ to 1 course)**

The Staff

Related Courses in Other Departments

Upper Division Courses

**African Languages 150A-150B. African Literature in English Translation.****Anthropology 102. World Ethnography.**

140. Comparative Religion.

143. Primitive Art.

162. Afro-American Culture.

**Art 104A. Art of the Ancient Near East.**

118A. The Arts of Oceania.

118B. The Arts of Pre-Columbian America.

118C. The Arts of Sub-Saharan Africa.

119A. The Arts of Africa: Western Sudan.

119B. The Arts of Africa: The Guinea Coast.

119C. The Arts of Africa: The Congo.

**Classics 161. Introduction to Classical Mythology.**

162. Classical Myth in Literature.

166A. Greek Religion.

166B. Roman Religion.

**Dance 140A-140B-140C. Dance Cultures of the World.**

141. Dance of Africa.

142. Dance in the Balkans.

143. Dance in India.

144. Dance in Indonesia.

145. Dance in Japan.

146. Dance in Latin America.

147. Dance in Indian Cultures of Americas.

151A. History of Dance.

**English 112. Children's Literature.****French 115A-115B-115C. Old French Language and Medieval Literature.****German 134. German Folklore.****Indo-European Studies 140. Introduction to Indo-European Mythology.****Music 132A-132B. Development of Jazz.**

140A-140B-140C. Musical Cultures of the World.

141A-141B. Music of Indonesia.

142. Music of the Balkans.

143A-143B. Music of Africa.

145. History and Theory of Persian Music.

146. Music of Thailand.

147. Music of China.

190A-190B. Proseminar in Ethnomusicology.

**Scandinavian 141. Medieval Scandinavian Literature.****Slavic 99A-99B. Slavic Peoples and Cultures.****Sociology 124. Ethnic and Status Groups.**

130. Social Processes in Africa.

131. Latin American Societies.

132. Population and Society in the Middle East.

133. Comparative Sociology of the Middle East.

**Spanish 151. Folk Song in Spain and Spanish America.****Theater Arts 117A-117B-117C. The Puppet Theater.**

## Graduate Courses

- Anthropology** 202. Ethnography.  
203. Cultures of Asia.  
204. Pacific Island Cultures.  
205. North American Indians.  
207. Indians of South America.  
208. African Cultures.  
209. Cultures of the Soviet Union.  
252. Ethnography.  
253. Cultures of Asia.  
254. Cultures of the Pacific Islands.  
255. North American Indians.  
256. Arctic Cultures.  
257. Indians of South America.  
258. African Cultures.  
259. Cultures of the Soviet Union.  
261. Myth and Ritual.  
269. African Arts.  
270A-270B-270C. Documentary Film.
- Art** 220. The Arts of Africa, Oceania and Pre-Columbian America.
- Dance** 226. Dance Expressions in Selected Cultures.

**English** 220. Medievalism.

**French** 215A-215E. The Medieval Language and Literature.

**German** 240A. Theories, Methods and History of Germanic Folklore.  
240B. Folksong and Ballad.  
240C. Oral Prose Genres.  
245A. Germanic Religions and Mythology.  
245B. Germanic Antiquities.

**Indo-European Studies** 260A-260B. Seminar in Indo-European Mythology.

**Music** 253. Seminar in Notation and Transcription in Ethnomusicology.  
254. Seminar in Field and Laboratory Methods in Ethnomusicology.  
255. Seminar in Musical Instruments of the Non-Western World.  
280. Seminar in Ethnomusicology.

**Russian** 251A-251B. Old Russian Literature.  
291. Seminar in Old Russian Literature.

**Spanish** 262B. Epic Poetry.

## ■ FOREIGN LITERATURE IN TRANSLATION

The following courses offered in the departments of language and literature do not require a reading knowledge of any foreign language:

- African Languages** 150A-150B. African Literature in English Translation.
- Ancient Near Eastern** 150A-150B. Survey of Ancient Near Eastern Literatures in English.
- Arabic** 150A-150B. Survey of Arabic Literature in English.
- Armenian** 150A-150B. Survey of Armenian Literature in English.
- Classics** 141. Survey of Greek Literature in English.  
142. Ancient Drama.  
143. Survey of Latin Literature in English.  
144. Survey of Medieval Latin Literature in English.
- Czech** 155A-155B. Survey of Czech Literature.
- Dutch-Flemish and Afrikaans** 112. Dutch, Flemish, Afrikaans Literature in Translation.
- Finno-Ugric** 138A-138B. Survey of Finnish Literature in Translation.  
158A-158B. Survey of Hungarian Literature in Translation.

**French** 145A-145B-145C. Masterpieces of French Literature.

- 145A. The Middle Ages and Renaissance.  
145B. The 17th and 18th Centuries.  
145C. The 19th and 20th Centuries.  
146. The Novel of the 19th Century.  
147. The Novel of the 20th Century.

**German** 121A. Older German Literature in Translation.

- 121B. Classical German Literature in Translation.  
121C. 19th Century German Literature in Translation.  
121D. Modern German Literature in Translation.

**Hebrew** 150A-150B. Survey of Hebrew Literature in English.

**Humanities** 1A-1B. World Literature.

**Indo-European Studies** 168. Survey of Sanskrit Literature in Translation.

178. Survey of Lithuanian Literature in Translation.  
188. Survey of Irish Literature.

**Italian** 100A-100B-100C. Italian Literature in Translation.

- 110A-110B-110C. The Divine Comedy in English.  
140. Readings in the Italian Theater in

Translation.

150. Modern Italian Fiction in Translation.

**Oriental Languages** 140A–140B. Chinese Literature in Translation.

141A–141B. Japanese Literature in Translation.

**Persian** 150A–150B. Survey of Persian Literature in English.

**Polish** 152A–152B. Survey of Polish Literature.

**Russian** 120A–120B. Survey of Russian Literature.

124A–124F. Monographic Studies in Russian Literature.

**Scandinavian** 141. Medieval Scandinavian Literature.

142. Scandinavian Literature of the 18th and 19th Centuries.

143. Modern Scandinavian Literature.

144. Ibsen.

145. Strindberg.

**Serbocroatian** 154A–154B. Survey of Yugoslav Literature.

**Spanish** 160A–160B. Hispanic Literatures in Translation.

162. Cervantes in Translation.

## ■ FRENCH

(Department Office, 160 Haines Hall)

Marc Bensimon, Ph.D., *Professor of French*.

Francis J. Crowley, Ph.D., *Professor of French*.

Milan S. La Du, Ph.D., *Professor of French (Chairman of the Department)*.

Hassan el Nouty, Docteur-ès-Lettres, *Professor of French*.

Oreste F. Pucciani, Ph.D., *Professor of French*.

Gabriel Bonno, Docteur-ès-Lettres, *Emeritus Professor of French*.

Clinton C. Humiston, Ph.D., *Emeritus Professor of French*.

L. Gardner Miller, Docteur de l'Université de Strasbourg, *Emeritus Professor of French*.

Eric Gans, Ph.D., *Assistant Professor of French*.

Jeanne Perkins, Ph.D., *Assistant Professor of French*.

Lora Weinroth, Ph.D., *Assistant Professor of French*.

Stephen D. Werner, Ph.D., *Assistant Professor of French*.

Marius Ignace Biencourt, Docteur de l'Université de Paris, *Assistant Professor of French, Emeritus*.

———, *Assistant Professor of French*.

———, *Assistant Professor of French*.

———, *Assistant Professor of French*.

———, *Assistant Professor of French*.

———, *Assistant Professor of French*.

———, *Assistant Professor of French*.



Nicole Atlas, B.Sc., *Acting Assistant Professor of French*.

Marie-Claire Basché, M.A., *Lecturer in French*.

Colette Brichant, Docteur de l'Université de Paris, *Lecturer in French*.

David Florian, M.A., *Associate in French*.

Linda Freilich, M.A., *Associate in French*.

Jacqueline Hamel, Licenciée-ès-Lettres, *Lecturer in French*.

Dominique Isner, Certificat de Philologie, *Associate in French*.

Madeleine Korol, Ph.D., *Lecturer in French*.

Padoue de Martini, B.A., *Lecturer in French*.

Barbara Royce, M.A., *Associate in French*.

Ruth Serfaty, Licenciée-ès-Lettres, *Associate in French*.

Sylvia Walker, M.A., *Lecturer in French*.

### Preparation for the Major

Required: French 1, 2, 3, 4, 5, 6 (or 7), or their equivalents. Students receiving less than a grade of B in French 6 will take French 7 before proceeding with upper division work.

### The Major

Two majors are offered by the Department.

**Plan A:** Leading to the Bachelor of Arts in French and subsequently to the master's degree, Plan A, or to the standard secondary credential. Required: 15 full courses of upper division French including ordinarily (a) 101A-101B-101C, 102A-102B, 103A-103B-103C, 114A-114B-114C, 132A-132B; (b) and six courses covering two periods of literary history to be selected after consultation with the major adviser. Suggested: three courses in Latin, Italian, Spanish or German.

**Plan B:** With emphasis on literature, leading to the Bachelor of Arts in French and subsequently to the master's degree, Plan B. Required: 15 full courses of upper division French including ordinarily (a) 101A-101B-101C, 102A-102B, 103A-103B-103C, 114A-114B-114C; (b) and eight courses in French literature selected from the list of upper division offerings in French literature. Of these courses, six must be chosen in two out of six periods. The two remaining courses may be chosen as free electives in any field of French literature. Suggested: Three courses in Latin, Italian, Spanish or German.

Students whose knowledge of French exceeds the preparation usually received in courses preparing for the major and who demonstrate the requisite attainment in French 101ABC and/or French 103AB (please see descriptions of these courses below) will substitute for those courses in grammar and composition an equivalent number of upper division units—not necessarily in the French Department—upon consultation with their major adviser. All major students must, however, complete a minimum of 36 units in appropriate upper division French courses for a major.

Students who fail to maintain a C average or better in all work undertaken in upper division courses in the Department of French will, upon approval of the Dean of the College of Letters and Science, be excluded from the major in French.

Students intending to major in French must consult the appropriate major adviser before registering for French courses in the upper division.

Major Advisers: Mrs. Weinroth and staff.

### The Honors Programs in French

Majors with a 3.0 grade-point average and a 3.0 overall average will be eligible to apply for the Honors Program in French. Students will be informed of their eligibility near the end of their junior year and should make application at that time if they wish to enter the program. Applications should include: (1) a letter in French describing the student's field of interest in French literature and culture; (2) the student's final examination in French 101A or 114A or a term paper from another French course. If these materials meet with the Committee's approval, the student will be called for an interview. Students admitted to the program will enroll in French 140A-140B-140C. In 140A and 140B the student will devote his time to the study of some special aspect of French literature and will select a topic for his senior essay. The third quarter (140C) will be devoted to the writing of the essay under the tutorial guidance of the instructor. No regular class meetings will be scheduled for the Honors Course except the first meeting.

### Requirements for the Standard Elementary and for the Standard Secondary Teaching Credential

Consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION. At the discretion of the Department an examination will be given preparatory to recommendation for the certificate of completion for the Standard Elementary, or the Standard Secondary Teaching Credential: Should the Department direct that these examinations be given, they will be held on the first Thursday after January 1 and the third Thursday in May. They must be passed before the Department will recommend that the student take his practice teaching.

### Requirements for the Master's Degree

The Department offers two alternative programs: Plan A designed for teachers of French at the secondary and junior college levels, and Plan B leading to the Ph.D. in French.

*Department requirements.* (1) Language: For all candidates for the M.A. in French, the foreign language requirement will be fulfilled by passing a course of at least level 3 in either German, Spanish, Italian or Latin or by passing the University reading examination in one of these languages. In special cases, substitution of another foreign language will be accepted, if approved by the



Chairman of the Department. Students are required to pass the reading requirement in one of the foreign languages before taking the M.A. examination. All candidates for the M.A. must satisfy the Department as to their proficiency in spoken French. (2) **Course requirements:** Plan A: At least 12 courses in French including the following courses: 201A-201B, 202, 370-495. In addition the student will take seven courses in literature in three out of five fields (16th-20th centuries). To meet general University requirements, at least six courses must be of graduate level. The comprehensive examination will consist of a written examination in the three fields prepared, a *sight translation* from English to French (from French to English in the case of students whose native language is French), a literary composition in French (in the modern field only) of not less than two hours, an *explication de textes* and an oral examination in French covering a topic previously prepared by the candidate. At the discretion of the Department a candidate may be permitted to take this examination a second time, but under no circumstances is a third trial allowed. Plan B: At least 12 courses in French including the following courses: 201A-201B, 202. In addition the student will take nine courses in literature in three out of six fields defined as follows: Middle Ages, Renaissance and Baroque, Classicism, 18th century, 19th century, 20th century. For students specializing in French-African literature, the 20th century and French-African literature will constitute a single field. (To meet general University requirements, at least six courses must be on the graduate level.)

The comprehensive examination for Plan B will consist of a written examination in three out of six fields (medieval-twentieth century), each two hours long, an *explication de texte*, and an oral examination on three fields. Passing this examination will be equivalent to passing Part I of the qualifying examination. At the discretion of the Department a candidate may be permitted to take this examination a second time; but under no circumstances is a third trial allowed.

#### Requirements for the Ph.D.

**Departmental requirements.** (1) Language requirements: Students normally will pass this requirement by passing courses through at least level 5 in German, level 3 in Latin and either Spanish or Italian. Students may also pass a reading examination in German, Latin and either Italian or Span-

ish. In special cases, substitution of another foreign language will be accepted, if approved by the Chairman of the Department. Information concerning alternative procedures may be obtained from the Department of French. At least one of these language requirements must be satisfied prior to taking the qualifying examination, Part I. The remaining language requirements must be met prior to taking Part II of the Qualifying Examination. All candidates for the Ph.D. must satisfy the Department as to their proficiency in spoken French. (2) Required: French 201A-201B, 202, 203A-203B, 205A-205B-205C (unless previously completed). In addition the student will take such required courses as his guidance committee will prescribe in preparation for the qualifying examination, Part II. These courses shall include at least four seminars, two of which must be in the candidate's chosen area. In the case of students who already have the *Licence-ès-Lettres* or the M.A., the work taken will be evaluated by the Department and appropriate credit given toward the course and examination requirements. All students will, however, take Part I of the qualifying examination, which in this case will serve as a guidance examination for the use of the Department. (3) Part I of the qualifying examination will consist of a written examination in 3 out of 6 fields (medieval-twentieth century), each two hours long, an *explication de texte*, and an oral examination. If the student does well on these examinations, he will be encouraged to proceed further with graduate study toward the Ph.D. in either French or Romance Languages. The passing grade for Part I is an average grade of B (3.0). (4) After completion of the language requirements and the required courses, the student will take Part II of the written and oral qualifying examinations and, if successful, will be advanced to candidacy. Part II will consist of: (a) four written examinations: a five-hour examination in the candidate's chosen area to consist of a three-hour essay question and a two-hour question on literary history; three four-hour examinations in the other areas, each consisting of a two-hour essay question and a two-hour question on literary history. For the purpose of this examination, the four areas will be defined as follows: I. Medieval; II. Renaissance and Baroque; III. Classicism and the Enlightenment; IV. Modern (Two options: French literature; Franco-African literature). (b) An oral examination of two hours' duration bearing on the four areas. The passing grade for Part II is an average grade

of B (3.0). (5) After completion of the dissertation, the candidate will take an oral examination in its defense. The thesis subject and outline should be approved by the student's doctoral committee no later than October 1 of the year in which it is to be submitted. (6) If seven years have elapsed since any of the requirements have been taken, these requirements must be revalidated by the Department. Inquire at departmental office for further clarification.

#### Lower Division Courses

The ordinary prerequisites for each of the lower division courses are listed under the description of these courses. Students who have had special advantages in preparation may, upon examination or by recommendation of the instructor, be permitted a more advanced program. No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

#### 1. Elementary French.

Sections meet five hours weekly.  
Miss Hamel in charge

#### 1G. Elementary French for Graduate Students. (No credit)

Sections meet three hours weekly.  
Mrs. Brichant in charge

#### 2. Elementary French.

Sections meet five hours weekly. Prerequisite: course 1 or advanced placement standing.  
Miss Hamel in charge

#### 2G. Elementary French for Graduate Students. (No credit)

Sections meet three hours weekly. Prerequisite: course 1G or the equivalent. Mrs. Brichant in charge

#### 3. Elementary French.

Sections meet five hours weekly. Prerequisite: course 2 or two years of high school French or advanced placement standing. Miss Hamel in charge

#### 4. Intermediate French.

Sections meet five hours weekly. Prerequisite: course 3 or three years of high school French or advanced placement standing. Miss Hamel in charge

#### 4G. Conversational French for Graduate Students. (No credit)

Classes meet three hours weekly. Mrs. Basché

#### 5. Intermediate French.

Sections meet five hours weekly. Prerequisite: course 4 or four years of high school French or advanced placement standing. Miss Hamel in charge

#### 6. Intermediate French.

Sections meet five hours weekly. Prerequisite: course 5 or advanced placement standing.  
Miss Hamel in charge

#### 7. Advanced French.

Sections meet five hours weekly. Prerequisite: course 6 or advanced placement standing.  
Miss Hamel in charge

#### 8. Advanced French.

Sections meet five hours weekly. Prerequisite: course 7 or advanced placement standing.  
Miss Hamel in charge

#### 9. Advanced French.

Sections meet five hours weekly. Prerequisite: course 8 or advanced placement standing.  
Miss Hamel in charge

#### 10A-10D. French Conversation. (½ course each)

(Formerly numbered 8A-8D.) Sections meet three hours weekly. Prerequisite: course 3 with grade A or B or by permission of the Department.  
Mrs. Basché

#### Upper Division Courses

The prerequisite to all upper division courses except those in translation is six courses of lower division French including course 6 with a grade of B or higher or course 7 with a grade of C or higher.

All upper division courses are conducted in French. Course 114A is prerequisite to all other upper division courses in literature. No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

#### 101A-101B-101C. Grammar, Composition and Oral Expression. (½ course each)

Classes meet three hours weekly. Note: A placement examination will be administered in French 101A, and qualified students will be advanced to French 101B, 101C, 103A or 103B.  
Miss Hamel in charge

#### 101D. Creative Writing. (½ course)

Prerequisite: course 101C or consent of the instructor.  
Miss Hamel in charge

#### 102A-102B. French Phonetics; Theory and Correction of Diction. (½ course each)

Classes meet three hours weekly. French pronunciation, diction, intonation in theory and practice; phonetic transcription, phonetic evolution of the modern language; remedial exercises; recordings.  
Miss Korol in charge

#### 103A-103B-103C. Advanced Grammar and Composition. (½ course each)

Classes meet three hours weekly. Prerequisites: courses 101A-101B-101C or the equivalent. Note: A placement examination will be administered in French 103A and qualified students will be advanced to French 103B or 103C. At all events 103C will be required of all majors. This course is required of all candidates for the Standard Credential in Secondary or Elementary Teaching.  
Mrs. Brichant in charge

**114A-114B-114C. Introduction to the Study of French Literature.**

Classes meet four hours weekly. The fourth hour will be conducted as a quiz section and will deal exclusively with *explication de textes*. Sections limited to 15 students. Not open to students who have taken or are taking courses 145A-145B-145C.

114A. The Middle Ages and Renaissance.

114B. The 17th and 18th Centuries.

114C. The 19th and 20th Centuries.

Mrs. Perkins in charge

**115A-115B-115C. Medieval French Literature.**

115A. Literature of the Twelfth Century. Classes meet three hours weekly.

115B. Literature of the Thirteenth Century. Classes meet two hours weekly.

115C. Literature of the Fourteenth Century. Classes meet two hours weekly.

Mrs. Weinroth

**116A-116B-116C. The Renaissance.**

All classes meet two hours weekly. Mr. Bensimon

116A. Rabelais and His Time.

116B. Ronsard and His Time.

116C. Montaigne and His Time.

**117A-117B-117C. The Seventeenth Century.**

All classes meet two hours weekly.

117A. From Malherbe to Corneille.

117B. From Pascal to Bossuet.

117C. From Racine to Fénelon.

**118A-118B-118C. The Eighteenth Century.**

All classes meet two hours weekly. Mr. Werner

118A. Precursors of the Enlightenment (1680-1734).

118B. Confrontation (1734-1759).

118C. Advent of a New Order (1759-1789).

**118A-119D. The Nineteenth Century.**

All classes meet two hours weekly.

Mr. el Nouty and Staff

119A. From Chateaubriand to Hugo.

119B. From Balzac to Flaubert.

119C. From Verlaine to Huysmans.

119D. The Turn of the Century.

**120A-120B-120C. The Twentieth Century.**

All classes meet two hours weekly.

Mr. Pucciani and Staff

120A. Introduction to the Twentieth Century.

120B. French Literature from 1918 to 1940.

120C. French Literature from 1940 to the Present.

**132A-132B. Survey of French Culture and Institutions.**

All classes meet three hours weekly. A fourth hour may be required for the viewing of films and other laboratory activities.

Mrs. Brichant

132A. French Culture and Institutions from the Beginning to 1789.

132B. French Culture and Institutions from 1789 to the present.

**140A-140B-140C. Honors Course in French.**

Mrs. Weinroth

140A. Prerequisites: junior or senior standing in French with 3.0 grade-point average in the major, a 3.0 overall average and consent of the department Honors Committee. Intensive study of a special topic in French literature chosen from a list proposed by the instructor in charge. Readings, oral and written reports, discussion. Consult Department for class meetings.

140B. Prerequisite: course 140A. The work of 140B will be similar to that of 140A, but with increasing emphasis on individual study. The student will select the topic for his senior essay in this course. Consult instructor for class meetings.

140C. Supervised preparation of an Honors Essay. The student will be expected to work individually, to consult with the instructor frequently, but there will be no regularly scheduled class meetings. Consult instructor for class meetings.

**199. Special Studies in French. (½ to 2 courses)**

Prerequisites: senior standing and consent of the instructor; course may be taken twice. The Staff

Courses in Which No Knowledge of French is Required

May not be taken for major or graduate credit.

**145A-145B-145C. Masterpieces of French Literature.**

(Formerly numbered 114M-114N and 115M-115N.) Classes will meet three hours weekly.

145A. The Middle Ages and Renaissance.

145B. The 17th and 18th Centuries.

145C. The 19th and 20th Centuries.

**146. The Novel of the Nineteenth Century.**

Classes will meet two hours weekly.

**147. The Novel of the Twentieth Century.**

Classes will meet two hours weekly. Miss Atlas

**148. Cinema and Literature in Contemporary France.**

Classes will meet two hours weekly. Additional hours may be required for the viewing of films and other laboratory activities. Miss Atlas

**Graduate Courses**

Concerning conditions for admission to graduate courses, see page 161 of this bulletin.

**201A-201B. Composition and Style.**

201A. Thème et Version. Course meets three times weekly. Required for the M.A. and Ph.D. degrees.

201B. La Dissertation Française. Course meets three times weekly. Required for the M.A. and Ph.D. degrees.

**202. Explication de Textes.**

(Formerly numbered 230.) Course meets three times weekly. Required for the M.A. and Ph.D. degrees.

**203A-203B-203C. French Literary Criticism.**

(Formerly numbered 231.)

**203A.** The History of Literary Criticism from Aristotle to Sainte-Beuve. Course meets twice weekly. Required for the Ph.D. degree.

**203B.** Modern Theories of Criticism. Course meets twice weekly. Required for the Ph.D., degree.

**203C.** The Techniques of Literary Criticism. Course meets twice weekly.

**204A. Phonology and Morphology from Vulgar Latin to French Classicism.**

The evolution of the French language. Required of candidates for the Ph.D. in Romance Languages and Literatures who emphasize philology.

Mr. La Du

**204B. Syntax and Semantics from Vulgar Latin to French Classicism.**

The evolution of the French language. Required of candidates for the Ph.D. in Romance Languages and Literatures who emphasize philology.

Mr. La Du

**205A-205B-205C. The Intellectual Background of French Literature.**

Mr. Pucciani

**205A.** Scholasticism (with ancient sources); Humanism. Required for the Ph.D. degree.

**205B.** Rationalism, Empiricism, Positivism. Required for the Ph.D. degree.

**205C.** Idealism, Phenomenology, Existentialism. Required for the Ph.D. degree.

**215A-215E. The Medieval Language and Literature.**

(Formerly numbered 203A-203B and 215A-215B.)

**215A.** Old and Middle French. Classes meet three times weekly. This course is prerequisite to courses 215B-215E. Core course. Phonology and morphology of the language. Introduction to Old French texts.

Mrs. Weinroth

**215B.** The Chansons de geste. Classes will meet twice weekly. Core course.

Mrs. Weinroth

**215C.** The Romance. Classes will meet twice weekly. Core course.

Mr. La Du

**215D.** Medieval Theater. Classes will meet twice weekly.

Mrs. Weinroth

**215E.** Provençal Poetry. Classes will meet three times weekly.

Mr. La Du

**216A-216H. The Renaissance.**

**216A.** The Generation of 1530. Two hours weekly. Core course.

Mr. Bensimon

**216B.** The Generation of 1550. Two hours weekly. Core course.

Mr. Bensimon

**216C.** The Generation of 1580. Two hours weekly. Core course.

Mr. Bensimon

**216D.** Rabelais and Prose Writers. Two hours weekly.

Mr. Bensimon

**216E.** Baroque Poetry. Two hours weekly.

Mr. Bensimon

**216F.** Montaigne. Two hours weekly.

Mr. Bensimon

**216G.** Theater. Two hours weekly.

Mrs. Perkins

**216H.** Intellectual Trends of the Renaissance. Two hours weekly.

Mr. Bensimon

**217A-217I. The Seventeenth Century.**

**217A.** Classic Theater. Two hours weekly. Core course.

**217B.** Non-Dramatic Literature. Two hours weekly. Core course.

**217C.** Classic Prose. Two hours weekly. Core course.

**217D.** Molière. Two hours weekly.

**217E.** Corneille. Two hours weekly. Mrs. Perkins

**217F.** Racine. Two hours weekly.

**217G.** The Novel. Two hours weekly.

**217H.** Moralists. Two hours weekly.

**217I.** Religious Thought. Two hours weekly.

**218A-218D. The Eighteenth Century.**

**218A.** Fontenelle, Bayle, Montesquieu, Prévost. Two hours weekly. Core course.

Mr. Werner

**218B.** Diderot and the Encyclopedia. Two hours weekly. Core course.

Mr. Werner

**218C.** Voltaire and J. J. Rousseau. Two hours weekly. Core course.

Mr. Werner

**218D.** The Theater and the Novel. Two hours weekly.

Mr. Werner

**219A-219K. The Nineteenth Century.**

Mr. el Nouty

**219A.** Romanticism. Two hours weekly. Core course.

**219B.** Realism and Naturalism. Two hours weekly. Core course.

**219C.** Symbolism. Two hours weekly. Core course.

**219D.** Poetry. Two hours weekly.

**219E.** The Novel. Two hours weekly.

**219F.** The Theater. Two hours weekly.

**219G.** Historians and Critics. Two hours weekly.

**219H.** Victor Hugo. Two hours weekly.

**219I.** Balzac. Two hours weekly.

**219J.** Independent Novelists. Two hours weekly.

**219K.** Intellectual Trends. Two hours weekly.

**220A-220P. The Twentieth Century.**

**220A.** From Symbolism to Surrealism. Two hours weekly. Core course.

Mr. Pucciani and the Staff

**220B.** From Surrealism to Existentialism. Two hours weekly. Core course.

Mr. Pucciani and the Staff

**220C.** From Existentialism to the Present. Two hours weekly. Core course.

Mr. Pucciani and the Staff

**220D.** Paul Valéry. Two hours weekly.

Mr. Pucciani and the Staff

**220E.** Marcel Proust. Two hours weekly.

Mr. Pucciani and the Staff

**220F.** André Gide. Two hours weekly.

Mr. Pucciani and the Staff

**220G.** André Malraux. Two hours weekly.

Mr. Pucciani and the Staff

**220H.** The Theater. Two hours weekly.

Mr. Pucciani and the Staff

**220I.** The Anti-Theater. Two hours weekly.

Mr. Pucciani and the Staff

**220J.** The Novel. Two hours weekly.

Mr. Pucciani and the Staff

**220K.** The Anti-Novel. Two hours weekly.

Mr. Pucciani and the Staff

**220L.** Surrealism. Two hours weekly.

Mr. Pucciani and the Staff

- 230M.** Existentialism. Two hours weekly.  
Mr. Pucciani and the Staff
- 220O.** Poetry. Two hours weekly.  
Mr. Pucciani and the Staff
- 230P.** Cinema and Literature. Two hours weekly.  
Mr. Pucciani and the Staff

- 221A-221D.** French-African Literature. Mr. el Nouty
- 221A.** Introduction to the Study of the French-African Literatures. Two hours weekly. Core course.
- 221B.** French-African Literature of Madagascar and Bantu Africa. Two hours weekly. Core course.
- 221C.** French-African Literature of Berbero-Sudanese and Arabo-Islamic Africa. Two hours weekly. Core course.
- 221D.** Franco-Caribbean Literature.

**Seminars**

- 250A-250B.** Studies in Medieval Literature.  
Mr. La Du and the Staff
- 251A-251B.** Studies in the Renaissance.  
Mr. Bensimon and the Staff
- 252A-252B.** Studies in the Baroque.  
Mr. Bensimon and the Staff
- 253A-253B.** Studies in the Seventeenth Century.  
The Staff
- 254A-254B.** Studies in the Eighteenth Century.  
Mr. Werner and the Staff
- 255A-255B.** Studies in the Nineteenth Century.  
Mr. el Nouty and the Staff
- 256A-256B.** Studies in Contemporary Literature.  
Mr. Pucciani and the Staff
- 257A-257B.** Studies in the French African Literature.  
Mr. el Nouty and the Staff
- 258A-258B.** Studies in Literary Criticism. The Staff
- 259A-259B.** Studies in Philosophy and Literature.  
The Staff
- 260A-260B.** Studies in the History of Ideas.  
Seminars will meet as announced. Only the first

meeting will be scheduled. Candidates for the Ph.D. will be required to take 4 seminars, 2 of which must be in their field of special interest. The Staff

**Professional Courses**

- 310A-310B.** The Teaching of French in the Elementary School and at the Junior High Level.  
Mrs. Walker
- 310A.** Prerequisite: consent of the instructor. Theory of French Teaching in the Elementary School and at the Junior High Level. Classes meet three hours weekly. Required for the Standard Elementary Credential. Mrs. Walker
- 310B.** Observation of Language Teaching in the Elementary School and at the Junior High Level. Classes will meet as announced. Required for the Standard Elementary Credential. Mrs. Walker
- 370.** The Teaching of French in the Secondary School and at the College Level: Observation.  
Prerequisites: French 101A-B-C, 102A-B, 103A-B-C. Observation of Language Teaching in the Secondary School and at the College Level.
- 372.** The Language Laboratory. (½ course)  
Two hours weekly. Prerequisite: consent of the instructor. New electronic techniques for language instruction. Pedagogical and practical problems of making tapes, installing and organizing a laboratory; control procedures. Mr. de Martini
- 495.** The Teaching of French in the Secondary Schools and at the College Level.  
Prerequisite. French 370. Theory of Language teaching. Mr. Pucciani
- Individual Study and Research**
- 596.** Directed Individual Studies or Research. (½ to 1 course) The Staff
- 597.** Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ to 2 courses) The Staff
- 599.** Research for and Preparation of the Doctoral Dissertation. (½ to 2 courses) The Staff

■ **GENETICS**

For courses in genetics, see under departments of Bacteriology, Botanical Sciences, and Zoology.

■ **GEOCHEMISTRY**

Interdepartmental Committee for Graduate Study in Geochemistry. K. D. Bayes, Chemistry; D. Carlisle, Geology; W. G. Ernst, Geology and Geophysics; I. R. Kaplan, Geology and Geophysics; G. C. Kennedy, Geophysics and Geology; W. F. Libby,

Chemistry and Geophysics; W. W. Rubey, Geology and Geophysics; J. W. Schopf, Geology; J. T. Wasson, Chemistry and Geophysics (chairman and graduate adviser); G. W. Wetherill, Geophysics, Geology, Planetary and Space Science.

**Undergraduate Study**

Undergraduate students who wish to prepare for graduate work in geochemistry are advised to complete an undergraduate major in chemistry or in geology with a strong preparation in chemistry. It is recommended that such students consult with the appropriate undergraduate adviser in the Department of Geology.

**Graduate Study**

A program of graduate study leading to the degrees of M.S. and Ph.D. in Geochemistry is offered under the sponsorship of the interdepartmental committee. The curriculum is open to students having an outstanding undergraduate record in the basic sciences, physics, chemistry and mathematics. The bachelor's degree may be in chemistry, geology, physics or in some other field. Because of the diverse backgrounds of students entering this interdepartmental curriculum, individual programs of instruction and ex-

aminations will be arranged. Course offerings from the Departments of Chemistry, Geology and Planetary and Space Science will form a major portion of these recommended programs of study.

Research facilities in the Departments of Chemistry and Geology and the Institute of Geophysics and Planetary Physics are available to students in this curriculum. Among these are an electron microprobe, facilities for neutron activation analysis, high pressure laboratories, mass spectrometric equipment, facilities for measurement of tritium and radiocarbon, X-ray fluorescence and diffraction apparatus, an atomic absorption spectrometer, and apparatus for mineral synthesis and the study of phase equilibria.

A program leading to the Ph.D. in Geology, with emphasis in Geochemistry, is also offered by the Department of Geology.

For further information regarding admission, financial support, and programs of study, consult the graduate adviser.

**■ GEOGRAPHY**

(Department Office, 1255 Bunche Hall)

Charles F. Bennett, Ph.D., *Professor of Geography.*

Henry J. Bruman, Ph.D., *Professor of Geography.*

Huey L. Kostanick, Ph.D., *Professor of Geography.*

Richard F. Logan, Ph.D., *Professor of Geography.*

Clifford H. MacFadden, Ph.D., *Professor of Geography.*

Tom L. McKnight, Ph.D., *Professor of Geography.*

Howard J. Nelson, Ph.D., *Professor of Geography (Chairman of the Department).*

Jonathan D. Sauer, Ph.D., *Professor of Geography.*

Joseph E. Spencer, Ph.D., *Professor of Geography.*

Benjamin E. Thomas, Ph.D., *Professor of Geography.*

Norman J. W. Thrower, Ph.D., *Professor of Geography.*

Ruth Emily Baugh, Ph.D., *Emeritus Professor of Geography.*

Robert M. Glendinning, Ph.D., *Emeritus Professor of Geography.*

George McCutchen McBride, Ph.D., LL.D., *Emeritus Professor of Geography.*

Clifford M. Zierer, Ph.D., *Emeritus Professor of Geography.*

Gary S. Dunbar, Ph.D., *Associate Professor of Geography.*

Antony R. Orme, Ph.D., *Associate Professor of Geography.*

Gerry A. Hale, Ph.D., *Assistant Professor of Geography.*

Werner H. Terjung, Ph.D., *Assistant Professor of Geography.*



Christopher Salter, M.A., *Acting Assistant Professor of Geography.*

**Preparation for the Major**

Geography 1A-1B-1C are required of all majors. Transfer students must consult a departmental adviser prior to arranging a program. All prospective majors must consult a departmental adviser to plan a lower

division program which will enable them to take advanced work in one or more fields of concentration which are allied to geography. A mathematics sequence such as Mathematics 2A-2B-2C or 3A-3B-3C or 11A-11B-11C or an acceptable sequence in statistics is also recommended.

Three general objectives may be recognized for those who select geography as a major. These are: 1) a broad understanding of the world, its conditions, and its peoples, leading to a liberal education, 2) preparation for graduate study in the subject leading to advanced degrees and professional occupation as a geographer, and 3) preparation for the student who desires a teaching credential with a specialty in geography and the physical or social sciences. Students majoring in geography must consult a departmental adviser for the planning of a program suitable to the desired objective.

### The Major

The minimum requirement for the major is ten upper division courses in geography chosen in consultation with a departmental adviser. All majors must take the two required courses in Group I—Geography 110 and 120. In addition, *one* course chosen from Group II—Geography 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190; and *two* courses chosen from Group III—Geography 112, 114, 116, 160, 162, 166, 172, 176; and *two* courses chosen from Group IV—Geography 122, 124, 130, 132, 134A–134B, 140, 150, 152, 164, 198; and *three* courses chosen from Group V—Geography 110 through 198 (excluding 191). Students planning to do graduate work in geography should take Geography 170 and when possible, appropriate courses in departments outside the major field.

**Allied Fields.** Every geography major shall develop some competence in one or two allied fields. This program which must be approved by the department consists of a group of at least four upper division courses chosen from not more than two departments in such subjects as will provide a concentration allied to the field of specialization within the major.

### Admission to Graduate Status

For admission to graduate status in the Geography Department a student should normally have completed the undergraduate major or its equivalent; have received a bachelor's degree or its equivalent from an acceptable college or university; and have maintained at least a B average in all courses taken in the junior and senior years. Prospective students are required to take the Graduate Record Aptitude Test and the Advanced Test in Geography, and in addition, to provide the Department with three letters of evaluation from previous instructors. Students not meeting the grade average require-

ments may be admitted in exceptional cases if their letters of evaluation and their Graduate Record Examination scores or other evidence indicate that they have unusual promise. Students may be admitted with subject deficiencies, but such deficiencies will have to be made up.

Information and applications for the Graduate Record Examination may be obtained by writing to the Educational Testing Service, 1947 Center Street, Berkeley, California 94704 or Box 955, Princeton, New Jersey 08540.

### Requirements for the General Secondary Teaching Credential

Consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

### Requirements for the Master's Degree

The general requirements of the Graduate Division are listed on pages 153–154, and the specific requirements of the Department of Geography follow.

The M.A. degree may be obtained either by the Thesis Plan or the Comprehensive Examination Plan.

**Diagnostic Examination.** Required under both the Thesis Plan or the Comprehensive Examination Plan. The examination will be given by the candidate's informal guidance committee in the course of the first quarter in residence, to assess the candidate's general competence in the field of geography up to the graduate level.

**Review.** During the third quarter of residence the graduate advisory committee will review the progress of each student. The results of this review will determine whether or not the student shall be permitted to proceed toward the M.A. degree.

**Foreign Language.** Required under both the Thesis Plan and the Comprehensive Examination Plan is a reading knowledge of a foreign language appropriate to the candidate's field of specialization and approved by the chairman of his guidance committee and the graduate adviser.

**Thesis Plan.** 1. The work in residence must include at least nine courses, including a minimum of six courses at the graduate level, of which Geography 200 (Growth of Geographic Thought), and at least one seminar, are required. In addition, a student who has not had an acceptable field course will be required to take Geography 270 (Advanced Field Analysis). The balance of each program must be worked out in consultation with the graduate adviser.

2. Each student must present a thesis, based in whole or in part on original investigation, and preferably a field study. Selection of a thesis topic, conduct of the investigation, and final organization, proceeds initially under the supervision of an informal guidance committee (two members of the Department staff) and, later, under an official Graduate Division committee (two members of the Department staff, plus one member from another University department).

*Comprehensive Examination Plan.* 1. The work in residence must include a minimum of nine courses, at least six of which must be at the graduate level, of which Geography 200 (Growth of Geographic Thought) and at least one seminar, are required. The balance of each program must be worked out in consultation with the graduate adviser.

2. The comprehensive examination normally is given in the final two-week period of the quarter in which the candidate completes his work for the degree. It may consist of two or three half-day written examinations covering the broad divisions of history of geography, systematic geography, regional geography, and functional applications of systematic geography. The examination is designed to test for broad grasp of subject, as well as the more specialized abilities of the candidate.

3. In addition, for students who plan to go on for the Ph.D. in this department, a research paper is required. The student will write the paper in the field of his special interest under the supervision of a guidance committee. The topic will be assigned by the committee in consultation with the student; it will have an average of 10,000 words, and will be completed within a 10-week period.

#### **Requirements for the Doctor's Degree**

General requirements of the Graduate Division are stated on page 156, and specific requirements of the Department of Geography follow.

1. An M.A. or M.S. degree, with a geography specialty is recommended of all students undertaking work toward the Ph.D. degree.

2. Each student must satisfactorily complete Geography 200 (Growth of Geographic Thought), and 270 (Advanced Field Analysis) or their equivalent.

3. During the third quarter of residence the graduate advisory committee will review the progress of each student. The results of this review will determine whether or not

the student shall be permitted to proceed toward the Ph.D. degree.

4. Preliminary examinations may consist of oral or written examinations, at the discretion of the guidance committee. At the minimum, there shall be a written examination covering both general and specific aspects of the geographical field, as well as the student's particular fields of specialization. This examination also shall include a field problem in local geography.

5. Foreign Language Requirement. A candidate may satisfy the department's language-research tool requirement by one of three methods. The method chosen shall be the one most appropriate to the candidate's field of specialization and must be approved by the chairman of his guidance committee and the graduate adviser: (a) A reading knowledge of two foreign languages; or (b) A reading knowledge of one foreign language plus proficiency in conversation in that language; or (c) A reading knowledge of one foreign language plus the mastery of an alternate research tool as approved by the department.

6. The qualifying examination is an oral examination conducted by the candidate's official Ph.D. committee. This examination stresses particularly those segments of geography in which the candidate has specialized.

7. Each candidate is required to select a dissertation topic approved by his doctoral committee and the department. A topic entailing field, as well as library study, normally is required.

8. The final examination is an oral defense of the dissertation conducted by the candidate's official Ph.D. committee which will be held just prior to the preparation of the final official typescript of the dissertation.

#### **Lower Division Courses**

##### **1A. Introduction to Geography: Physical Elements.**

(Formerly numbered 1.) Lecture, three hours; laboratory-discussion, one hour. A study of the basic physical elements of geography (especially climate, landforms, soils, and natural vegetation), and their integrated patterns of world distribution. The Staff

##### **1B. Introduction to Geography: Cultural Elements.**

(Formerly numbered 2.) Lecture, three hours; reading period, one hour. A study of the basic cultural elements of geography (population distribution, general land-use patterns, and trade) and their correlation with the physical elements. Delimitation of the major geographic regions of the world. The Staff

##### **1C. Introduction to Geography: Geographic Analysis.**

Lecture, one hour; laboratory-discussion, three hours. Prerequisites: courses 1A, 1B, or equivalent.



or consent of the instructor. A study of the relationships and integration of the fundamental physical and cultural elements of geography into major world geographic regions. The Staff

### 5. Man and the Earth Ecosystem.

Lecture, three hours; reading period, one hour. An examination of the historical and contemporary roles of man as a major agent of biological change in the earth ecosystem. Mr. Bennett

### 10A. World Regional Geography: The Americas.

Lecture, three hours; reading period, one hour. Analysis of the physical and cultural features that characterize and differentiate the geographical landscapes and regions of the Americas. The Staff

### 10B. World Regional Geography: Eurasia (excluding Middle East).

Lecture, three hours; reading period, one hour. Analysis of the physical and cultural features that characterize and differentiate the geographical landscapes and regions of Eurasia. The Staff

### 10C. World Regional Geography: Africa and the Middle East.

Lecture, three hours; reading period, one hour. Analysis of the physical and cultural features that characterize and differentiate the geographical landscapes and regions of Africa and the Middle East. Mr. Hale

#### Upper Division Courses

Course 101 may not be counted toward the upper division requirement for the major.

### 101. Principles of Geography.

(Formerly numbered 100.) Lecture, three hours; reading period, one hour. For transfer students only, with at least junior standing, in lieu of courses 1A-1B, and not to be counted on the major. A survey of the basic physical and cultural elements of geography and their integration on a world regional basis. The Staff

### 110. Physical Bases of Geography.

Lecture, three hours; reading period, one hour. Prerequisites: course 1A-1B-1C or equivalent, or upper division standing, or consent of the instructor. A study of the growth, scope, models and techniques of physical geography. Mr. Orme

### 112. Geomorphology.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B or equivalent; junior standing or consent of the instructor. A study of the processes responsible for shaping the world's landforms with emphasis on the relationship between the energy and materials involved and the magnitude and organization of the surface forms produced. Mr. Orme

### 114. Climatology.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B-1C or equivalent; or Meteorology 4A-4B, or meteorology special science course; or junior standing or consent of the instructor. A study of the causes of climatic phenomena and of the larger features which characterize the climates of the earth, with special emphasis on energy balance climatology and bioclimatology. Mr. Terjung

### 116. Soils.

(Formerly numbered 116.) Lecture, three hours; reading period, one hour. Prerequisites: course 1B or equivalent, or junior standing; course 1A, and Chemistry 1A or 2A, or consent of the instructor. A study of the origins, evolution, properties and utilization of soils, with special emphasis on the world's major soil groups. The Staff

### 120. Cultural Bases of Geography.

(Formerly numbered 175.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. The geographic aspects of cultural factors in the evolution of primitive cultures and advanced civilizations. Mr. Hale, Mr. Salter, Mr. Spencer

### 122. Population and Settlement.

(Formerly numbered 174.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. Past and present patterns of human population and of rural and urban settlement in selected areas involving theoretical considerations and analyses. The Staff

### 124. Historical Geography of the United States.

(Formerly numbered 171.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of the evolution of the cultural landscapes of the area that is now the United States. Examination of past geographies and of geographical change through time. Mr. Dunbar

### 130. Economic Bases of Geography.

(Formerly numbered 141.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. The principles of economic geography as developed through regional studies of economic phenomena, with special emphasis upon man's foodstuffs, minerals, and power resources. Mr. MacFadden

### 132. Industry and Resources.

(Formerly numbered 142.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. Analysis of the character and regionalization of industrial developments within the developed and developing countries of the world, and their relationships to the distribution of industrial resources, with special emphasis on minerals and power and fuel supplies. Mr. MacFadden

### 134A. Conservation of Resources: North America.

Lecture, three hours; reading period one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. An analysis of the basic principles and problems associated with the conservation of natural resources in the United States and Canada. Mr. McKnight

### 134B. Conservation of Resources: Underdeveloped World.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. An analysis of the principles and problems of the conservation of natural resources of the underdeveloped world. Mr. Bennett

### 140. Political Geography.

(Formerly numbered 181.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-

1B, or equivalent, or upper division standing. The principles of political geography as developed through regional studies of political phenomena throughout the world. Current problems in domestic and international affairs will be considered.

Mr. Kostañick

#### 150. Urban Geography.

(Formerly numbered 155.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of the origin, development, distribution, and regional variation of the world's cities, with emphasis on an analysis of the functions and patterns of American cities.

Mr. Clark, Mr. Nelson

#### 152. Urban Planning.

(Formerly numbered 156.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of urban planning with special emphasis on the role of the geographer in the planning process.

The Staff

#### 160. Plant Geography.

(Formerly numbered 118.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing, and Biology 2, or equivalent, or consent of the instructor. Characteristics, distribution, environmental and cultural relationships of the principal vegetation patterns.

Mr. Sauer

#### 162. Animal Geography.

(Formerly numbered 117.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing, and Biology 2, or equivalent, or consent of the instructor. A study of the physical and cultural factors of animal distribution and an examination of the role of animals in human societies.

Mr. Bennett

#### 164. Historical Geography of Crop Plants.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B and Biology 2, or equivalents, or consent of instructor. Geographic patterns of domestication and diffusion of useful plants from antiquity to the present, based on detailed case histories of selected species.

Mr. Sauer

#### 166. Plant Migration.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B and Biology 2, or equivalent, or consent of instructor. Mechanisms of geographic patterning of natural and artificially modified vegetation. Emphasis on range changes for which there is direct fossil or documentary evidence.

Mr. Sauer

#### 170. Field Analysis.

(Formerly numbered 101.) Saturday field trips, 8-5. Prerequisites: courses 1A-1B-1C, 110, 120, or equivalent, and consent of the instructor. The basic methods of geographic analysis of small areas, embracing both rural and urban types and physical, cultural and economic aspects. Training carried on chiefly in the field.

Mr. Logan

#### 172. Cartography.

(Formerly numbered 105.) Laboratory, four hours; independent work, two hours. Prerequisites: courses 1A-1B, or equivalent, or upper division standing, and consent of the instructor. Survey of the field of cartography. Includes theory and construction of map projections, compilation procedures, principles

of generalization, symbolization, terrain representation, lettering, drafting and scribing, and map reproduction methods.

The Staff

#### 176. Quantitative Analysis.

(Formerly numbered 109.) Lecture, three hours; laboratory, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. An introduction to the methods of measurement and interpretation of geographic distributions and associations.

Mr. Clark

#### 180. Anglo-America.

(Formerly numbered 121.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. Delimitation and analysis of the principal geographic regions of the United States and Canada.

Mr. McKnight, Mr. Nelson

#### 181. Middle America.

(Formerly numbered 122A.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of the geographic factors, physical and cultural, that are basic to an understanding of the historical development of Middle America and of the contemporary economic and cultural geography of Mexico and the countries of Central America and the West Indies.

Mr. Bennett, Mr. Bruman

#### 182. South America.

(Formerly numbered 122B.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of the geographic factors, physical and cultural, that are basic to an understanding of the historical development of South America and of the contemporary economic and cultural geography of the individual South American countries.

Mr. Bruman

#### 183. Europe.

(Formerly numbered 123A.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of geographic conditions and their relation to economic, social and political problems in Europe.

Mr. Kostañick, Mr. Thrower

#### 184. Soviet Union.

(Formerly numbered 123B.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A study of geographic conditions and their relation to economic, social, and political problems in the Soviet Union.

Mr. Kostañick

#### 185. Southern Asia.

(Formerly numbered 124A.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A regional survey of the physical and cultural features which characterize the economic, social, and political geography of southern Asia (India through the East Indies) during historic and modern times.

Mr. MacFadden

#### 186. Eastern Asia.

(Formerly numbered 124B.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A regional survey of the physical and cultural features which characterize the economic, social, and political geography of eastern Asia (China, Korea, and Japan).

Mr. Salter, Mr. Spencer

**187. Middle East.**

(Formerly numbered 127.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A regional survey of the physical and cultural features which characterize the economic, social, and political geography of southwestern Asia during historic and modern times. Mr. Hale

**188. Northern Africa.**

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. The regions of north Africa, including the Sahara, in terms of physical features, human settlement, economic production, and political patterns. Mr. Hale, Mr. Thomas

**189. Middle and Southern Africa.**

(Formerly numbered 126.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. The regions of Africa south of the Sahara (middle and south Africa) in terms of physical features, human settlement, economic production, and political patterns. Mr. Thomas

**190. Australasia.**

(Formerly numbered 125.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A regional synthesis of the physical and cultural features which characterize Australia, New Zealand, and the islands of the South Pacific. Mr. McKnight

**191. California.**

(Formerly numbered 131.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. A systematic and regional treatment of the geography of California including the physical, cultural, and economic aspects and detailed studies of the various regions. Mr. Logan, Mr. McKnight

**198. Proseminar in Geography.**

(Formerly numbered 190.) Staff-student discussions, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, and courses 110 and 120 and junior standing. Staff-student colloquium on the historical and modern conceptual principles of geographical theory, including schools of geographic thought and contributions of particular scholars. Mr. Spencer

**199. Special Study. (½ to 2 courses)**

Study schedule to be arranged individually with the instructor. Prerequisites: courses 1A-1B, or equivalent; senior standing and consent of the instructor. The Staff

**Graduate Courses****200. Growth of Geographic Thought.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: consent of the instructor. Lectures and discussions on the comparative development of the philosophy and operative thought of geographers in different countries, stressing the origins and foundations of American Geographic thought. Mr. Dunbar, Mr. Spencer, Mr. Thomas

**205. Seminar: Geographic Thought.**

(Formerly numbered 250.) Discussion session, three hours; reading period, two hours. Prerequisites:

course 200, or equivalent, and consent of the instructor. Discussions and studies of particular themes and topics significant to the growth of the modern philosophy of geography. Mr. Spencer, Mr. Thomas

**212. Advanced Geomorphology.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 112 or equivalent, or consent of the instructor. An extended study of selected geomorphic processes and landforms. Mr. Logan, Mr. Orme

**213. Seminar: Geomorphology.**

Lecture, three hours; reading period, two hours. Prerequisites: course 212 or equivalent and consent of the instructor. Selected geomorphic topics with emphasis on current research frontiers and techniques. May be repeated for credit. Mr. Orme

**214. Advanced Climatology.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 114, or equivalent, or consent of the instructor. A survey of the major literature of climatology: dynamic, energy balance, bioclimatic, urban. Mr. Terjung

**215. Seminar: Climatology.**

Discussion session, three hours; reading period, two hours. Prerequisites: course 214 or equivalent and consent of the instructor. Selected topics. May be repeated for credit. Mr. Terjung

**216. Seminar: Quaternary Studies.**

Discussion, three hours; reading period, two hours. Prerequisites: course 212 or 214 or 260 or 262; or appropriate graduate course in anthropology, botany, geology or zoology; or consent of the instructor. An analysis of the changing environment of the Quaternary era. Mr. Orme

**220. Advanced Cultural Geography.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisites: course 120, or equivalent, or consent of the instructor. Lectures and discussions around specific aspects of the development of cultural landscapes in different geographic environments. Mr. Spencer

**222. Historical Geography of the United States.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisites: course 124 and consent of the instructor. Some major themes in American historical geography. Mr. Dunbar

**223. Seminar: Historical Geography.**

Discussion session, three hours; reading period, two hours. Prerequisites: course 222 and consent of the instructor. Theory and practice of historical geography in North America and Europe. Mr. Dunbar

**225. Seminar: Cultural Geography.**

(Formerly numbered 272.) Discussion session, three hours; reading period, two hours. Prerequisites: course 220 or 222, or equivalent and consent of the instructor. Discussions centered around particular topics in cultural geography; topics may vary from year to year. The Staff

**230. Advanced Economic Geography.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 130 or 132, or equivalent, or consent of the instructor.

An analysis of the geographic problems of economic development in selected regions of the world.

Mr. MacFadden

### 232. Geographical Aspects of Land Planning.

(Formerly numbered 165.) Lecture, two hours; discussion session, two hours. Prerequisites: course 110, 120, or equivalent, and consent of the instructor. The role of the geographer and the geographic discipline in land planning activities. The Staff

### 235. Seminar: Economic Geography.

(Formerly numbered 270.) Discussion session, three hours; reading period, two hours. Prerequisites: course 230 or 232, or equivalent, and consent of the instructor. Related research projects growing out of courses 230 and 232. The Staff

### 240. Advanced Political Geography.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 140 or equivalent or consent of the instructor. Intensive study of the theories and principles of political geography and German geopolitics. Selected regions will be used as specific examples of differing techniques of study in geopolitics. Mr. Kostanick

### 245. Seminar: Political Geography.

(Formerly numbered 271.) Discussion session, three hours; reading period, two hours. Prerequisites: course 240, or equivalent and consent of the instructor. Related research projects growing out of course 240. The Staff

### 250. Advanced Urban Geography.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 150 or 152, or equivalent, or consent of the instructor. Treatment of the evolution, morphology, and function of cities with emphasis on theory and methods of analysis. Mr. Clark, Mr. Nelson

### 255. Seminar: Urban Geography.

Discussion session, three hours; reading period, two hours. Prerequisites: course 250, or equivalent, and consent of the instructor. Related research projects growing out of course 250. The Staff

### 260. Advanced Biogeography: Animals.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 160 or 162, or equivalent, or consent of the instructor. An intensive review and analysis of biophysical and cultural factors influencing animal distributions. Mr. Bennett

### 262. Advanced Biogeography: Plants.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 160 or 162 or 166, or equivalent, or consent of the instructor. An intensive review and analysis of physical and cultural factors influencing plant distributions. Mr. Sauer

### 265. Seminar: Biogeography.

Discussion session, three hours; reading period, two hours. Prerequisites: course 260, 262 or equivalent and consent of the instructor. Research projects related to or growing out of course 260 or 262. The Staff

### 270. Advanced Field Analysis.

Saturday field trips, 8-5. Prerequisite: consent of the instructor. Training in the analysis and evalua-

tion of the geographical characteristics of the physical environment and the human utilization thereof.

Mr. Logan

### 272. Advanced Cartography.

Laboratory, three hours; independent work, two hours. Prerequisite: course 172 or equivalent, or consent of the instructor. Advanced work in the theory and practical application of modern cartographic principles. Special emphasis is placed on terrain representation, quantitative and computer mapping, scribing, color separation, and reproduction of maps. Mr. Thrower

### 274. Photo Interpretation and Remote Sensing.

Laboratory, three hours; independent work, two hours. Prerequisite: course 172 or equivalent or consent of instructor. The study of aerial photographs and other remote sensing images as tools for geographical research. Particular attention is placed on the analysis of landscapes and the interpretation of interrelationships of individual features in their physical and cultural complex. Mr. Thrower

### 276. Advanced Quantitative Analysis.

Lecture, two hours; laboratory, two hours. Prerequisite: course 176 or equivalent or consent of the instructor. Advanced topics in the utilization of mathematical and statistical techniques for geographic research. Included in the course is a discussion of the geographic uses of various sampling procedures, multivariate analysis, nonparametric statistics, and other advanced research techniques. Mr. Clark

### 278. Methods in Field Investigations. (2 courses)

Each section may be repeated for credit.

#### 278A. Field Methods in Regional Geography.

Prerequisite: consent of the instructor. Advanced field study in several contrasting environments, utilizing both reconnaissance and intensive methods, in the investigation of significant physical and cultural features from both the systematic and regional viewpoints. Mr. Logan

#### 278B. Field Methods in Microclimatology.

(Formerly numbered 217.) Prerequisite: consent of the instructor. The distribution of the exchanges and budgets of energy, matter, and momentum and their interrelations will be examined instrumentally in the context of biological ecosystems (man, animals, plants) and the urban environment. Mr. Terjung

#### 278C. Field Methods in Geomorphology.

Prerequisite: consent of the instructor. The observation, measurement, and analysis of the forms, materials, and processes of selected geomorphic environments. Mr. Orme

### 280. Anglo-America.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 180 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in Anglo-America. Mr. McKnight, Mr. Nelson

### 281. Latin America.

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 181 or 182 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in Latin America. Mr. Bennett, Mr. Bruman

**283. Europe.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 183 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in Europe. Mr. Kostanick, Mr. Thrower

**284. Soviet Union.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 184 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in the Soviet Union. Mr. Kostanick

**285. Asia.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 185 or 186 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in non-Soviet Asia. Mr. MacFadden, Mr. Spencer

**288. Africa.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 187 or 188 or 189 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in Africa. Mr. Hale, Mr. Thomas

**289. Australasia.**

Lecture, two hours; discussion session, one hour; reading period, one hour. Prerequisite: course 190 or equivalent or consent of the instructor. A study of the geographic conditions and their relation to economic, social, and political problems in selected regions in Australia, New Zealand, and Oceania. Mr. McKnight

**290A-290K. Seminars in Regional Geography.**

Selected topics for each seminar. Each may be repeated for credit.

**290A. Anglo-America.**

Prerequisites: course 280 and consent of the instructor. Mr. McKnight, Mr. Nelson

**290B. Middle America.**

Prerequisites: course 181 and consent of the instructor. Mr. Bennett, Mr. Bruman

**290C. South America.**

Prerequisites: course 182 and consent of the instructor. Mr. Bennett, Mr. Bruman

**290D. Europe.**

Prerequisites: course 283 and consent of the instructor. Mr. Kostanick, Mr. Thrower

**290E. Soviet Union.**

Prerequisites: course 284 and consent of the instructor. Mr. Kostanick

**290F. Southern Asia.**

Prerequisites: course 285 and consent of the instructor. Mr. MacFadden

**290G. Eastern Asia.**

Prerequisites: course 285 and consent of the instructor. Mr. Spencer

**290H. Middle East.**

Prerequisites: course 288 and consent of the instructor. Mr. Hale

**290I. Northern Africa.**

Prerequisites: course 288 and consent of the instructor. Mr. Hale, Mr. Thomas

**290J. Middle and Southern Africa.**

Prerequisites: course 288 and consent of the instructor. Mr. Thomas

**290K. Australasia.**

Prerequisites: course 289 and consent of the instructor. Mr. McKnight

**291. Geography of the Arid Lands.**

(Formerly numbered 119.) Lecture, three hours; reading period, one hour. Prerequisites: courses 110, 114, 120, 160, 170 or equivalent and consent of the instructor. An investigation of the physical and cultural complexes of the world's arid regions. Salient factors emphasized include climate, landforms, water, soils, natural vegetation and the various aspects of human occupation, including future possibilities for human utilization. The Staff

**292. Seminar: Humid Tropics.**

Discussion session, three hours; reading period, two hours. Prerequisite: consent of the instructor. Selected topics. Biophysical and cultural complexes of the humid tropics with emphasis on problems related to human settlement and livelihood. May be repeated for credit. Mr. Bennett

**Individual Study and Research****596. Directed Individual Study or Research.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**597. Preparation for M.A. Comprehensive Examination or Ph.D. Qualifying Examination.**

(½ to 2 courses)

Special individual study. Prerequisite: consent of the instructor. The Staff

**598. Research for and Preparation of the Masters**

**Thesis. (½ to 2 courses)**

Independent study. Prerequisite: consent of the instructor. The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (½ to 2 courses)**

Independent study. Prerequisite: consent of the instructor. The Staff

**■ GEOLOGY**

(Department Office, 3806 Geology Building)

†Donald Carlisle, Ph.D., *Professor of Geology.*

John M. Christie, Ph.D., *Professor of Geology.*

†\*W. Gary Ernst, Ph.D., *Professor of Geology and Geophysics.*

† Absent on leave, 1970-1971.

\*\* Member of the Institute of Geophysics and Planetary Physics.

- † Clarence A. Hall, Jr. Ph.D., *Professor of Geology.*  
 †\*\* Isaac R. Kaplan, Ph.D., *Professor of Geology and Geophysics.*  
 †\*\* George C. Kennedy, Ph.D., *Professor of Geochemistry and Geology.*  
 Helen Tappan Loeblich, Ph.D., *Professor of Geology.*  
 Clemens A. Nelson, Ph.D., *Professor of Geology (Chairman of the Department).*  
 Gerhard Oertel, Dr.rer.nat., *Professor of Geology.*  
 John L. Rosenfeld, Ph.D., *Professor of Geology.*  
 \*\* Ronald L. Shreve, Ph.D., *Professor of Geology and Geophysics.*  
 Kenneth D. Watson, Ph.D., *Professor of Geology.*  
 \*\* George W. Wetherill, Ph.D., *Professor of Geophysics and Geology.*  
 U. S. Grant IV, Ph.D., *Emeritus Professor of Geology.*  
 Joseph Murdoch, Ph.D., *Emeritus Professor of Geology.*  
 Willis P. Popenoe, Ph.D., *Emeritus Professor of Geology.*  
 \*\* William W. Rubey, D.Sc., *Emeritus Professor of Geology and Geophysics.*  
 N. Gary Lane, Ph.D., *Associate Professor of Geology.*  
 James H. Dieterich, Ph.D., *Assistant Professor of Geology.*  
 Wayne A. Dollase, Ph.D., *Assistant Professor of Geology.*  
 Douglas Rumble, Ph.D., *Assistant Professor of Geology.*  
 J. William Schopf, Ph.D., *Assistant Professor of Geology.*



- Ted L. Bear, A.B., *Lecturer in Petroleum Geology.*  
 \*\* David T. Griggs, M.A., *Professor of Geophysics.*  
 Mason L. Hill, Ph.D., *Research Associate in Geology.*  
 \*\* Willard F. Libby, Ph.D., *Professor of Chemistry.*  
 Paul M. Merifield, Ph.D., *Lecturer in Engineering Geology.*  
 Everett C. Olson, Ph.D., *Professor of Zoology.*  
 Louella R. Saul, M.A., *Senior Museum Scientist.*  
 Alexander Stoyanow, Ph.D., *Research Associate in Geology.*  
 Takeo Susuki, M.A., *Senior Museum Scientist.*  
 Peter P. Vaughn, Ph.D., *Professor of Zoology.*  
 \*\* John Wasson, Ph.D., *Associate Professor of Chemistry and Geophysics.*

The program described below is designed to provide the student majoring in earth sciences with as broad and generalized a training as possible in a curriculum leading to the Bachelor of Science degree.

Students majoring in geology must confer with a departmental adviser at or before the beginning of each quarter. Sample undergraduate programs are available in the departmental office.

#### Preparation for the Major

Geology 1, 2; fifteen courses in physical, mathematical, and life sciences (other than geology), of which the following are required: Physics 7A-7B (7C and/or 7D strongly recommended); Chemistry 1A-1B-1C; Mathematics 11A-11B-11C; Biology 1A-1B.

† Absent on leave, 1970-1971.

\*\* Member of the Institute of Geophysics and Planetary Physics.

#### The Major

Geology 101A-101B-101C, 111A-111B-111C, 115, 121A-121B, 190.

Students planning to do graduate work in specialized careers in geology should aim to take, when possible, appropriate courses in departments outside the major department. Suggested graduate programs for various fields of emphasis are available in the departmental office and will provide guidelines in choosing upper division courses.

Qualified undergraduate students may, upon consent of their adviser and the instructor, take Geology graduate courses numbered from 200 to 250.

#### Graduate Study

Students must have a B.S. or B.A. degree in any subject. All entering graduate students are required to take the *General Preliminary*

**Examination** early in the Fall Quarter of their first year of residence. This examination is general in scope, is based upon undergraduate courses only, and is used only for guidance. It has no bearing on admission to graduate status.

### Master of Science Degree

**General University requirements.** See pages 153-154.

**Departmental requirements.** The basic requirement is the completion of a minimum of nine upper division and graduate courses from any physical and/or life science department, of which at least six courses must be at the graduate level, subject to approval by a guidance committee. Of the six graduate level courses, at least one must be a seminar.

No more than two 500-series courses may be applied to the Divisional nine-course minimum and five-graduate-course minimum for the master's degree.

The Thesis Plan is required for those students for whom the M.S. degree is terminal. For those students proceeding to the Ph.D. degree, the Comprehensive Examination Plan is recommended.

Students with differing degree objectives (i.e., physical geology, geophysics, mineralogy, petrology, geochemistry, engineering geology, sedimentology-stratigraphy, paleontology, mineral deposits) will be expected to take appropriate courses in departments outside the major.

### Doctor of Philosophy Degree

**General University requirements.** See page 156.

Students may proceed directly from the B.A. or B.S. degree toward the Ph.D. degree without receiving the M.S. degree. There is no fixed number of courses required for the Ph.D. degree. It is awarded primarily on the ability to do original research and on an understanding of the science as demonstrated by the completion of a dissertation and passing a series of examinations.

As the specific requirements for the degree will depend upon a student's area of interest and prior training, individual programs will be designed in consultation with a guidance committee. It is expected that the student will satisfy the minimum formal course program for the M.S. degree and a further program of intensive study and research, including where appropriate, courses from physical and/or life science departments outside the major.

In addition to the General Preliminary Ex-

amination, the required examinations include: a departmental written and oral examination including the area of specialization of the candidate; an Oral Qualifying Examination; and the Defense of Dissertation.

The foreign language requirement may be satisfied by either: (1) an excellent reading knowledge of one modern foreign language, most commonly German, Russian or French; or (2) a reading knowledge of two modern foreign languages with the possibility of substituting a minor program for one of these.

#### Lower Division Courses

##### 1. Fundamentals of Earth Science.

(Same as Physical Science. 3G.) Lecture, three hours; laboratory, 2 hours. Prerequisite: none. Elements of earth science; study of earth materials; the nature and interpretation of geologic evidence; study of geologic processes; historical aspects of geology.

The Staff

##### 2. Earth History.

(Formerly numbered 4.) Discussion, three hours; laboratory and field work, three hours. Prerequisite: Geology 1 or Physical Sciences 3G. Methods of historical science; consideration of special problems relating to the physical and biological evolution of the earth from earliest time to the present. Stresses maximal individual participation and independent problem solving by students enrolled.

The Staff

#### Upper Division Courses

##### 101A-101B-101C. Mineralogy-Petrology.

Lecture, three to four hours; laboratory, five to six hours. Prerequisites: Geology 1; Physics 7A, 7B (recommended 7D); Chemistry 1A-1B-1C; Mathematics 11A-11B-11C. Integrated study of descriptive and determinative mineralogy, crystal chemistry, optical mineralogy and petrology, including petrography.

The Staff

##### 103. Intermediate Petrology.

Lecture, two hours; laboratory, six hours. Prerequisite: course 101C. Microscopic and megascopic study of selected suites of igneous, sedimentary, and metamorphic rocks; their composition, occurrence, and origin.

The Staff

##### 111A-111B-111C. Structural-Stratigraphic-Field Geology.

Lecture, three to four hours; laboratory, three hours; one day a week field trips. Prerequisite: course 4, or consent of instructor; recommended, course 101A-101B-101C taken prior or concurrently. Principles of geologic mapping, structural geology, stratigraphy, interpretation of geologic maps, graphic solution of structural problems.

The Staff

##### 112. Intermediate Structural Geology.

Lecture, two hours; laboratory, three hours; limited field study. Prerequisite: course 111B. Geometric and dynamic interpretation of faults and folds; structures of metamorphic and igneous rocks; large scale tectonics.

Mr. Christie, Mr. Oertel

##### 115. Principles of Paleontology.

Lecture, three hours; demonstration, one hour; or laboratory, three hours (geology majors must take laboratory); field trips. Prerequisites: none. Principles

governing the evolution and distribution of fossils; the geologic history of plants, invertebrates and vertebrates. Mr. Hall, Mr. Lane, Mr. Schopf

### 118. Paleobotany.

(Formerly numbered 218.) Lecture, three hours; laboratory, three hours. Prerequisites: one course in biological science or consent of instructor. Recommended: course 2 or equivalent. Survey of morphology, paleobiology, and evolution of vascular and non-vascular plants during geologic time, with particular emphasis on major evolutionary events.

Mr. Schopf

### 121A. Advanced Field Geology. (2 courses)

Summer, all day, eight weeks. Prerequisite: course 111C or consent of instructor; course 121B must be taken concurrently. Problems in field geology; preparation of geologic maps and structure sections of selected areas.

The Staff

### 121B. Advanced Geologic Report Writing.

Summer, eight weeks. Prerequisite: must be taken concurrently with course 121A. Preparation of geologic reports in the field and a final summary report on region mapped in course 121A.

The Staff

### 128. Mineral Deposits.

(Formerly numbered 228.) Lecture, three hours; laboratory, three hours. Prerequisite: course 101C. Origin and occurrence of important metallic and non-metallic deposits. (Alternates yearly with course 138.)

Mr. Carlisle, Mr. Watson

### \*130. Isotope Geochemistry.

(Same as Geophysics 130.) Lecture, three hours; discussion, one hour. Prerequisites: junior or senior standing in physical or biological science and consent of instructor. Theoretical aspects of geochronology, particularly Carbon-14 dating. Applications of radioisotopes to the hydrologic cycle and to atmospheric circulation. Stable isotope distribution in nature. Exchange mechanisms and their applications to paleotemperatures, hydrology, mineral formation and origin of biological deposits. (Alternates yearly with course 131.)

Mr. Kaplan, Mr. Libby

### 131. Geochemistry.

(Same as Geophysics 131.) Lecture, three hours; discussion, one hour. Prerequisite: junior or senior standing in chemistry, physics, or geology, or consent of instructor. Origin and abundance of the elements and their isotopes; distribution and chemistry of the elements in the earth, oceans, and atmosphere; chemistry of the earth's interior, phase transformations at high pressure and temperature. (Alternates yearly with course 130.)

Mr. Kennedy, Mr. Wasson, Mr. Wetherill

### 133. Regional Geology.

(Formerly numbered 246.) Lecture, three hours; discussion, two hours. Prerequisite: course 111C or consent of the instructor. Application of geologic, stratigraphic, paleontologic, biologic, and climatic principles to a specific province or provinces. Emphasis on tectonic evolution of selected regions.

Mr. Ernst, Mr. Nelson, Mr. Rosenfeld

### 136. Geophysical Exploration.

(Same as Geophysics 136.) Lecture, three hours. Prerequisite: consent of instructor. Principles and techniques of gravimetric, seismic, magnetic, and other geophysical methods of exploration for ores, petroleum, and other economic minerals. The Staff

### 137. Petroleum and Ground-Water Geology.

(Formerly numbered 132.) Lecture, two and a half hours. Prerequisite: course 111C, or consent of the instructor. Geology applied to exploration for and production of natural gas, petroleum, and water; techniques of surface and subsurface geology; problems of petroleum and ground-water geology.

Mr. Bear

### 138. Mining and Exploration Geology.

Lecture, three hours; field trips. Prerequisite: course 101C. Geological principles applied to the exploration for and evaluation of mineral deposits; geological techniques at operating mines; mine economics; exploration geology and mineral resource economics. (Alternates yearly with course 128.)

Mr. Carlisle, Mr. Watson

### 139. Engineering Geology.

Lecture, two and a half hours. Prerequisite: course 111C, or consent of instructor. Principles and practice of soil mechanics and foundation engineering in light of geologic conditions; recognition, prediction, and control or abatement of subsidence, landslides, earthquakes and other geologic hazards.

Mr. Merifield

### 144. Marine Geology.

(Formerly numbered 244.) Lecture, three hours; laboratory, six hours; field trips. Prerequisite: senior standing. Recent marine sedimentology, and geochemistry; oceanography; morphology, structure and geologic history of the ocean basins.

Mr. Kaplan

### \*150. Problems in Earth History.

Discussion, three hours. Prerequisite: open to upper division and graduate students with permission of instructor; science background advised but not required. Current and classic problems in the history of the earth from its origin to the present. Selected aspects of the evolution of biosphere, atmosphere, chemosphere, and lithosphere. Term paper required.

### 190. Geology Seminar.

Discussion and lecture, 2 hours. Prerequisite: Junior or senior standing. Limited to undergraduate students. Current topics of geologic research.

The Staff

### 199. Special Studies in Geology. (½ to 1 course)

Students may be allowed to take course more than once for credit.

The Staff

#### Graduate Courses

### 200. Geology Colloquium.

Lecture, one to two hours. Reading and discussion in the frontiers of earth science. Graduate students are expected to enroll each year in one of three emphases: (1) mineralogy-petrology-geochemistry; (2) paleontology-sedimentology-oceanography; or (3) tectonics-structural geology-physical geology.

The Staff

### 210. Advanced Paleontology.

Lecture, two hours; laboratory, six hours; field trips. Prerequisite: course 115 or advanced standing in biological science. The detailed study of selected groups of fossils, including emphasis on evolution, classification, paleoecology, and stratigraphic utility.

Mr. Hall, Mr. Lane

\* Not to be given, 1970-1971.



**212. Paleocology.**

Lecture, two hours; laboratory, six hours; field trips. Prerequisites: course 115 and 111C or graduate standing in biological science. How and where animals and plants lived in the past; study of habits and habitats of animals, changes in habits and habitats, and the distribution of animals through time and space. Mr. Hall

**214. Vertebrate Paleontology.**

(Same as Zoology 214.) Lecture, three hours; laboratory, three hours. Prerequisites: Zoology 101 and consent of the instructor; recommended, one course in general geology; limited enrollment. Study of the fossil record of the evolution of the vertebrates. Mr. Vaughn

**215. Paleobiology of Plant Microorganisms.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 115 or advanced standing in biological science. Survey of morphology, evolution and diversification, environmental interactions, and stratigraphic value of bacteria, algae and fungi, with emphasis on dinoflagellates and acritarchs, chrysomonads, silicoflagellates, ebridians and diatoms, discoasters and colliolithophorids. (Alternates yearly with course 216.) Mrs. Loeblich

**\*216. Micropaleontology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 115 or advanced standing in biological science. Survey of microfossils of the animal kingdom, their systematics, morphology, ecology, evolutionary history and stratigraphic use, with emphasis on foraminiferans, radiolarians, chitinozoans, tintinnids, ostracods, scolecodonts and conodonts. (Alternates yearly with course 215.) Mrs. Loeblich

**220. Principles of Paleobiology.**

Lecture and discussion, three hours; laboratory, field or library research leading to a term paper. Prerequisite: graduate standing in science; qualified undergraduates in biological and physical sciences admitted with consent of instructor. Current and classic problems in paleobiology, with emphasis on interdisciplinary problems involving aspects of biology, geology, organic geochemistry and cosmology. Course content to vary from year to year. Mr. Schopf

**225. Theoretical Geomorphology.**

Lecture, three hours. Prerequisites: two years of calculus, one course in elementary probability and statistics, one year of physics, or consent of instructor; recommended, Geography 112 or equivalent. Mechanistic versus stochastic theories; difficulties peculiar to geomorphology; current work on channel networks and drainage basins, on slopes and soil creep, and on river channel geometry and patterns; potential applications. (Offered every third year.) Mr. Shreve

**230. X-Ray Crystallography.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 101C. Point, translation, and space group symmetry, diffraction of x-rays, reciprocal lattice theory, single crystal x-ray methods, diffraction symmetry and elementary crystal structure analysis. (Alternates yearly with course 231.) Mr. Dollase

**\*231. Crystal Chemistry and Structure of Minerals.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 101C. Bonding, interatomic configurations, polymorphic transformations, isotypism,

thermal and positional disorder; survey of the structures of the common minerals, and relation of physical and chemical properties to crystal structure. (Alternates yearly with course 230.) Mr. Dollase

**234. Phase Equilibria.**

Lecture, three hours; discussion, two hours. Prerequisites: course 101C, Chemistry 119C or consent of instructor. Principles governing homogeneous and heterogeneous equilibria, with selected applications to mineral stability relations in igneous and metamorphic rocks (fractional crystallization, partial melting, hydrothermal solutions, element partitioning in coexisting phases). Mr. Ernst

**\*236A. Igneous Petrology.**

Lecture, two hours; laboratory, six hours. Prerequisites: course 234 (may be taken concurrently) and a knowledge of differential equations. Solutions of the heat flow equation for specific examples of cooling magmatic bodies; the nature and origin of batholiths and associated rocks. (Alternates yearly with course 236B). The Staff

**236B. Igneous Petrology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 234 or consent of instructor. Occurrence and origin of mafic and ultramafic rocks. (Alternates yearly with course 236A.) Mr. Watson

**238. Metamorphic Petrology.**

Lecture, three hours; laboratory, six hours. Prerequisite: course 103 or consent of the instructor. Interpretation of metamorphic rocks in the light of observation, theory, and experiment. Geological relations, petrographic evidence, metamorphic zoning, thermodynamics of phase equilibria, projections, chemographic relationships, use of piezobirefringent haloes, Rayleigh depletion model, isotopic fractionation, environmental factors of metamorphism. Laboratory study of representative metamorphic rocks and suites of rocks selected to illustrate topics discussed in lectures. Mr. Rosenfeld

**\*239. Structural Petrology of Deformed Rocks.**

Lecture and discussion, three hours; laboratory, three hours. Prerequisite: courses 101, 111; 112 or 248 recommended, or consent of instructor. Use of universal stage. Microscopic study of textures, structures and preferred orientations of minerals in tectonites. Deformation mechanisms in crystals and aggregates. Theories of development of preferred orientation. Application of experimental data to the interpretation of microfabrics. (Alternates yearly with course 249.) Mr. Christie

**240. Sedimentology.**

Lecture, two hours; laboratory, six hours. Prerequisite: consent of instructor. Characteristics of sediment particles (size, sorting, and morphology) and sedimentary masses and appropriate statistical approaches; relation of these characteristics to the environment and process of deposition. (Alternates yearly with course 241.) Mr. Curtis

**\*241. Sedimentary Petrology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 101C, recommended course 240. Texture, composition, structure, and modes of origin of the sedimentary rocks. (Alternates yearly with course 240.) The Staff

\* Not to be given, 1970-1971.

**\*242. Clay Mineralogy.**

Lecture, two hours; laboratory, six hours. Prerequisite: consent of instructor. Crystallography, chemistry, physical properties, occurrence, origin, and alterations of the clay and related minerals; theory and techniques of identification, characterization, and quantitative analysis using x-ray diffraction and electron microscopy; cation exchange and size characteristics of clay minerals. (Offered in alternate years.) The Staff

**246A-246B. Stress and Deformation.**

(Formerly numbered 250.) Lecture, three hours. Prerequisites: Physics 7A, 7C, Mathematics 12A, 12B, 12C, or consent of instructor. Scalars, vectors, tensors; subscript notation; rotation and inversion of axes, transformation matrix; stress; finite homogeneous strain; rotation; infinitesimal strain, strain rate; Mohr's circle construction and other graphical methods; flow laws. (Offered every third year.) Mr. Shreve

**247. Glaciology.**

Lecture, three hours. Prerequisites: course 246A or similar course, or consent of instructor. Occurrence and classification of glaciers; accumulation and ablation; glacier budget; mechanical properties of ice; glacier flow; crevasses; textural and structural features; thermal relationships; bed slip; climatic response; catastrophic advances. (Offered every third year.) Mr. Shreve

**248. Advanced Structural Geology.**

Lecture, three hours; discussion, two hours. Prerequisite: course 111C. Principles governing fracture, folding, and flow of rocks; solution of structural problems at various scales; regional tectonic problems. Mr. Christie, Mr. Oertel

**249. Structural Analysis of Deformed Rocks.**

Lecture and discussion, three hours; laboratory, three hours. Prerequisites: courses 111; 112 or 248 recommended, or consent of instructor. Geometrical analysis of megascopic structures in terranes with complex or multiple deformations. Analysis of strain from deformed primary features. Interpretation of structural history in metamorphic terranes. (Alternates yearly with course 239.) Mr. Christie, Mr. Oertel

**Graduate Seminars**

All seminars and Geology 297, 298, 596, 597, 598, 599 are to be arranged, all require consent of instructor. Seminars vary in content and instructor according to interests of staff and students. The range of subject matter is indicated by the descriptions following each of the seminar headings. In some, two or more staff members offer a cooperative seminar or sequence of seminars. Students are allowed to take a specifically numbered seminar as often as desired because of changing course content.

**251. Seminar in Mineralogy.**

Examination of groups of rock-forming minerals (e.g., feldspars) integrating such aspects as crystal

structure, crystal chemistry, phase equilibria, and petrogenesis. The Staff

**252. Seminar in Geochemistry.**

Phase equilibria under crustal conditions, chemistry of ocean waters, recent and ancient sediments, structure and chemistry of the upper mantle, geochronology, cosmochronology, and cosmochemistry. The Staff

**253. Seminar in Petrology.**

Problems of igneous or metamorphic petrology; methods of evaluating physical conditions of metamorphism; diffusion in mineralogic systems; origin of ultramafic rocks and problems of the mantle; element fractionation among coexisting phases; other current subjects in the field. The Staff

**254. Seminar in Sedimentology.**

Processes of sediment transport and deposition; deep sea sediments; deltas and estuaries; petrology of carbonates, sandstones, and lutites; stratigraphy; paleo-environmental studies. The Staff

**255. Seminar in Structural Geology and Tectonics.**

Flow and fracture in the earth's crust from microscopic to continental scale and in experiments. Examples may include metamorphic terranes, glaciers, plutons, volcanoes, and consolidated or unconsolidated sediments. Modern concepts of the oceanic basins; processes leading to segregation of continental-type rocks. The Staff

**256. Seminar in Glaciology and Geomorphology.**

Lecture, three hours. Glacier physics, theoretical geomorphology, river mechanics, statistical models. Mr. Shreve

**257. Seminar in Paleontology.**

Current biogeologic literature and research on: evolution of selected groups of animals and plants, numerical taxonomy, organism-environmental relationships, origin and development of life, biostratigraphy, paleoecology, biogeography, and biostatistics. The Staff

**258. Seminar in Mineral Deposits.**

Problems of distribution, composition, and formation of mineral deposits; mineral economics; investigations of opaque minerals by microscopic or other techniques. The Staff

**297. Advanced Techniques in Geological Research.****298. Advanced Topics in Geology. (½ to 1 course)**

Mr. Rubey

Individual Study and Research

**596. Directed Individual Study and/or Research.**

(½ to 2 courses)

The Staff

**597. Preparation for Master's Comprehensive Examination or Doctoral Qualifying Examination. (½ to 2 courses)**

The Staff

**598. Master's Research and Thesis Preparation.**

(½ to 2 courses)

The Staff

**599. Doctoral Research and Dissertation Preparation. (½ to 2 courses)**

The Staff

\* Not to be given, 1970-1971.

## Related Courses in Other Departments

- Geophysics and Planetary Physics 249. Experimental Petrology.  
250. Seminar in Geophysics.  
260. Experimental Geology.

- Planetary and Space Science 222. Introduction to Seismology.  
225A-225B. Physics and Chemistry of Planetary Interiors.  
Zoology 260. Seminar in Vertebrate Paleontology.

## ■ GEOPHYSICS AND PLANETARY PHYSICS

(Institute Office, 3687 Geology Building)

- W. Gary Ernst, Ph.D., *Professor of Geology and Geophysics.*  
David T. Griggs, M.A., *Professor of Geophysics.*  
Robert E. Holzer, Ph.D., *Professor of Geophysics.*  
Isaac R. Kaplan, Ph.D., *Professor of Geology and Geochemistry.*  
William M. Kaula, M.S., *Professor of Geophysics.*  
George C. Kennedy, Ph.D., *Professor of Geochemistry and Geology.*  
Leon Knopoff, Ph.D., *Professor of Geophysics and Physics.*  
Willard F. Libby, Ph.D., *Professor of Chemistry and Director of the Institute of Geophysics and Planetary Physics.*  
Willem V. R. Malkus, Ph.D., *Professor of Geophysics and Mathematics.*  
Clarence E. Palmer, D.Sc., *Professor of Geophysics.*  
Ronald L. Shreve, Ph.D., *Professor of Geology and Geophysics.*  
George W. Wetherill, Ph.D., *Professor of Geophysics, Geology and Planetary Physics.*  
Jacob A. B. Bjerknes, Ph.D., *Emeritus Professor of Meteorology and Geophysics.*  
William W. Rubey, D.Sc., *Emeritus Professor of Geology and Geophysics.*  
§Louis B. Slichter, Ph.D., *Emeritus Professor of Geophysics.*  
Victor Barcion, Ph.D., *Associate Professor of Mathematics and Geophysics.*  
C. Rainer Berger, Ph.D., *Associate Professor of History and Geophysics.*  
Paul J. Coleman, Jr., Ph.D., *Associate Professor of Planetary Physics.*  
John T. Wasson, Ph.D., *Associate Professor of Chemistry and Geophysics.*  
D. D. Jackson, Ph.D., *Assistant Professor of Planetary Physics in Residence.*  
R. L. McPherron, Ph.D., *Assistant Professor of Planetary Physics and Geophysics.*

The Institute of Geophysics and Planetary Physics was established to encourage fundamental research in geophysics, geochemistry and space physics and to provide graduate instruction for qualified students. Members of the staff and associated departments are prepared to supervise graduate work in a variety of fields: atmospheric physics, physics of the radiation belts, interplanetary physics and solar physics, geophysical fluid dynamics, high pressure physics, tectonophysics, geochemistry, nuclear geophysics, age determination, gravitation, physical oceanography and marine geophysics, seismology, physics of the deep interior, and exploration geophysics. The bachelor's degree may be in

any field; however, a thorough undergraduate preparation in one or more of the basic sciences, physics, mathematics or chemistry is expected of students pursuing graduate research. The student who elects to pursue research in geophysics, geochemistry or space physics may do so by entering the Geochemistry Interdepartmental Curriculum or by enrolling in one of the following departments: geology, physics, meteorology, mathematics, astronomy, chemistry, planetary and space science. An individual program of instruction will be worked out for each student, since the requirements for the M.S. or Ph.D. degree are not the same for all students. For

§ Recalled to active service, 1970-1971.

Further information, contact the Institute of Geophysics and Planetary Physics.

### Undergraduate Study

Undergraduate students with an interest in graduate study in Geophysics are advised to complete a major in physics, mathematics or chemistry. Attention is also drawn to opportunities to complete an undergraduate course of studies in Exploration Geophysics or Earth Physics. The catalog listing for this program is to be found on page 74.

#### Upper Division Courses

### 130. Isotope Geochemistry.

(Same as Geology 130.) Lecture, three hours; discussion, one hour. Prerequisites: upper division standing in physical or biological sciences and consent of instructor. Theoretical aspects of geochronology, particularly Carbon-14 dating. Application of radioisotopes to the hydrologic cycle and to atmospheric circulation. Stable isotope distribution in nature. Exchange mechanisms and their applications to paleotemperatures, hydrology, mineral formation and origin of biological deposits. (Alternates yearly with course 131.) Mr. Kaplan, Mr. Libby

### 131. Geochemistry.

(Same as Geology 131.) Lecture, three hours; discussion, one hour. Prerequisite: upper division standing in chemistry, physics, or geology, or consent of instructor. Origin and abundance of the elements and their isotopes; distribution and chemistry of the elements in the earth, oceans, and atmosphere; chemistry of the earth's interior; phase transformations at high pressure and temperature. (Alternates yearly with course 130.) Mr. Kennedy, Mr. Wetherill

### 136. Geophysical Exploration.

(Same as Geology 136.) Lecture, three hours. Prerequisite: consent of the instructor. Principles and techniques of gravimetric, seismic, magnetic, and other geophysical methods of exploration for ores, petroleum, and other economic minerals.

#### Graduate Courses

### 241. Statistical Hydrodynamics.

(Same as Planetary and Space Science 218.) An introduction to the nonlinear fluid processes of planetary physics: aperiodic motion and statistical stability; similarity theory; upper bounds for the turbulent transport of heat and momentum; mean field equations; quantitative theories of turbulent flow; the problem of statistical closure. Mr. Malkus

### 249. Experimental Petrology.

Prerequisite: consent of the instructor.

Mr. Kennedy

### 250. Seminar in Geophysics.

Prerequisite: consent of the instructor. Seismology, geophysical prospecting, electromagnetic prospecting. Selected topics in earth physics. The content will vary from year to year.

### 260. Experimental Geology. (¼ to 1½ courses)

Seminar, two hours; laboratory, optional. Prerequisite: consent of the instructor. The mechanics of rock deformation. Dimensional analysis and model theory applied to geological problems. Mr. Griggs

#### Individual Study and Research

### 596. Directed Individual Study or Research in Geophysics. (¼ to 1½ courses)

This course will include studies relative to exploration geophysics and experimental work in the electromagnetic model laboratory; research relative to gravity-surveying and to gravity earthtides; theoretical and experimental studies relative to seismology and geophysics (Mr. Knopoff); tectonophysics and properties of matter at high pressure (Mr. Griggs); atmospheric electrical phenomena (Mr. Holzer); meteorological problems (Mr. Palmer); radioactive dating and nuclear geophysics (Mr. Libby, Mr. Wetherill); hydrodynamics (Mr. Malkus); meteorites (Mr. Wetherill); volcanology, physics of high pressure, phase equilibria in geologically important chemical systems (Mr. Kennedy); geodesy and satellite orbit analysis (Mr. Kaula). The Staff

### 596A. Directed Individual Study or Research in Geochemistry. (¼ to 1½ courses)

Prerequisite: consent of the instructor. Nuclear geochemistry, geochronology, isotope chemistry of meteorites (Mr. Wetherill); cosmochemistry, trace element abundances in meteorites, natural radioactivity (Mr. Wasson); radiocarbon dating, tritium hydrology and water and moisture circulation, radioactive fallout circulation and precipitation and assimilation into the biosphere, high pressure chemistry particularly as applied to planetary interiors, chemistry of ionizing radiation particularly as applied to planetary atmospheres (Mr. Libby); experimental investigation of phase equilibrium at high temperatures and pressures with emphasis on geochemically important systems (Mr. Kennedy); experimental and theoretical investigation of phase equilibrium relations involving crustal conditions (Mr. Ernst); sedimentary geochemistry, geochemistry of stable isotopes, geological microbiology, origin and diagenesis of marine and nonmarine sediments, chemical history of the oceans, organic compounds in meteorites and biochemistry of early evolutionary processes (Mr. Kiplan). The Staff

### 597A. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (¼ to 1½ courses)

For course content and staff see course 596.

### 597B. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. in Geochemistry. (¼ to 1½ courses)

For course content and staff see course 596A.

### 598. Research for and Preparation of the Master's Thesis in Geochemistry. (¼ to 1½ courses)

For course content and staff see course 596A.

### 599A. Research for and Preparation of the Doctoral Dissertation. (¼ to 1½ courses)

For course content and staff see course 596.

### 599B. Research for and Preparation of the Doctoral Dissertation in Geochemistry. (¼ to 1½ courses)

For course content and staff see course 596A.

## ■ GERMANIC LANGUAGES

(Department Office, 310 Royce Hall)

- Franz H. Bäuml, Ph.D., *Professor of German (Chairman of the Department)*.  
 Carl William Hagge, Ph.D., *Professor of German*.  
 Wayland D. Hand, Ph.D., *Professor of German and Folklore*.  
 Victor A. Oswald, Jr., Ph.D., *Professor of German*.  
 Eli Sobel, Ph.D., *Professor of German*.  
 Erik Wahlgren, Ph.D., *Professor of Scandinavian Languages*.  
 Gustave Otto Arlt, Ph.D., LL.D., *Emeritus Professor of German*.  
 Alfred Karl Dolch, Ph.D., *Emeritus Professor of German*.  
 Kenneth G. Chapman, Ph.D., *Associate Professor of Scandinavian Languages (Vice-Chairman, Scandinavian Section)*.  
 Vern W. Robinson, Ph.D., *Associate Professor of German*.  
 †Donald J. Ward, Ph.D., *Associate Professor of German*.  
 William J. Mulloy, Ph.D., *Emeritus Associate Professor of German*.  
 Ehrhard Bahr, Ph.D., *Assistant Professor of German*.  
 Arthur B. Groos, Jr., Ph.D., *Assistant Professor of German*.  
 Alfred Karnein, Ph.D., *Assistant Professor of German*.  
 Wolfgang Nehring, Ph.D., *Assistant Professor of German*.  
 Stephen P. Schwartz, Ph.D., *Assistant Professor of German*.  
 Ross P. Shideler, Ph.D., *Assistant Professor of Scandinavian and Comparative Literature*.  
 Hans Wagener, Ph.D., *Assistant Professor of German*.  
 Terence Harrison Wilbur, Ph.D., *Assistant Professor of German*.  
 Jules Zentner, Ph.D., *Assistant Professor of Scandinavian Languages*.



- E. Bond Johnson, III, M.A., *Acting Assistant Professor of German*.  
 Stephanie Lombardi, Ph.D., *Lecturer in German*.  
 James R. Massengale, M.A., *Acting Assistant Professor of Scandinavian Languages*.  
 David R. McCann, M.A., *Acting Assistant Professor of German*.  
 Horst Schmidt-Brümmer, Ph.D., *Acting Assistant Professor of German*.  
 ———, *Associate in German*.

### Preparation for the Major in German

Required: courses 1, 2, 3, 4, 5, 6, or their equivalents.

### The Major in German

Two majors of 15 courses each are offered by the department. Either one may be used in satisfaction of Bachelor of Arts requirements.

Plan A is designed primarily for the undergraduate who may expect to continue study toward the attainment of a teaching credential and/or a terminal M.A. degree. This plan requires courses 100, 103A, 103B, 108A, 108B, 117, 123A, 123B, 128, 129 and two introductory literature courses chosen from 104, 105, 106, 107, and three courses to be

chosen from among 122, 124, 125, 126, 127, 132, 134.

Plan B is designed primarily for the undergraduate who may expect to continue study toward the attainment of the M.A. in German and the Ph.D. degree in Germanic Languages. This plan requires courses 100, 101, 108A, 108B, 117; five introductory literature courses: free choice among 103A, 103B, 104, 105, 106, 107; and five advanced courses: free choice among 122, 123A, 123B, 124, 125, 126, 127, 128, 129, 132, 134.

### Admission to Graduate Status

The completion of the undergraduate major, or its equivalent, with a minimum grade-point average of 3.0 is required. If the candidate is deficient in the undergraduate major he must complete it by taking the appropri-

† Absent on leave, 1970-1971.

ate courses, as recommended by the departmental graduate adviser. A placement examination in German language and literature may be required of entering graduate students.

#### **Requirements for the Standard Secondary Credential**

Consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

#### **Requirements for the Master's Degree**

1. For the general requirements, see pages 153-154.

2. Application for advancement to candidacy may be made when the student has passed the Graduate Division reading examination in French.

3. A minimum of nine upper division and graduate level courses of which at least five courses must be graduate level (200 or 500 series), plus a comprehensive examination and additional course requirements described under items 5 and 6 below. When appropriate, the comprehensive examination will be conducted orally.

4. A student who is accepted by the Department on the thesis plan is required to pass an oral examination in the field of the thesis (as provided on page 155), in addition to the comprehensive examination of item 5 (Plan A) below.

5. For the candidate who expects to terminate his studies with an M.A. degree and teaching credential (Plan A): in addition to the minimum of nine upper division and graduate courses mentioned above in item 3, courses 128 and 129 (or their equivalent) and 370 are specifically required. No seminar is required. A comprehensive examination is required on (a) the origin and development of the standard German language, (b) contemporary standards of the German language, and (c) major works and authors from earliest times to the present.

6. For the candidate whose interests are literary and linguistic rather than pedagogical or who intends to proceed toward the Ph.D. (Plan B): at least 9 upper division and graduate courses, of which 6 must be of graduate level; one seminar must be included. A comprehensive examination is required on (a) a basic knowledge of bibliography, (b) a reading knowledge of Middle High German, (c) the origin and development of the German language, and (d) major works and authors from the earliest times to the present.

#### **Requirements for the Doctor's Degree**

1. For the general requirements, see pages 156-160.

2. The department reserves the right to require of a student holding an M.A. degree from another institution an examination equivalent to that given its own M.A. candidates. Failure to demonstrate satisfactory achievement may result in the assignment of additional preparatory courses.

3. Advancement to candidacy will take place when the student has (a) passed the graduate reading examination in French; (b) passed a departmental reading examination either in a modern Scandinavian language or Dutch-Flemish-Afrikaans or in Latin; (c) successfully completed three seminars; (d) passed the qualifying examinations for the doctorate (see item 4 below).

4. At the beginning of his work toward the doctorate or as soon as possible thereafter, the student shall make known his intended major field as well as his minor field, selected from the four fields in which the degree is offered: (a) German Literature, (b) Germanic Philology and Linguistics, (c) Scandinavian Literature and Philology, (d) Germanic Folklore. The field in which the candidate intends to present a dissertation will be designated as his major field. A departmental doctoral guidance committee will direct his work toward the qualifying examinations. The candidate who chooses German Literature as his major field will be required to choose two fields of specialization (which will comprise the subject-matter of his major field examination) from the following: (a) Medieval German Literature; (b) German Literature of the 10th and 17th Centuries; (c) the 18th Century and Classicism; (d) Romanticism and the 19th Century; (e) Modern German Literature. The candidate who chooses German Literature as his minor field will be required to select from the above five fields of specialization one field which will be covered by his minor field examination. The candidate shall pass one written qualifying examination in his major field and one written qualifying examination in a minor field. He is then subject to an oral qualifying examination administered by his doctoral committee, as provided on page 156. Upon passing his qualifying examinations the candidate shall write a dissertation. The final oral examination will deal primarily with the relation of his dissertation to the field of knowledge to which it contributes.

## Lower Division Courses

No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition. Prerequisites for lower division courses are listed under the course descriptions. Students with demonstrated preparation may be permitted a more advanced program by the Department, or such students may be transferred to a more advanced course on recommendation of the instructor.

**1. Elementary German.**

Lecture, five hours per week; laboratory, one hour. Mrs. Lombardi in charge

**1G. Elementary German for Graduate Students.**

(No credit)

Lecture, five hours per week. To provide preparation for Graduate Division foreign language reading requirement. Mrs. Lombardi in charge

**2. Elementary German.**

Lecture, five hours per week; laboratory, one hour. Prerequisite: course 1. Mrs. Lombardi in charge

**2B. Elementary German for Graduate Students.**

(No credit)

Continuation of course 1G. Mrs. Lombardi in charge

**3. Elementary German.**

Lecture, five hours per week. Prerequisite: course 2 or two years of high school German. Mrs. Lombardi in charge

**4. Intermediate German.**

Lecture, five hours per week. Prerequisite: course 3 or three years of high school German. Mrs. Lombardi in charge

**5. Intermediate German.**

Prerequisite: course 4, or four years of high school German. Mrs. Lombardi in charge

**6. Intermediate German.**

Prerequisite: course 5 or the equivalent. Mrs. Lombardi in charge

## Upper Division Courses

The prerequisite for all upper division courses except 121A, 121B, 121C, 121D is course 6 or the equivalent.

## Courses Not Open to Graduate Students in German

**100. German Civilization and Culture.**

A study of the development of German civilization and institutions from the earliest times to the present. Study of German culture as represented in its literature, art, music, and architecture. Mr. Sobel, Mr. Wagener

**101. The Study of German Literature.**

Application of the techniques and methods employed in literary criticism. Study of the various

genres of German literature and of German prosody. Mr. Bahr, Mr. Johnson, Mr. McCann

**103A. Lessing.**

Reading and discussion of representative works of Lessing, including *Minna von Barnhelm*, *Emilia Galotti*, *Nathan der Weise*, *Die Erziehung des Menschengeschlechts*, and selections from *Laocoon* and *Hamburgische Dramaturgie*. Mr. Bahr, Mr. Groos, Mr. Hagge

**103B. Schiller.**

Reading and discussion of representative works of Schiller including *Die Räuber*, *Kabale und Liebe*, *Wallensteins Tod*, *Maria Stuart*, *Die Jungfrau von Orleans*, and *Wilhelm Tell*. Mr. Bahr, Mr. Groos, Mr. Hagge

**104. Introduction to Romanticism.**

Analysis of selected poetry and narrative prose of the Romantic period. Mr. Johnson, Mr. Nehring

**105. Introduction to 19th Century German Literature.**

(Formerly numbered 104.) Analysis of selected works of post-Romantic, pre-Naturalistic literature. Mr. Johnson, Mr. Nehring, Mr. Schmidt-Brümmer

**106. Introduction to Modern Literature.**

(Formerly numbered 105.) Analysis of selected works of the period from 1890 to 1945. Mr. Karnein, Mr. McCann, Mr. Oswald

**107. Introduction to Contemporary Literature.**

Analysis of selected works of the period 1945 to the present time. Mr. Karnein, Mr. McCann

**108A. Advanced Composition, Grammar, and Conversation.**

(Formerly numbered 106A.) Grammar, composition, conversation. Mr. Karnein, Mrs. Lombardi

**108B. Advanced Composition, Grammar, and Conversation.**

(Formerly numbered 106B.) Grammar, composition, conversation. Prerequisite: course 108A or consent of instructor. Mr. Karnein, Mrs. Lombardi

**117. Language and Linguistics.**

Prerequisites: courses 100 and 108A. Introduction to the historical development of the German language; theory and method of descriptive, historical, and comparative linguistics. Mr. Schwartz

**121A. Older German Literature in Translation.**

Analyses in English of works of German literature from the Medieval period to Baroque. Mr. Groos, Mr. Sobel

**121B. Classical German Literature in Translation.**

(Formerly numbered 121A.) Analyses in English of works of the period of Classicism. Mr. Bahr, Mr. Groos, Mr. Robinson

**121C. 19th Century German Literature in Translation.**

Readings and lectures in English on selected 19th century authors. Mr. Robinson

**121D. Modern German Literature in Translation.**

(Formerly numbered 121B.) Readings and lectures in English on selected modern authors.

Mr. McCann, Mr. Oswald

Courses Open to Graduate Students in German

**122. Studies in German Literature before 1750.**

(Formerly numbered 131.) Prerequisites: three upper division courses, including courses 100 and 101 or consent of the instructor. Readings and analysis of major works from the Middle Ages to the Baroque.

Mr. Groos, Mr. Sobel

**123A. The Young Goethe.**

Prerequisites: courses 100, 101 and 103A or 103B, or consent of the instructor. Reading and discussion of representative works of Goethe's early period including *Götz von Berlichingen*, *Werther*, *Urfaust*, *Egmont*, and a wide selection of lyrics.

Mr. Bahr, Mr. Groos, Mr. Hagge

**123B. The Classical Goethe.**

Prerequisites: courses 100, 101, 104, or 103A or 103B, or consent of the instructor. Reading and discussion of representative works of Goethe's maturity and old age, including *Iphigenie auf Tauris*, *Torquato Tasso*, *Die Wahlverwandtschaften*, *Novelle*, and a wide selection of lyrics.

Mr. Bahr, Mr. Hagge

**124. Advanced Study in Romanticism.**

Prerequisites: courses 100, 101, 104, or consent of the instructor. Reading and analysis of a wider range of works than in course 104.

Mr. Nehring

**125. Advanced Study in Nineteenth Century Literature.**

(Formerly numbered 124.) Prerequisites: courses 100, 101, 105, or consent of the instructor. Reading and analysis of a wider range of works than in 105.

Mr. Nehring, Mr. Robinson, Mr. Schmidt-Brümmer

**126. Advanced Study in Modern Literature.**

(Formerly numbered 125.) Prerequisites: courses 100, 101, 106 or consent of the instructor. Reading and analysis of a wide range of the literature from 1890-1945.

Mr. Johnson, Mr. Oswald

**127. Advanced Study in Contemporary Literature.**

Prerequisites: courses 100, 101, 107 or consent of the instructor. Analysis of a wide range of German literature from 1945 to the present.

Mr. McCann

**128. Advanced Composition, Grammar and Conversation.**

(Formerly numbered 116.) Prerequisites: courses 108A-108B or consent of the instructor. Grammar, composition, conversation.

Mr. Karnein, Mrs. Lombardi

**129. German Phonetics.**

(Formerly numbered 118.) Study of the articulatory basis of the sounds of German and practice in standard pronunciation.

Mr. Wilbur

**132. Goethe's Faust.**

Prerequisites: courses 100, 101, 123A, 123B or consent of the instructor. Detailed interpretation of Goethe's *Faust*, Parts I and II, together with more general consideration of other treatments of the Faust theme in European literature.

Mr. Hagge

**134. German Folklore.**

A survey of the various genres of German folklore.

Mr. Hand, Mr. Ward

**199A-199Z. Special Studies. (½ or 1 course)**

Prerequisites: senior or graduate standing, and consent of the instructor. To be arranged with the member of the faculty who will direct the study. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599-research course. A course of independent study for graduates or senior undergraduates who desire more intensive or specialized investigation of material covered in a regular course, and who present such a course as a prerequisite.

The Staff

**Graduate Courses****201A. Bibliography of German Literary History.**

(Formerly numbered 201.) Study of the various kinds of bibliographies, handbooks, lexica, series publications, journals, literary histories, and other reference works.

Mr. Sobel

**201B. History of Germanistics.**

A history of the study of German literature and the German language from Humanism to the present with particular attention to the development of new methods in philology and literary historiography.

Mr. Bäuml, Mr. Ward

**201C. Theories and Methods of Literary Criticism.**

Foundations of literary criticism, current theories and methods.

Mr. Bahr

**201D. Diplomatics, Palaeography, and Principles of Text Editing.**

A study of diplomatics, medieval German palaeography, and the principles of editing various types of texts.

Mr. Bäuml

**202A. Middle High German.**

(Formerly numbered 202.) Introduction to the Middle High German language.

Mr. Bäuml, Mr. Karnein

**202B. Readings in Middle High German Literature.**

(Formerly numbered 203.) Readings from Middle High German courtly literature.

Mr. Bäuml, Mr. Karnein

**203A. The Courtly Epic.**

Analysis of Hartmann's *Erec* and *Iwein*, Wolfram's *Parzival*, and Gottfried's *Tristan*. Lectures on methods of interpretation.

Mr. Bäuml, Mr. Groos

**203B. The Courtly Lyric.**

Analysis of lyric poetry from Der von Kurenberg to Johannes Hadlaub.

Mr. Bäuml, Mr. Karnein

**203C. The Heroic Epic.**

Analysis and methods of interpretation of heroic poetry from the *Hildebrandslied* to *Kudrun*.

Mr. Bäuml, Mr. Ward

**204A. Early New High German Literature.**

Introduction to the Early New High German language, readings from Early New High German literature.

Mr. Sobel



**204B. Renaissance and Reformation Literature.**

(Formerly numbered 204.) German literature of the 15th and 16th centuries. Mr. Sobel

**205A. Baroque Novel and Prose Satire.**

Development of modern Baroque scholarship and definition of Baroque as literary period. Types of the Baroque novel and prose satire. Mr. Wagener

**205B. Baroque Lyric and Drama.**

Prosodies and lyrics from J. Regnard to J. C. Günther and Baroque drama from Heinrich Julius von Braunschweig to Christian Reuter. Mr. Sobel, Mr. Wagener

**206A. Enlightenment and Sentimentalism.**

Representative authors of the earlier part of the eighteenth century from Gottsched through Lessing. Mr. Bahr, Mr. Hagge

**206B. Sturm und Drang.**

Representative authors of the *Sturm und Drang* including the young Goethe and Schiller. Mr. Bahr, Mr. Groos, Mr. Hagge

**207A. Classicism: Goethe.**

Selected topics in the works of Goethe in the period 1776-1832. Mr. Bahr, Mr. Hagge

**207B. Classicism: Schiller.**

Selected topics in the dramatic and critical works of Schiller in the period 1793-1805. Mr. Bahr, Mr. Groos, Mr. Hagge

**208. Romanticism.**

Analysis of representative works of the Romantic Period. Mr. Nehring

**209A. 19th Century Lyrics.**

Analysis of postromantic lyric poetry. Mr. Bahr, Mr. Nehring

**209B. 19th Century Drama.**

Analyses of postromantic, prenaturalistic dramas. Mr. Nehring

**209C. 19th Century Prose.**

Analyses of works of postromantic, prenaturalistic narrative prose. Mr. Bahr, Mr. Nehring, Mr. Schmidt-Brümmer

**210A. Naturalism and Symbolism.**

Poetry, drama, and shorter narratives of the period 1890-1938. Mr. Oswald

**210B. Expressionism and Neorealism.**

Poetry, drama, and shorter narratives of the period 1910-1948. Mr. Oswald

**210C. 20th Century Novel to 1945.**

Analyses of selected novels written prior to 1945. Mr. Oswald

**211A. Contemporary Novel.**

Analyses of selected novels of the period from 1945 to the present. Mr. Karnein, Mr. McCann

**211B. Contemporary Lyrics and Drama.**

Lyrics and drama of the period from 1945 to the present. Mr. Karnein, Mr. McCann

**217. History of the German Language.** Mr. Schwartz**230. Survey of Germanic Philology.** Mr. Wilbur**231. Gethic.**

Mr. Schwartz, Mr. Wilbur

**232. Old High German.**

Mr. Schwartz

**233. Old Saxon.**

Mr. Wilbur

**240A. Theories, Methods, and History of Germanic Folklore.**

Historical survey of the theories of German folklorists of the nineteenth and twentieth centuries, and a study of contemporary folklore mythology. Mr. Hand, Mr. Ward

**240B. Folk Song and Ballad.**

Survey of German folk song and ballad, as to historical development, relation to other literary genres, ethnic background, and poetic and musical values. Mr. Hand, Mr. Ward

**240C. Oral Prose Genres.**

Legends, folk tales, jests, proverbs, riddles; their history, function, and poetic value. Mr. Hand, Mr. Ward

**245A. Germanic Religions and Mythology.**

(Formerly numbered 245.) (Same as Scandinavian 245). Mr. Wahlgren

**245B. Germanic Antiquities.**

Prehistory and early history of Germanic culture; a philological investigation of Germanic ethnography, customs, behavior and law. Mr. Schwartz

**251. Seminar in Syntax and Phonology of German.**

(Formerly numbered 290.) The syntactical and phonological structure of the German language according to the principles of generative grammar and other techniques. Mr. Schwartz, Mr. Wilbur

**252. Seminar in Historical and Comparative German Linguistics.**

The historical development of the Germanic languages according to the principles and techniques of comparative linguistics. Mr. Schwartz, Mr. Wilbur

**253. Seminar in Medieval Literature.**

Mr. Bäuml, Mr. Groos, Mr. Karnein

**254. Seminar in Renaissance and Reformation.**

Mr. Sobel

**255. Seminar in Baroque Literature.**

Mr. Sobel, Mr. Wagener

**256. Seminar in Enlightenment and Sturm und Drang.**

Mr. Bahr, Mr. Hagge

**257. Seminar in the Age of Goethe.**

Mr. Bahr, Mr. Hagge

**258. Seminar in Romanticism.** Mr. Bahr, Mr. Nehring**259. Seminar in 19th Century Literature.**

Mr. Nehring

**260. Seminar in the Modern Period.**

Mr. Oswald

**261. Seminar in Contemporary Literature.**

Mr. McCann

**262. Seminar in Germanic Folklore.**

Mr. Hand, Mr. Ward

## Professional Course in Method

**370. The Teaching of German.**

Lecture, three hours per week and discussion periods. Prerequisite: graduate standing or consent of the instructor. Required of all candidates for the general secondary credential in German.

Mrs. Lombardi

## Individual Study and Research

**596A-596ZZ. Directed Individual Study or Research.**

To be arranged with the member of the faculty who will direct the study or research. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599 research course. To be graded on Satisfactory-Unsatisfactory basis. May be taken twice. Only one course in the 500 series may count toward the M.A. requirement.

The Staff

**597A-597ZZ. Preparation for Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D.**

To be arranged with the member of the faculty who will direct the study. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599 research course. To be graded on Satisfactory-Unsatisfactory basis. Holders of M.A. degree in German may take it twice. Only one course in the 500 series may count toward the M.A. graduate course requirement.

The Staff

**598A-598ZZ. Research for Preparation of Master's Thesis.**

To be arranged with the member of the faculty who will direct the study. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599 research course. To be graded on Satisfactory-Unsatisfactory basis. May be taken three times. Only one course in the 500 series may count toward the M.A. graduate course requirement.

The Staff

**599A-599ZZ. Research for Preparation of the Doctoral Dissertation. (1 to 2 courses)**

To be graded on Satisfactory-Unsatisfactory basis. May be taken unlimited number of times. To be arranged with the member of the faculty who will direct the study. Each faculty member has his own doctoral research course identified by a two-letter code as follows: E. Bahr, 599EB; F. H. Bäuml, 599FB; A. B. Groos, 599AG; C. W. Hagge, 599CH; W. D. Hand, 599WH; A. Karnein, 599AK; D. R. McCann, 599DM; W. Nehring, 599WN; V. A. Oswald, Jr., 599VO; V. W. Robinson, 599VR; S. P. Schwartz, 599SS; E. Sobel, 599ES; H. Wagener, 599HW; D. J. Ward, 599DW; T. H. Wilbur, 599TW.

**Dutch-Flemish and Afrikaans****101A. Elementary Dutch-Flemish.****101B. Elementary Afrikaans.****101C. Intermediate Readings in Dutch-Flemish and Afrikaans.**

Prerequisite: course 101A or 101B, or consent of the instructor.

**112. Dutch, Flemish, Afrikaans Literature in Translation.**

Readings and analysis of selected works in translation from Dutch, Flemish, and Afrikaans Literature.

**199. Special Studies in Dutch-Flemish and Afrikaans. (½ to 1 course)****Scandinavian Languages****Preparation for the Major**

Plan A. Required: courses 1, 2, 3, 4, 5, 20, or 11, 12, 13, 14, 15, 20, or their equivalents. For Plans B and C, the requirements will include the above and German 1, 2, 3, 4, 5, 6.

**The Major in Scandinavian**

Three majors of 10 courses each are offered. Any one of the 3 may be used in satisfaction of the A.B. requirements.

Plan A is designed primarily for undergraduates who do not contemplate graduate work in this Department. This plan requires: Scandinavian 141, 142, 143, 185, and 6 courses from Scandinavian 105, 106, 144, 145, 151, 152, 153.

Plan B is designed primarily for undergraduates who may wish to pursue graduate work with the emphasis on literature. This plan requires: Scandinavian 141, 142, 143, 185, German 101, 103A, 103B, 105, and 3 courses from the following: Scandinavian 105, 106, 144, 145, 151, 152, 153, German 106, 123A, 123B, 125, 132.

Plan C is designed primarily for undergraduates who may wish to pursue graduate work with emphasis on philology. This plan requires: Scandinavian 141, 142, 143, German 101, 108A, 117, and 3 courses from Scandinavian 105, 106, 151, 152, 153.

**Admission to Graduate Status**

The completion of the undergraduate major, or its equivalent, with a minimum grade-point average of 3.0 is required. If the candidate is deficient in the undergraduate major he must complete it by taking the appropriate courses, as recommended by the adviser of the Scandinavian section. A placement examination in the Scandinavian languages, as well as in German, may be required of entering graduate students.

**Lower Division Courses**

No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in gram-

mar and/or composition. Prerequisites for lower division courses are listed under the course descriptions. Students with demonstrated preparation may be permitted a more advanced program by the Department, or such students may be transferred to a more advanced course on recommendation of the instructor.

**1. Elementary Swedish.** Mr. Zentner in charge

**2. Elementary Swedish.**  
Prerequisite: course 1 or equivalent.  
Mr. Zentner in charge

**3. Elementary Swedish.**  
Prerequisite: course 2 or equivalent.  
Mr. Zentner in charge

**4. Intermediate Swedish.**  
Prerequisite: course 3 or equivalent.  
Mr. Zentner in charge

**5. Intermediate Swedish.**  
Prerequisite: course 4 or equivalent.  
Mr. Zentner in charge

**11. Elementary Norwegian.** Mr. Chapman in charge

**12. Elementary Norwegian.**  
Prerequisite: course 11 or equivalent.  
Mr. Chapman in charge

**13. Elementary Norwegian.**  
Prerequisite: course 12 or equivalent.  
Mr. Chapman in charge

**14. Intermediate Norwegian.**  
Prerequisite: course 13 or equivalent.  
Mr. Chapman in charge

**15. Intermediate Norwegian.**  
Prerequisite: course 14 or equivalent.  
Mr. Chapman in charge

**20. Intermediate Norwegian and Swedish.**  
(Formerly numbered 6 and 16.) Lecture, three hours per week and special assignments. Prerequisites: courses 5, 15, or the equivalent. Readings in Swedish and Norwegian, written and oral exercises.  
Mr. Wahlgren in charge

**21. Elementary Danish.**  
A first quarter-course in the Danish language.  
Mr. Massengale

**22. Elementary Danish.**  
Prerequisite: course 21, or equivalent. A second-quarter course in the Danish language.  
Mr. Massengale

**23. Elementary Danish.**  
Prerequisite: course 22, or equivalent. A third-quarter course in the Danish language.  
Mr. Massengale

#### Upper Division Courses

**105. Advanced Swedish.**  
Lecture, three hours per week and special assignments. Prerequisite: course 20 or equivalent. Readings, composition, and conversation. Conducted in Swedish.  
Mr. Wahlgren in charge

**106. Advanced Swedish.**  
(Formerly numbered 105B.) Lecture, three hours per week with special assignments. Prerequisite:

course 105 or equivalent. Readings, composition, and conversation. Conducted in Swedish.  
Mr. Wahlgren in charge

#### 141. Medieval Scandinavian Literature.

Lecture, three hours per week. Open to all upper division students. Reading in the Old Icelandic sagas, the Eddas, and early ballad literature. Conducted in English, and no knowledge of a Scandinavian language is required.  
The Staff

#### 142. Scandinavian Literature of the 18th and 19th Centuries.

Lecture, three hours per week. Prerequisite for Scandinavian majors: course 20, or equivalent knowledge of Danish. For nonmajors; no knowledge of a Scandinavian language is required.  
Mr. Chapman, Mr. Wahlgren, Mr. Zentner

#### 143. Modern Scandinavian Literature.

Lecture, three hours per week. Prerequisite for Scandinavian majors: course 20, or equivalent knowledge of Danish. For nonmajors: no knowledge of a Scandinavian language is required.  
Mr. Chapman, Mr. Wahlgren, Mr. Zentner

#### 144. Ibsen.

Lecture, three hours per week. Prerequisite for Scandinavian majors: course 20, or equivalent knowledge of Danish. For nonmajors: no knowledge of a Scandinavian language is required.  
Mr. Chapman, Mr. Zentner

#### 145. Strindberg.

Lecture, three hours per week. Prerequisite for Scandinavian majors: course 20, or equivalent knowledge of Danish. For nonmajors: no knowledge of a Scandinavian language is required.  
Mr. Chapman, Mr. Zentner

#### 151. Elementary Old Icelandic.

Lecture, three hours per week, and special assignments. Prerequisite: at least one year of a modern Scandinavian language or consent of the instructor. Grammar and readings of prose literature.  
Mr. Chapman, Mr. Wahlgren

#### 152. Intermediate Old Icelandic.

Lecture, three hours per week, and special assignments. Prerequisite: course 151. Readings of Old Icelandic prose and poetry.  
Mr. Chapman, Mr. Wahlgren

#### 153. Modern Icelandic.

Lecture, three hours per week. Prerequisite: course 152. Grammar, readings, composition, and conversation.  
Mr. Chapman

#### 185. Readings in Scandinavian Literature History.

Reading course in the standard literary histories for Denmark, Iceland, Norway, and Sweden. Readings in English. No lectures; written examinations. Required for the A.B. and of graduate students offering Scandinavian as a minor field for the Ph.D.  
The Staff

#### 190. Honors Course in Scandinavian.

Lecture by special arrangement. Prerequisites: senior standing with a minimum 3.0 grade-point average in the major and consent of the honors committee of the Scandinavian section. Intensive study of a selected special topic in Scandinavian. Discussions, oral and written reports.  
The Staff

**199A-199Z. Special Studies in Scandinavian.**

(½ or 1 course)

Prerequisites: senior or graduate standing, and consent of the instructor. To be arranged with the member of the faculty who will direct the study. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599 research course. A course of independent study designed for graduates or senior undergraduates who desire more intensive or specialized investigation of material covered in a regular course, and who present such a course as a prerequisite.

**Graduate Courses****211. Typology of the Scandinavian Languages.**

Lecture, three hours per week. Prerequisites: graduate standing, a thorough knowledge of one or more Scandinavian languages, and a reading knowledge of German. Icelandic is strongly recommended.

Mr. Chapman

**212. History of the Scandinavian Languages.**

Lecture, three hours per week. Prerequisite: course 211. A knowledge of Icelandic is strongly recommended.

Mr. Chapman, Mr. Wahlgren

**221. Advanced Old Icelandic (Prose).**

Readings in advanced literary texts in Old Icelandic. Prerequisite: Course 152 or equivalent.

Mr. Chapman, Mr. Wahlgren

**222. Advanced Old Icelandic (Poetry).**

Readings in advanced poetic texts, Eddic and Skaldic. Prerequisite: Course 221 or equivalent.

Mr. Chapman, Mr. Wahlgren

**245. Scandinavian Mythology.**

(Same as German 245A.) Lecture, three hours per

week. Prerequisite: Knowledge of German, a Scandinavian language, or consent of the instructor.

Mr. Wahlgren

**251. Ibsen.**

Intensive study of the works of Henrik Ibsen. Prerequisite: Course 144 and an advanced knowledge of Norwegian. Mr. Massengale, Mr. Zentner

**252. Strindberg.**

Intensive study of the work of August Strindberg. Prerequisite: Course 145 and an advanced knowledge of Swedish. Mr. Massengale, Mr. Zentner

**263. Seminar in Scandinavian Studies.**

Mr. Chapman, Mr. Wahlgren, Mr. Zentner  
Individual Study and Research

**596A-596Z. Directed Individual Study or Research.**

To be arranged with the member of the faculty who will direct the study or research. The member of the faculty directing the study will be identified by the same two-letter code used to identify his 599 research course. To be graded on Satisfactory-Unsatisfactory basis. May be taken twice. Only one course in the 500 series may count toward the M.A. graduate course requirement.

**599A-599Z. Research for Preparation of the Doctoral Dissertation.**

To be graded on Satisfactory-Unsatisfactory basis. May be taken unlimited number of times. To be arranged with the member of the faculty who will direct the study. Each faculty member has his own doctoral research course identified by a two-letter code as follows: K. G. Chapman, 599KC; R. P. Shideler, 599RS; E. Wahlgren, 599EW; J. Zentner, 599JZ.

**■ HISTORY**

(Department Office, 6265 Bunche Hall)

Milton Anastos, Ph.D., *Professor of Byzantine Greek and History.*Amin Banani, Ph.D., *Professor of Persian and History.*Truesdell S. Brown, Ph.D., *Professor of History.*Robert N. Burr, Ph.D., *Professor of History.*Mortimer H. Chambers, Jr., Ph.D., *Professor of History.*Stanley Coben, Ph.D., *Professor of History.*John S. Galbraith, Ph.D., *Professor of History.*Gustave E. von Grunebaum, Ph.D., *Professor of History.*Jere C. King, Ph.D., *Professor of History.*Gerhart B. Ladner, Ph.D., *Professor of History.*Andrew Lossky, Ph.D., *Professor of History.*Lauro R. Martinez, Ph.D., *Professor of History.*Terence O. Ranger, Ph.D., *Professor of History.*Hans J. Rogger, Ph.D., *Professor of History.*Theodore Saloutos, Ph.D., *Professor of History.*Stanford Shaw, Ph.D., *Professor of History.*Stephan A. Thernstrom, Ph.D., *Professor of History.*Speros Vryonis, Jr., Ph.D., *Professor of History.*Eugen Weber, M.Litt., *Professor of History.*†Hayden V. White, Ph.D., *Professor of History.*

† Absent on leave, 1970-1971.

- Lynn T. White, Ph.D., *Professor of History.*  
 Robert Wohl, Ph.D., *Professor of History.*  
 Stanley A. Wolpert, Ph.D., *Professor of History (Chairman of the Department).*  
 Eugene N. Anderson, Ph.D., *Emeritus Professor of History.*  
 John W. Caughey, Ph.D., *Emeritus Professor of History.*  
 Brainerd Dyer, Ph.D., *Emeritus Professor of History.*  
 Yu-Shan Han, Ph.D., *Emeritus Professor of History.*  
 Clinton N. Howard, Ph.D., *Emeritus Professor of History.*  
 Rainer Berger, Ph.D., *Associate Professor of History and Geophysics.*  
 Cornelius W. Bolle, Ph.D., *Associate Professor of History.*  
 Giorgio Buccellati, Ph.D., *Associate Professor of History and Near Eastern Languages.*  
 John G. Burke, Ph.D., *Associate Professor of History.*  
 E. Bradford Burns, Ph.D., *Associate Professor of History (Vice Chairman of the Department).*  
 Claus-Peter Clasen, Ph.D., *Associate Professor of History.*  
 Robert Dallek, Ph.D., *Associate Professor of History.*  
 David M. Farquhar, Ph.D., *Associate Professor of History.*  
 Raymond H. Fisher, Ph.D., *Associate Professor of History.*  
 Amos Funkenstein, Ph.D., *Associate Professor of History.*  
 Frank O. Gatell, Ph.D., *Associate Professor of History.*  
 Richard Hovannisian, Ph.D., *Associate Professor of History.*  
 Norris C. Hundley, Ph.D., *Associate Professor of History.*  
 Nikki Keddie, Ph.D., *Associate Professor of History.*  
 John H. M. Laslett, D.Phil., *Associate Professor of History.*  
 D. Cresap Moore, Ph.D., *Associate Professor of History.*  
 Gary B. Nash, Ph.D., *Associate Professor of History.*  
 Boniface I. Obichere, D.Phil., *Associate Professor of History.*  
 Richard H. Rouse, Ph.D., *Associate Professor of History.*  
 Alexander P. Saxton, Ph.D., *Associate Professor of History.*  
 Eleanor M. Searle, Lic. Med. Stud., *Associate Professor of History.*  
 †Arthur J. Slavin, Ph.D., *Associate Professor of History.*  
 James W. Wilkie, Ph.D., *Associate Professor of History.*  
 Robert A. Wilson, Ph.D., *Associate Professor of History.*  
 Edward A. Alpers, Ph.D., *Assistant Professor of History.*  
 Philip J. Borden, Ph.D., *Assistant Professor of History.*  
 Robert P. Brenner, Ph.D., *Assistant Professor of History.*  
 Christopher Ehret, Ph.D., *Assistant Professor of History.*  
 Robert R. Griffith, Ph.D., *Assistant Professor of History.*  
 Philip C. Huang, Ph.D., *Assistant Professor of History.*  
 Temma E. Kaplan, Ph.D., *Assistant Professor of History.*  
 Larry G. Kincaid, Ph.D., *Assistant Professor of History.*  
 †Peter Loewenberg, Ph.D., *Assistant Professor of History.*  
 Franklin F. Mendels, Ph.D., *Assistant Professor of History.*  
 H. Viscount Nelson, Ph.D., *Assistant Professor of History.*  
 Fred G. Notehelfer, Ph.D., *Assistant Professor of History.*  
 Peter H. Reill, Ph.D., *Assistant Professor of History.*  
 Damodar R. SarDesai, Ph.D., *Assistant Professor of History.*  
 Geoffrey W. Symcox, Ph.D., *Assistant Professor of History.*  
 †Ronald T. Takaki, Ph.D., *Assistant Professor of History.*  
 Richard Weiss, Ph.D., *Assistant Professor of History.*  
 \_\_\_\_\_, *Assistant Professor of History.*  
 \_\_\_\_\_, *Assistant Professor of History.*

† Absent on leave, 1970-1971.

\_\_\_\_\_, *Assistant Professor of History.*

\_\_\_\_\_, *Assistant Professor of History.*



Keith B. Berwick, Ph.D., *Lecturer in History.*

†Fawn M. Brodie, M.A., *Senior Lecturer in History.*

Albert Hoxie, M.A., *Lecturer in History.*

Miriam Lichtheim, Ph.D., *Lecturer in History.*

Juan Gomez-Quinones, M.A., *Acting Assistant Professor of History.*

Thomas S. Hines, M.A., *Acting Assistant Professor of History.*

Michael O. Jones, M.A., *Acting Assistant Professor of History and Folklore.*

William R. Tillman, M.A., *Acting Assistant Professor of History.*

Robert S. Westman, C.Ph., *Acting Assistant Professor of History.*

#### Preparation for the Major

Required: courses 1A-1B-1C. Three additional one-quarter lower division courses, at least one of which shall be taken from History 2A-2B, History 8 or History 9A-9B-9C-9D.

History majors must take at least two one-quarter courses in U.S. history, either in the lower division as part of the preparation for the major, or in the upper division as part of the major. (See below.)

All history majors shall take at least four courses in other departments in the division of social sciences, whether lower or upper division (anthropology, geography, economics, political science, sociology, psychology, except Psychology 12 and 115).

#### The Major

A minimum of 10 upper division courses in history which must include courses 100 and either 197 or 199.

Only one course offered outside of the History Department will count as a Major course without petition: Medical History 107B, Historical Development of Medical Science.

Recommended: French, German, Latin, Spanish, Italian, or Russian. For upper division work in history, a reading knowledge of one of these is useful. For language requirements for graduate work, see pages 156-160 of this bulletin.

#### The Honors Major

Students are admitted to honors candidacy by the departmental honors committee. Attention is called to the fact that honors will normally be awarded only to those students who successfully complete the honors program.

1. Students in the honors program are required to take: (a) course 100 (one quarter)

in their junior year; (b) course 199 honors; (two quarters) in their senior year, during which time they shall prepare an honors thesis.

2. Four courses in other departments in the division of social sciences, either lower or upper division (anthropology, geography, economics, political science, sociology, psychology, except Psychology 12 and 115).

3. Honors candidates are required to take two comprehensive examinations at the end of the senior year: one in the student's major field (to be determined in consultation with the director of the honors program), and one in the broader area of historical interpretation.

4. Honors candidates may, with consent of the director of the honors program, take up to three quarters of 190 (directed reading) in preparation for the comprehensive examinations. This will count towards the overall requirement of upper division courses demanded of all majors.

#### Teaching Minor in History

The teaching minor in history for purposes of the elementary, secondary and junior college teaching credentials consists of the following: nine courses (of which two must be in United States history) to include: (1) 1A-1B-1C (Introduction to Western Civilization); or 101A-101B-101C (Western Civilization); (2) two courses selected from: 2A-2B (History of Technology from Antiquity to the Twentieth Century), 7A-7B (Political and Social History of the United States), 8 (Latin America: Reform and Revolution), 9A-9B-9C-9D (History of India, China, Japan and the Near East); and (3) four upper division quarter courses selected from two of the fields listed under the M.A. program in history, or the history of science.

† Absent on leave, 1970-1971.

### Admission to Graduate Status

For admission to graduate status in the History Department students should normally have completed the undergraduate major or its equivalent; have received a bachelor's degree or its equivalent from an acceptable college or university; and have maintained at least a B-plus average in that major and a B average in all courses taken in the junior and senior years. The Department requires applicants to provide two letters of recommendation. In certain cases the Department may also require the Graduate Record Examination scores on the aptitude tests, but will in all cases be glad to receive these scores for consideration. Applicants for the field of U.S. History are required to submit GRE scores for the advanced test as well as for aptitude tests. Students not meeting the grade-point average may be admitted if their letters of recommendation and their Graduate Record Examination scores or other evidence indicate unusual promise. Students may be admitted with subject deficiencies, but such deficiencies will have to be made up by taking courses in addition to requirements for an advanced degree program. Applications for the academic year should be submitted by January 15. Students are expected to begin their graduate work in the fall quarter. Only in exceptional cases will students be allowed to begin their work in the winter or spring quarter.

Information and applications for the Graduate Record Examination may be obtained by writing to the Educational Testing Service, 1947 Center Street, Berkeley, California 94704 or, for applicants east of the Rocky Mountain states, the Educational Testing Service, Box 955, Princeton, New Jersey 08540.

### Requirements for the General Secondary Teaching Credential

Consult the ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

### Requirements for the Master's Degree

A candidate for the degree of Master of Arts must meet the requirements set forth by the Graduate Council as stated on page 152.

*Foreign Language.* A reading knowledge of a foreign language approved by the Department for the field of history in which the candidate is working. It is recommended that this requirement be met by the second quarter of graduate work.

*Units of Work.* A minimum of nine upper division and graduate quarter courses in his-

tory. At least five of these must be graduate courses in history. Further, four of the nine courses must be in a field or fields other than that of the Master's examination. No course in the 300 series may be counted toward this requirement, and only one of the 500 series.

*Master's Examination.* The Department follows the Comprehensive Examination Plan (see page 155). By the end of the fourth quarter of full time graduate work in the Department the candidate must pass a three hour written examination in a field chosen by him from the following list: Ancient History; Medieval History, 300-1500; Modern European History since 1500; British History since 1485; African History; Far Eastern History since 1368; United States History since 1492; Latin American History since 1492; Near Eastern History; Indian History; Jewish History; Byzantine; Ancient Near East; Southeast Asia.

An acquaintance solely with textbook information will not be adequate. The student is advised to consult lists of recommended readings prepared by the Department, and to confer at the outset of his graduate work with instructors offering graduate courses in the field in which he proposes to present himself for examination. The Master's examination will ordinarily be given once each quarter on dates announced by the Graduate Adviser.

### Requirements for the Doctor's Degree

A candidate for the degree of Doctor of Philosophy in history must meet the general requirements set forth on pages 156-160. Attention is directed to the requirement that a program, extending over the full time of study, must be approved by the Department. A command of good English, spoken and written, the ability to read at least two foreign languages, and an acquaintance with general history are expected of all candidates. The candidate is required to take at least one continuing history seminar of either two or three quarters.

### EXAMINATION

*Foreign Language Requirements.* A reading knowledge of the languages prescribed below for the major fields is required. If only two languages are prescribed the student will display his competence in them by passing examinations administered by the Graduate Division. For a third or fourth language evidence of competence satisfactory to the chairman of the doctoral committee will be considered acceptable.

Every student is urged, when possible and practical, to take a Graduate School Foreign Language Test before entering the department's graduate program as an effort toward fulfilling the foreign language requirements as quickly as possible. No oral qualifying examination for the Ph.D., may be scheduled until the student has passed examinations in two foreign languages.

1. Ancient History. French, German, Latin and Greek.

2. Modern European History and the History of Science. Either French or German and a language needed by the student in his research and approved by the Guidance Committee.

3. Near Eastern History. Three languages—two Western and one Near Eastern—are required. They are to be selected on the basis of the candidate's specialization. The two Western languages will generally be French and German, but Russian may be substituted for one of those in certain cases. Competence in all three foreign languages must be proven by passing examinations administered by the Graduate Division.

4. British History. French and German, with the possibility of substitution.

5. Medieval History. French and German for all candidates plus Greek for those specializing in Byzantine history and Latin for those specializing in western medieval history.

6. African History. Two languages are required. Normally, these are French and German. Portuguese may, with the approval of the chairman of the doctoral committee, be offered in lieu of French; Afrikaans or Dutch in lieu of German. Amharic, or Arabic, or Hausa, or Swahili, may, with the approval of the chairman, be offered in lieu of either French or German. In special circumstances, some other African language may be substituted for either French or German; but this requires the special permission of the Graduate Division in each case.

7. Asian History. (a) Indian: for those specializing in Indian history, three languages chosen from the following: French and/or German, Dutch or Portuguese, plus Hindi and/or one classical or modern regional language of India; (b) Chinese: French or German or Russian plus Chinese and Japanese; (c) Japanese: French and either German or Dutch plus Japanese.

8. United States History. Any two foreign languages. The study of certain

branches of United States history may require additional languages and auxiliary fields.

9. Latin American History. Spanish and Portuguese and either French, German or Russian.

10. Russian History. Russian and German as well as French or another language deemed necessary by the instructor for the candidate's research.

11. History of Religion. French and German plus (in most cases) a classical or ancient language in the religious tradition of the specialization.

12. Jewish History. Hebrew plus another European language or Arabic.

13. Armenian History. Armenian, French, and an additional language or languages deemed necessary for the research to be undertaken. Students specializing in the Ancient and Medieval periods will be encouraged to prepare in Greek and/or Latin, while students specializing in the Modern period will be encouraged to prepare in Turkish and/or Russian.

14. Ancient Near East. French, German and two ancient languages, one of which should be either Akkadian, Egyptian or Hebrew. The other ancient language may be chosen out of Sumerian, Hittite, Ugaritic, Phoenician, Aramaic, Greek or Latin, depending on individual programs. It is expected that the ancient languages, with all attendant problems of philological and textual criticism, will normally constitute the fourth field of the doctoral examination.

15. Southeast Asia. Two languages; one chosen from the following: French, Dutch, Spanish. One of the languages of the area. At present, facilities exist for the teaching of Thai, Vietnamese and Tagalog.

Except in the fields of African, Asian, British and United States history reading knowledge of an appropriate language is required for admission to all graduate seminars.

*Qualifying Examinations.* Before he is admitted to candidacy a student must pass an oral and a written qualifying examination. In these examinations he is expected to show an adequate grasp of the wider fields of historical knowledge and an ability to correlate historical data pertaining to them and to explain their significance. These examinations will be designed to test not merely factual knowledge but also powers of historical analysis and synthesis, critical ability, and capacity for reflective thinking. A knowledge of the history



of any area includes a reasonable knowledge of its historiography and bibliography; of its geography; and of its political, cultural, economic, and other historical aspects. The candidate must offer himself for examination in four fields, one of which may be an approved field in anthropology, economics, geography, language and literature, philosophy, political science, or other allied subjects. This allied field must be comparable in size and scope to the history fields listed below. The candidate should select the fields in consultation with his faculty sponsor, and must receive the Department's approval of all four fields not less than six months before his qualifying examination is taken. To obtain this approval he should supply the Graduate Studies and Guidance Committee with the name of the faculty member who has agreed to serve as the sponsor of his doctoral work and with the details of his proposed program. A full-time graduate student should take his qualifying examinations not later than the end of his ninth quarter of graduate work. A student who fails to meet this requirement may be barred thereafter from graduate courses.

*Fields of Examination.* Ancient Greece; Ancient Rome; The Early Middle Ages, 300-1100; The Later Middle Ages, 1050-1500; Byzantine History; Russia since 862; England, 1485-1763; England since 1763; The British Empire; The Near East, 500-1500; The Near East since 1500; Ancient Near East; Armenia; African History; History of Science to 1600; History of Science since 1600. Europe, Renaissance-Reformation, Renaissance to the French Revolution; Europe since 1740; China 900-1800; China since 1800; Modern Japan; South and Southeast Asia; United States, 1492-1800; United States since 1763; The American West; Latin America, 1492-1830; Latin America since 1759; History of Religions; Jewish History.

The written qualifying examination will consist of a three-hour examination in a field selected by the candidate's committee. The oral examination will cover all four fields and will normally be held shortly after the written examination, but at the discretion of the doctoral committee it may be held as late as six months after the written examination. Both the written and oral examinations are the responsibility of the committee as a whole. A candidate in the history of science program must select three of the above fields and either the history of medicine or an allied field referred to above. The candidate must also demonstrate a detailed knowledge of the

substance and historical development of a particular science, or of a type of engineering or technology, as a subfield common to the historical fields.

*Final Examination.* The final examination will be oral, and will cover the field within which the dissertation falls. The candidate will be expected to show such a mastery of his special field, and such an acquaintance with the literature, general and special, bearing on it, as would qualify him to give instruction in it to mature students.

#### DISSERTATION

Each candidate is required to present a dissertation on a subject chosen by him of such character as to show a thorough mastery of the sources of information, the ability to carry on independent research and to communicate its results in good literary form. In lieu of the customary type of dissertation, a student may in certain cases edit, or translate and edit, some historical source. Such a project involves careful textual criticism, explanatory annotations, and an historical introduction clearly showing the contribution of the source to historical knowledge. The dissertation must be completed within five years of the qualifying examinations. Any extension of this period must be secured annually from the Chairman of the Department.

#### Lower Division Courses

##### 1A-1B-1C. Introduction to Western Civilization.

Lecture and discussion. A broad, historical study of major elements in the Western heritage from the world of the Greeks to that of the twentieth century, designed to further the beginning student's general education, introduce him to ideas, attitudes, and institutions basic to Western civilization, and to acquaint him, through reading and critical discussion, with representative contemporary documents and writings of enduring interest.

Mr. Hoxie, Mr. Weber, Mr. Wohl

##### 2A-2B. History of Technology from Antiquity to the Twentieth Century.

(Formerly numbered 105A-105B.) Designed for students in the natural sciences, social sciences, and fine arts. It is a survey of the development of man's ability to understand more fully and to utilize more efficiently his natural environment, stressing technology's changing social, economic, scientific and cultural relationships.

Mr. Burke

##### 7A-7B. Political and Social History of the United States.

Lecture and discussion. This course is designed for students in the social sciences who want a thorough survey of the political and social development of the United States as a background for their major work and for students in other departments who desire to increase their understanding of the rise of American civilization.

The Staff

**8. Latin America: Reform and Revolution.**

A general introduction to Latin America emphasizing those institutions from the past which have shaped the present and the struggle for change in the twentieth century. Movies and discussions complement the topical lectures. Mr. Burns and Staff

**9A-9D. Introduction to Asian Civilizations. (1 course each)****9A. History of India.**

An introductory survey for beginning students of the major cultural, social, and political ideas, traditions, and institutions of Indic civilization.

Mr. Wolpert

**9B. History of China.**

Survey of the history of China: the evolution of characteristic Chinese institutions and modes of thought from antiquity to 1950; the problems of political change; China's response to the western impact in modern times. Mr. Farquhar

**9C. History of Japan.**

A survey of Japanese history from earliest recorded times to the present with emphasis on the development of Japan as a cultural daughter of China. Attention will be given to the manner in which Chinese culture was Japaneseized and the aspects of Japanese civilization which became unique. The creation of the modern state in the last century and the impact of western civilization on Japanese culture will be treated.

Mr. Notebelfer, Mr. Wilson

**9D. History of the Near and Middle East.**

A survey of the major social, cultural and political institutions and ideas of the Near East.

Mrs. Keddie

**Upper Division Courses**

The prerequisite for all upper division courses is upper division standing or consent of the instructor, unless otherwise stated. For certain graduate courses which are open to students with Upper Division standing and with the permission of the instructor, see page 340.

**100. History and Historians.**

(Formerly numbered 197.) Required of all history majors in their junior year. A study of historiography, including the intellectual processes by which history is written, the results of these processes, and the sources and development of history. Attention also to representative historians.

Mr. Fisher, Mr. Reill, Mr. H. White

**101A-101B-101C. Western Civilization.**

Lecture. A broad, historical study of major elements in the Western heritage from the world of the Greeks to that of the twentieth century. Primarily designed for non-history majors. May not be taken for credit by students who have taken History 1A-1B-1C.

Mr. Symcox, Mr. Weber Mr. Wohl

**102A-102B. Introduction to European Economic History.**

A survey of the economic, demographic, institutional, and technological changes that have affected the balance between population and means of subsistence from the early Middle Ages until World War I in Europe. 102A ends in 1700; 102B at World War I.

Mr. Mendels

**105. Folklore in American Society.**

(Same as Folklore 105). Prerequisite: junior standing. A cultural-historical survey of the role of folklore in the development of American civilization and of the influence of the American experience in the shaping of folklore in American society.

Mr. Jones

**106A-106D. History of Science.**

Science and scientific thought in relationship to society.

106A. From ancient times to the 17th century.

Mr. Westman

106B. 17th to the 20th century.

Mr. Burke

106C. 20th century.

Mr. Berger, Mr. Burke

106D. Science in America.

Mr. Borden

**107. Scientific Dating Methods in History.**

Prerequisite: consent of instructor. Introduction to scientific dating methods in history such as radiocarbon dating, radiation damage methods, biological dating techniques, magnetic dating, and chemical and physical analyses establishing provenience.

Mr. Berger

**111A-111B-111C. History of the Ancient Mediterranean World.**

111A. A survey of the history of the ancient East from earliest times to the foundation of the Persian Empire.

111B. The history and institutions of the Greeks from their arrival to the death of Alexander.

111C. The history and institutions of Rome from the founding of the city to the death of Constantine.

Mr. Brown, Mr. Chambers

**112A-112B. History of Ancient Greece.**

112A. The Greek city-state. The emphasis will be on the period between the Persian Wars and the rise of Macedon.

112B. The Hellenistic Period. A consideration of the new patterns in government, social life, science, and the arts that appeared between the Macedonian conquest and the decisive intervention of Rome.

Mr. Brown

**113A-113B. History of Rome.**

113A. To the death of Caesar. Emphasis will be placed on the development of imperialism and on the constitutional and social struggles of the late republic.

113B. From the death of Caesar to the time of Constantine. The early empire will be treated in more detail supplemented by a survey of the social and economic changes in the third century.

Mr. Chambers

**117. History of Ancient Egypt.**

A cultural history of ancient Egypt from predynastic times to the end of the new kingdom.

Miss Lichtheim

**121A. The Early Middle Ages.**

A survey of religious, intellectual, artistic, social, and economic changes in Europe from the decay of the Roman Empire until about 1050. Mr. L. White

**121B. The Later Middle Ages.**

A continuation of course 121A, from 1050 to about 1450, with the added consideration of the new scientific movements.

Mr. L. White

**123A-123B-123C. Byzantine History.**

The course stresses the political, socio-economic, religious, and cultural continuity in the millennial history of Byzantium. It begins with the reforms of Diocletian and includes such topics as Byzantium's relations with Latin Europe, Slavs, Sassanids, Arabs, and Turks.

Mr. Vryonis

**124A-124B. History of Religions.**

Introduction to the study of the history of religions. Discussion of the various systems, ideas and fashions in Western scholarship that have dominated the study of religion since the 18th century.

Mr. Bolle

**124C. Religions of the Ancient Near East.**

The main polytheistic systems of the ancient Near East, with emphasis on Mesopotamia and Syria, and with reference to the religion of ancient Israel: varying concepts of divinity, hierarchies of gods, prayer and cult, magics, wisdom and moral conduct.

Mr. Buccellati

**125A-125B-125C. History of Africa.**

History of the societies of sub-Saharan Africa.

The Staff

**126A-126B. History of West Africa.**

126A. West Africa from earliest times to 1800.

126B. West Africa since 1800.

Mr. Griffith, Mr. Obichere

**127A-127B. History of East and Central Africa.**

127A. History of East Africa from its peopling to the gaining of independence. Particular attention is paid to state formation, long distance trade, and the rise of nationalism.

Mr. Alpers

127B. Development of social and political institutions from the rise of the great Central African state systems to the present.

Mr. Ranger

**128A-128B. History of Southern Africa.**

128A. History of Southern Africa from origins to 1870. The origins of the South African peoples and their interactions to 1870. Attention will be given to social and economic, as well as political aspects.

128B. History of Southern Africa since 1870. The interactions between the inhabitants of Southern Africa since 1870. Attention will be given to social and economic, as well as political aspects.

Mr. Ehret

**129. History of Northeast Africa.**

Cultural and economic developments from earliest times. The Semitic settlement in Ethiopia and the kingdom of Axum. Ethiopia from the decline of Axum to modern times.

Mr. Alpers, Mr. Ehret

**131A-131B-131C. Armenian History.**

A survey of the political, economic, and cultural history of Armenia from ancient to modern times.

131A. The question of origins to the fall of the Bagratid kingdom, 11th century A.D.

131B. The Cilician kingdom, the Turkic conquests, and the Armenian cultural and political renaissance.

131C. The Armenian emancipatory struggle, the World War, the Independent Republic, and Soviet Armenia.

Mr. Hovannisian

**132. The Caucasus Since 1801.**

A survey of the political, economic, social, and cultural developments in the Caucasus since the Russian conquests. The interrelationship of Georgians, Azerbaijanis, and Armenians, and their individual and collective response to Tsarist Russia and the Soviet Union.

Mr. Hovannisian

**133A-133B. History of North Africa from The Moslem Conquest.**

133A. To 1578.

133B. From 1578 to the present.

**134A-134B. Near and Middle East from 600 A.D.**

134A. The rise of Islam, the Caliphate, the Crusades, the Turkish and Mongol invasions; the rise of the Ottoman Turks.

134B. The Ottoman and Persian empires, decay and westernization, internal change and reform.

Mr. von Grunebaum, Mrs. Keddie

**135. Introduction to Islamic Culture.**

Origins of the Islamic way of life and thought, survey of Islamic history, Islamic literature in English translation, interaction of the Islamic world and Europe in medieval and modern times.

Mr. von Grunebaum

**136. Islamic Institutions and Political Ideas.**

Institutions and ideas of government, administration, justice, education, economic and social life in the Islamic Near East as they were before the impact of the West, and as they were affected by that impact.

Mr. von Grunebaum

**137A-137B. Jewish Intellectual History.**

(Formerly numbered 138C.) 137A will cover the medieval period; 137B the modern period. This course studies the development of the Jewish self-understanding in relation to the intellectual climate of the environment, as expressed in the halacha, in philosophy, and in cabbalism.

Mr. Funkenstein

**138A-138B. Jewish History.**

Jewish history from Biblical times to our period.

Mr. Funkenstein

**139A-139B-139C. History of the Turks.**

A survey of the society, government, and political history of the Turks from earliest times to the present.

139A. Origins to the sixteenth century.

Mr. Vryonis

139B. Sixteenth to the nineteenth century.

Mr. Shaw

139C. Nineteenth and twentieth centuries.

Mr. Shaw

**140A-140B. History of Ancient Mesopotamia and Syria.**

(Formerly numbered 200A-200B.) The political and cultural development of the "Fertile Crescent," including Palestine, from the Neolithic to the Achaemenid period.

Mr. Buccellati

**141A-141G. History of Modern Europe.**

141A. The Renaissance.

Mr. Martines

141B. The Reformation.

Mr. Clasen

141C. Europe: 1560-1660. Mr. Hoxie, Mr. Lossky

141D. Europe under the old Regime.

141E. Europe, 1789-1848.

Mr. King

141F. Europe, 1848-1900.

Mr. King, Mr. Reiff

141G. Europe in the 20th Century.

Mr. King, Mr. Wohl

**142A-142D. Cultural and Intellectual History of Modern Europe.**

Climates of taste and climates of opinion. Educational, moral and religious attitudes; the art, thought,

and manners of the time in an historical context. Quarter courses are oriented approximately as follows:

- 142A. 16th Century Mr. Hoxie, Mr. Westman  
 142B. 17th and 18th Centuries. (Formerly numbered 142A.) Mr. Hoxie  
 142C. 19th Century. (Formerly numbered 142B.) Mr. Hoxie, Mr. Weber  
 142D. 20th Century. (Formerly numbered 142C.) Mr. Hoxie, Mr. Weber

#### 143A-143E. History of Modern France.

- 143A. 1450-1620. Mr. Lossky  
 143B. 1620-1789. Mr. Lossky  
 143C. The Revolution and Napoleon.  
 143D. 1815-1870. Mr. King  
 143E. Contemporary France. Mr. King

#### 144A-144B-144C. History of Modern Germany.

- 144A. 18th Century. Mr. Reill  
 144B. 19th Century. Mr. Loewenberg  
 144C. 20th Century. Mr. Loewenberg

#### 145A-145B. The Netherlands in European Affairs, 1450-1795.

- 145A. From the Burgundian unifications to the Truce of 1609. Mr. Lossky  
 145B. From the Truce of 1609 to the end of the Dutch Republic. Mr. Lossky

#### 146A-146B-146C. History of Russia.

- 146A. From 1240-1796.  
 Political, social, and economic developments, and foreign relations in the Muscovite and imperial periods.

146B. 1796-1917.

The Great Reforms, the agrarian problem and backwardness, the radical movement, the revolution of 1905; foreign relations, especially the Near Eastern question. Either part of the course may be taken without the other.

146C. The Soviet Union, 1917 to the present.

The Bolshevik Revolution, consolidation of the regime, collectivization and industrialization, foreign policy and domestic developments.

Mr. Fisher, Mr. Rogger

#### 147A-147B-147C. European International Relations.

Survey of European diplomatic and military history.

147A-147B. Early modern period (1500-1815).

Mr. Symcox

147C. Late modern period (1815-1970).

Mr. King

#### 148A-148B. History of Italy.

148A. Late Middle Ages to Unity.

The Italian people from the late Middle Ages to the achievement of national unity. Mr. Wohl

148B. 1861 to the Present.

Political, economic, social, diplomatic and ideological developments. Mr. Wohl

#### 149C-149D. History of Spain and Portugal.

Political, social and economic history of Spain and Portugal since the Muslim invasion. First quarter: 711-1700; second quarter: since 1700. Miss Kaplan

#### 149A-149B-149C. History of Eastern Europe.

149A. The Balkans. From the 14th century to 1878.

149B. East-Central Europe to 1800. The Western Slavs, their Baltic and Danubian neighbors.

149C. Contemporary East Central Europe and the Balkans. Mr. Shaw, Mr. Vryonis

#### 150A-150H. Studies in English History.

(Formerly numbered 152A-152B, 153A-153B, 155, 156, and 157.)

150A-150B. Medieval England. Mrs. Searle

150C-150D. Renaissance England. Mr. Slavin

150E-150F. Early Modern England.

17th and 18th Century England.

150G-150H. Modern England.

19th and 20th Century England. Mr. Moore

#### 158A-158B. The British Empire Since 1783.

The political and economic development of the British Empire, including the evolution of colonial nationalism, the development of the commonwealth idea, and changes in British colonial policy.

Mr. Galbraith, Mr. Sar Desai

#### 162A-162B. Latin America in the 19th and 20th Centuries.

162A. Latin America in the 19th Century. An intensive analysis of the economic, social, and political problems of the Latin American nations from their independence to around 1910.

Mr. Burns, Mr. Barr

162B. Latin America in the Twentieth Century. An examination of society, economy, and politics in Latin America in the 20th Century.

Mr. Burr, Mr. Wilkie

#### 163A-163B. The History of Brazil.

The lectures treat selected topics in the political, economic, social, and cultural development of Brazil. Discussions, movies, and guest speakers supplement and complement the lectures. The first quarter covers the colonial, independence, and early imperial periods; the second deals with modernization and reform, 1850 to the present.

Mr. Burns

#### 166. The Mexican Revolution.

The structure of "Permanent Revolution" since 1910.

Mr. Wilkie

#### 168A-168B. Colonial Latin America.

Studies in the general development of Latin America prior to 1825 with emphasis on social history.

#### 169. Diplomatic History of Latin America.

Emphasizes the historical development of a distinctive system of international relations among the nations of the Western Hemisphere, from 1808 to the present.

Mr. Burr

#### 171A. The United States: Colonial Period to 1763.

Political and social history of the thirteen colonies and their neighbors; European background, settlement and westward expansion, intercolonial conflicts, beginnings of culture, colonial opposition to imperial authority.

Mr. Nash, Mr. Tillman

### 171B. The United States: the New Nation, 1763-1800.

Political and social history of the American nation, with emphasis upon the rise of the new west, revolution, confederation, and union; the fathers of the Constitution. Mr. Nash, Mr. Tillman

### 172A-172B. The United States: 1800-1850.

172A. Jeffersonian America. Jeffersonian Republican ascendancy and the Era of Good Feelings, 1800-1828; disintegration of the Federalist opposition; the testing of American nationality in the second war with Britain; beginnings of the transportation and industrial revolutions; restructuring of politics in an increasingly egalitarian age.

172B. Jacksonian America and Beyond. The "Jacksonian Revolution" and its aftermath, 1829-1850; the problem of national power versus state sovereignty; problems of rapid social change through industrialization and urbanization; reform impulse; antislavery movements; territorial expansion as focus for sectional rivalry. Mrs. Brodie, Mr. Gatell, Mr. Saxton

### 173A. The United States: Civil War and Reconstruction.

The topics studied will include: the rise of sectionalism, the antislavery crusade; the formation of the Confederate States; the war years; political and social reconstruction. Mr. Kincaid, Mr. Saxton

### 173B. The United States, 1875-1900.

American political, social, and institutional history in a period of great change. Emphasis on the altering concepts of the role of government and the responses to that alteration. Mr. Saxton

### 174A-174B. The United States: The Twentieth Century.

The political, economic, intellectual, and cultural aspects of American democracy in the twentieth century. Mr. Cohen, Mr. Weiss

### 175A-175B. History of American Capitalism Since the Civil War.

Recommended preparation: courses 7A-7B and Economics 13. A study of the changes in agriculture, industry, labor, banking, transportation, and commerce in a capitalist society, and of some of the prominent personalities who made these changes possible. Mr. Saloutos

### 176A-176B. Afro-American History.

An emphasis of the social, cultural and political history of Black People in the United States. Mr. Nelson, Mr. Takaki

### 177A-177B. Intellectual History of the United States.

The principal system of ideas about man and God, nature and society, which have been at work in American history. Emphasis on the sources of these ideas, their connections with one another, and their expression in great documents of American thought. Mr. Borden

### 178A-178B. American Diplomatic History.

178A. The establishment of an independent foreign policy, the territorial expansion of the United States, and the emergence of a world power.

178B. The role of the United States in the 20th century world. Mr. Dallek

### 179A-179B. Constitutional History of the United States.

Prerequisite: eight units of United States history or government, or consent of the instructor. A study of the origins and development of the Federal Constitution.

### 180A-180B. Social History of the United States since 1800.

An historical study of the character and values of the American people as affected by regions, classes, and economic change; with particular attention to the cultural roles of women, businessmen, Negroes, and ethnic groups. Mr. Hines

### 180C. Social History of American Architecture.

Prerequisite: sophomore standing. Survey of American architectural development with emphasis on popular taste, stylistic change, the role of clients, and aspects of city planning, particularly in the late nineteenth and early twentieth centuries. Mr. Hines

### 181. The American West.

A study of the West as frontier and as region, in transit from the Atlantic seaboard to the Pacific, and from the 17th century to the present. Mr. Hundley

### 182. The Immigrant in America.

A historical analysis of the social and economic causes and effects of immigration, particularly after the 1880's, emphasizing the problems of acculturation and adjustment. The restrictionists and the implications of immigration policy on U. S. foreign policy will be stressed. Mr. Saloutos

### 183. Racial Attitudes in America.

The course will trace the origins and development of racial attitudes, both scientific and popular, in America from the first English contacts with Africans and Indians in the late 16th century to the present day. Mr. Nash in charge

### 184. American Reform Movements and Reformers.

(Formerly numbered 215.) A study of educational, monetary, labor and agrarian reforms advocated in the nineteenth and twentieth centuries. Mr. Saloutos

### 185. History of United States Labor.

Examines the development of American labor from colonial times to the present day, especially the A. F. of L., the rise of industrial unionism, and those characteristics of American labor which separate it from labor movements elsewhere. Graduates and undergraduates. Mr. Laslett

### 186A-186B. History of the Mexican American.

The character, values, economy, social structure, politics, culture, and intellectual heritage of the Mexican American peoples as related to the history of the United States and Mexico, with emphasis on the Southwest. Mr. Gomez-Quinones

### 188. History of California.

The economic, social, intellectual, and political development of California from the earliest times to the present. Mr. Hundley

### 189A-189B. American Urban History.

189A. A social analysis of the urbanization process down to 1900.

189B. A social analysis of American urbanization in the 20th Century. Mr. Thernstrom

**190. Directed Reading for Honors. (½ to 1 course)**

Reading to fill gaps in the historical training of individual honors students. Reports on reading will be made at regular intervals. May be taken for up to three quarters. The Staff

**191A-191B-191C. History of China.**

191A. From Beginning to 900.

191B. 900-1800.

Prerequisite: course 9B or 191A, or consent of the instructor.

191C. 1800 to the present.

Mr. Farquhar, Mr. Huang

**193. Diplomatic History of the Far East.**

The role of the Far Eastern states in the international community beginning with the establishment of the Treaty System in China and the opening of Japan to intercourse with the rest of the world in 1854. Mr. Wilson

**195A-195C. Japanese History.**

The political, economic, and cultural development of Japan, from pre-history to the present.

195A. Ancient: Pre-history-1600.

195B. Early Modern: 1600-1868.

195C. Modern: 1868-present. Mr. Notehelfer

**196A. Early History of India.**

Introduction to the civilization and institutions of India. A survey of the history and culture of the South Asian subcontinent from the earliest times to the founding of the Mughal Empire. Mr. Wolpert

**196B. Recent History of India and Pakistan.**

History of the South Asian subcontinent from the founding of the Mughal Empire, through the eras of European expansion, British rule, and the nationalist movement, to the present. Mr. Wolpert

**196C-196D. History of Southeast Asia.**

196C. Early History of Southeast Asia. A political and cultural history of the peoples of Southeast Asia from the earliest times to about 1815.

196D. Southeast Asia since 1815. History of modern Southeast Asia with emphasis on expansion of European influence in the political and economic spheres, growth of nationalism and the process of decolonization. Mr. Sar Desai

**197. Undergraduate Colloquia.**

(Two courses only may be taken for credit.) Intensive readings, discussions, papers. Weekly meetings. Enrollment limited to 15 students per section. Signups and description of offerings each quarter at History Department office. The Staff

**199. Special Studies in History.**

By consent of the instructor. An intensive directed research program. Honors candidates may take two quarter courses for credit. Mr. Hoxie and the Staff

**Graduate Courses****200-215. Graduate Lecture Courses.**

Prerequisite: graduate status or, with permission of instructor, upper division standing.

**201A. History of the Eurasian Nomadic Empires.**

(Formerly numbered 139C.) This course outlines the history of the great Eurasian nomadic empires

(2nd century B.C.-13th century A.D.) with emphasis on their relations with the late Roman and the Byzantine Empires as well as the peoples of Eastern Europe and the Near East. Mr. Eckmann

**201B. Themes in Early and Modern Chinese History.**

A close examination of various topics and periods mainly between the years 900 and 1800. Mr. Farquhar

**203. History of Ancient Egypt in the Late Period.**

Prerequisite: course 117 and a background in Graeco-Roman history. A cultural history of ancient Egypt from the end of the new kingdom to the coming of Christianity. Miss Lichtheim

**204A-204B-204C. History of the Church in the Middle Ages.**

A course on the development of Christian doctrines, on ecclesiastical institutions and on relations between the Church and empires, kingdoms, and lay society, from the beginnings of Christianity to the Councils of Trent. Mr. Ladner

**205A-205B. Medieval and Renaissance Italy.**

The course will treat Italian city-states, particularly Venice, Florence, Milan, and Genoa, between 1100 and 1500, emphasizing urban society, urban problems, politics, and institutions. Italian cities will be contrasted with major Northern European cities. Mr. Martines

**206. Russian Intellectual History.**

(Formerly numbered 147.) Social thought and social movements, primarily in the 19th century. A background in Russian history or literature is required. Mr. Rogger

**207. Armenian Intellectual History.**

(Formerly numbered 131D.) Intellectual and cultural trends reflected in Armenian literature, historiography, religious and philosophical thought. Mr. Sanjian

**208. Modern British Biography.**

(Formerly numbered 150.) A study of the lives of leaders of Britain, the development of biographical technique and the place of biography in the writing of history.

**209A-209B. The Modern Middle East.**

(Formerly numbered 137A-137B.) Social, intellectual and political change in Turkey, Iran and the Arab countries from Napoleon's invasion of Egypt to the present. Mrs. Keddie

**210A-210B. Morocco and Europe to the End of the French Protectorate.**

The interaction of indigenous traditions, political, social, institutional, with European influence emerging mostly from Portugal, Spain and France. Morocco will be the focus of attention with the rest of North Africa providing a basis for comparison.

**211A-211B-211C. Islamic Iran.**

(Formerly numbered 132A-132B.) Political, social and cultural history of Persia.

A. 600 to 1400.

B. 1400 to 1800.

C. 1800 to the Present.

Mr. Banani

Mr. Banani

Mrs. Keddie

**212. Intellectual History of Recent China.**

Confucianism on the eve of the encounter with the West; Chinese intellectuals' response to the West and modern Japan in the nineteenth and twentieth centuries. Mr. Huang

**214. Social and Intellectual History of Recent Japan.**

The social changes which accompanied the political and economic transformation of modern Japan and the necessary adaptation of the Confucian value system. Mr. Notchelfer

**215A-215B-215C. History of Western Education.**

(Same as Education 201A-B-C.)

215A. The rise of western educational tradition from the Greeks to the 20th Century.

215B. The history of American education to 1860.

215C. The history of American education from 1860 to the present. Mr. Cohen

**217. Early Modern Britain and the Continent: Comparative Studies in Social Change.**

Socio-political change in relation to ideological development, 1550-1700, with emphasis placed on the periods of the religious wars and on the "Seventeenth Century Crisis" of the state and of the economy. Mr. Brenner, Mr. Symcox

**222A-222B. Studies in Medieval Latin Literary History.**

An introduction to medieval Latin literary history, examining several basic forms of literature produced in the monastery, the university, and the secular world. Considerable attention given to the survival of the classical authors and to the contemporary sources for the study of medieval literary history. Mr. Rouse

**223A-223B. Introduction to the Sources of Medieval and Early Modern History.**

This course describes and exemplifies the main types of sources and introduces the student to the use of libraries, archives and source collections as well as to the principal auxiliary sciences of history such as codicology, diplomatics, chronology and sfragistics. Mr. Rouse

**224. Later Medieval Latin Palaeography and Manuscripts, 1100-1500.**

An intensive training in the reading of select Medieval and Renaissance hands and in the tools and techniques of textual and literary history. Mr. Rouse

**225. Introduction to Historical Methods.**

An historical and analytical examination of the methods of historical study and the assumptions and premises to which these methods are related. Mr. Moore, Mr. H. White

**226. Selected Topics in Dating Techniques in Archaeology and History.**

(Same as Anthropology 282.) Prerequisite: course 107. A colloquium devoted to topics in dating techniques in archaeology and history, as well as laboratory instruction and experimental work. May be repeated for credit. Mr. Berger

**228. Methods in Armenian Oral History.**

Prerequisite: course 131C or its equivalent, and proficiency in the Armenian language. Lectures and laboratory in the methods of taking, processing, and utilizing oral depositions relating to modern Armenian history. The course will include an assignment in the field. Mr. Hovannissian

**†230A-230T. Advanced Historiography.**

(Formerly numbered 202A-202R.) A. Ancient Greece; B. Ancient Rome; C. Medieval; D. Early Modern Europe; E. Modern Europe; F. Russia/Eastern Europe; G. Britain; H. United States; I. Latin America; J. Near East; K. India; L. China; M. Japan; N. Africa; O. Science/Technology; P. History of Religions; Q. Theory of History; R. Jewish History; S. Armenian; T. Southeast Asia. May be repeated for credit. The Staff

**†240A-240T. Topics in History.**

(Formerly numbered 208A-208R.) A through T as for 230. A graduate course involving reading, lecturing, and discussion of selected topics. This course does not fulfill the seminar requirements for the Ph.D. degree. May be repeated for credit. The Staff

**250-287. Seminars in History.**

Admission to all graduate seminars is subject to the instructor's approval and to appropriate language qualifications. Credit and grades will be given only on completion of the full seminar sequence.

**250A-250B. Seminar in Ancient History.**

Mr. Brown, Mr. Chambers

**251A-251B. Seminar in the History of the Medieval Church in the West.**

Mr. Ladner

**252A-252B-252C. Seminar in Byzantine History.**

Mr. Vryonias

**253A-253B. Seminar in Medieval History.**

Mr. L. White

**254A-254B. Seminar in the Italian Renaissance.**

Mr. Martines

**255A-255B. Seminar in the Reformation.**

Mr. Clasen

**256A-256B. Seminar in the History of Science.**

Mr. Burke

**257A-257B Seminar in Early Modern European History.**

Mr. Losky, Mr. Martines

**258A-258B. Seminar in English History: Middle Ages and Renaissance.**

Mr. Slavin

**259A-259B. Seminar in English History: Modern History.**

Mr. Moore

**260A-260B. Seminar in Modern European History.**

Mr. King

**261A-261B. Seminar in Modern European History.**

Mr. Weber, Mr. H. White

**262A-262B. Seminar in the Modern History of Spain, Italy and Portugal.**

Mr. Wohl

† Offered as schedule and staff allow.

**263A-263B. Seminar in Russian History.**

Mr. Fisher, Mr. Rogger

**264A-264B. Seminar in British Empire History.**

Mr. Galbraith

**265A-265B. Seminar in African History.**

Mr. Griffith, Mr. Ranger

**266A-266B. Seminar in Latin American History.**

Mr. Burr

**266C-266D. Seminar in Brazilian History.**

(Same as Latin American Studies Center's Interdisciplinary Seminar 250A-250B). Mr. Burns

**267A-267B. Seminar in Near Eastern History.**

The seminar will concentrate on studies in the History of the Near East and on Westernization of the Arab-speaking world in alternate years.

Mr. von Grunebaum

**268A-268B. Seminar in Jewish History.**

Studies in the intellectual and social history of the Jewish people from ancient times to the modern period.

Mr. Funkenstein

**269A-269B. Seminar in Early American History.**

Mr. Nash

**270A-270B. Seminar in Recent United States History.**

Mr. Cohen

**271A-271B-271C. Seminar in Recent American History.**

Mr. Saloutos

**272A-272B. Seminar in United States History of the Middle Nineteenth Century.**

Mrs. Brodie

**273A-273B. Seminar in United States Social and/or Intellectual History.**

Mr. Saxton

**274A-274B. Seminar in the History of the American West.**

Mr. Hundley

**275A-275B. Seminar in American History of the Jacksonian Period.**

Mr. Gatell

**276A-276B. Seminar in American Diplomatic History.**

Mr. Dallek

**277A-277B. Seminar in Afro-American History.**

Social and political history of the Afro-American including an emphasis on the development and structure of race relations in America, and racial concepts and dilemmas, black and white.

Mr. Takaki, Mr. Nelson

**279A-279B. Seminar in Chinese History.**

Mr. Farquhar, Mr. Huang

**280A-280B. Seminar in South and Southeast Asia.**

Mr. Wolpert

**281A-281B. Seminar in Modern Japanese History.**

Mr. Netchelifer, Mr. Wilson

**282A-282B. Seminar in the History of Religions.**

Mr. Bolle

**283A-283B. Seminar in Ottoman and Modern Turkish History.**

Mr. Shaw

**284A-284B. Seminar in the Social History of the Middle East.**

The interrelationship of city, tribe, and village in the Middle East; the role of such definable social groups as women, religious classes, middle classes, landlords, tribesmen, and peasants; social change.

Mrs. Keddle

**285A-285B-285C. Seminar in United States Urban History.**

Mr. Thornstrom

**286A-286B. Seminar in Armenian History.**

Prerequisite: course 131A-B-C or their equivalent. No credit or letter grade will be assigned until completion of entire seminar sequence.

Mr. Hovannisian

**287. Seminar in the History of Education.**

(Same as Education 250.)

Mr. Cohen

Individual Study and Research

**596. Directed Studies. (1/4 to 2 courses)**

The Staff

**597. Directed Studies for Graduate Examinations. (1/4 to 2 courses)**

Preparation for either the Master's Comprehensive Examination or the Ph.D. Qualifying Examinations.

The Staff

**599. Doctoral Research and Writing.**

(1/4 to 2 courses)

Open only to students who have passed the qualifying examination for the Ph.D. degree.

The Staff

Related Course in Another Department

The following course is offered in the Department of Medical History and is accepted for credit.

**Medical History 107B. Historical Development of Medical Science.****■ HUMANITIES**Arnold J. Band, Ph.D., *Professor of Hebrew.*Pier-Maria Pasinetti, Ph.D., *Professor of Italian.*J. Norman H. Austin, Ph.D., *Assistant Professor of Classics.*Ross P. Shideler, *Assistant Professor of Scandinavian Languages and Comparative Literature.*



Selected masterpieces of world literature representing different types and national origins. Recommended as courses to satisfy the H-requirement in the College of Letters and Science.

**1A. World Literature: Antiquity to Renaissance.**

Class meets three hours a week.

**1B. World Literature: Renaissance to Modern Period.**

Class meets three hours a week.

**101. The Romantic Dilemma.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. The theme of Romantic individualism and rebellion, pursued through literary examples of Romantic hero types (and anti-types) from Rousseau and Goethe to Dostoevsky and Hesse. Mrs. Engdahl

**102. Satire.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. The changing nature of satire as illustrated by examples of the genre from Horace and Juvenal to Ionesco and Nabokov. Mr. Austin

**103. English Renaissance Tragedy.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. A close study in lectures and discussions of six Elizabethan-Jacobean plays, with emphasis on those themes and elements, such as revenge, the superman, theatricality and rhetori-

cal extravagance, which define the nature and quality of English Renaissance Tragedy. Particular attention will be paid to the classical and Continental origins of these distinguishing characteristics. Mr. Phillips

**104. The Twentieth Century Continental Novel: Mann and Proust.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. An intensive study of *The Magic Mountain* and *The Remembrance of Things Past* as works of art and as expressions of the sense of social and cultural dissolution felt in early twentieth century Europe. Mr. Pasinetti

**105. The Comic Spirit.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. Literary masterpieces, both dramatic and non-dramatic, selected to demonstrate the varieties of comic expression. Mr. Band

**106. The Grotesque in Literature.**

Prerequisites: courses 1A-1B, or English 1 and 2, or consent of the instructor. Analytic study of major examples of the grotesque in literature with reference to parallel examples in art history. Mrs. Shapiro

Related Courses in Other Departments

**Integrated Arts 1A-1B-1C.**

**Engineering 101. Engineering. Its Role and Function in Human Society.**

**■ INTEGRATED ARTS**

The main manifestations of the creative spirit in the arts of Western Civilization and the problems of their interrelation (literature excluded). For the general student; a knowledge of European history is expected.

**1A. Integrated Arts.**

Lecture, three hours. From Classic Antiquity to the end of the Middle Ages. Mr. Kayser

**1B. Integrated Arts.**

Lecture, three hours. From the Renaissance to the rise of Classicism. Mr. Kayser

**1C. Integrated Arts.**

Lecture, three hours. From the French Revolution to the present. Mr. Kayser

**■ INTERDISCIPLINARY COLLOQUIA**

Organized colloquia involving several disciplines are offered from time to time in conformity with faculty and student interests. They are open to all faculty members and to graduate students assigned to the colloquia by their advisers. Graduate credit is not awarded directly, but may be given through appropriate departmental courses.

**African Studies**

*Committee in Charge.* E. A. Alpers, History (Chairman); M. Gilson, Anthropology; L. J. Kuper, Sociology; M. Lofchie, Political Science; B. I. Obichere, History; J. F. Povey, English; P. O. Proehl, Law; B. E. Thomas, Geography.

A colloquium on Africa in the social sciences will meet biweekly throughout the year. Papers presented and discussed in this colloquium will focus each quarter upon a different integrating theme, such as Urbanization and Migration, Development and Adaptation of Legal Systems in Africa, the Plural Societies of Africa, and similar topics amenable to interdisciplinary discourse.

**Mathematics in the Behavioral Sciences**

*Committee in Charge.* J. Marschak, Business Administration and Economics (chairman); C. D. Allen, Linguistics; J. L. Barnes, Engineering; P. Bonacich, Sociology; E. C.

Carterette, Psychology; T. S. Ferguson, Mathematics; J. Hirschleifer, Economics; D. Kaplan, Philosophy; M. R. Mickey, Biomathematics; D. O. Walter, Physiology.

Meetings are announced in the **UNIVERSITY CALENDAR**.

A colloquium on mathematics in the behavioral sciences will meet biweekly throughout the year. Papers presented and discussed in this colloquium use mathematical language to improve communication between behavioral sciences, and also between these sciences and other branches of knowledge.

## ■ ISLAMIC STUDIES

For details of the undergraduate major, see Curriculum in Near Eastern Studies, pages 76-77 of this catalog.

### Master of Arts in Islamic Studies

The program for the Master of Arts in Islamic Studies is designed primarily for the student desiring to prepare for an academic career. It may, however, be found useful also for the student seeking a general education and desiring a special emphasis in this particular area or for a student who plans to live and work in this area, whose career will be aided by a knowledge of the peoples, languages, and institutions. (Such a career might be centered on teaching, research, business, engineering, journalism, librarianship, or government service.) Subject to the limitations indicated below, the special course of studies is formulated for each candidate according to his experience and requirements.

### Requirements for the Master's Degree

*General Requirements* (as throughout the Graduate Division. See page 152.

*Admission to the Program.* Admission to the Graduate Division with a degree of Bachelor of Arts in Near Eastern Studies or its equivalent is required. The committee to administer the interdepartmental degree in Islamic Studies will pass on the application for admission to the program. A student entering the program is normally expected to have completed the equivalent of advanced Arabic (Arabic 103A-103B-103C), or advanced Persian (Persian 102A-102B-102C), or advanced Turkish (Turkish 103A-103B).

*Plan.* The program is offered under both the Thesis Plan and the Comprehensive Examination Plan. The selection of a plan will be decided upon by the candidate and his adviser and approved by the interdepartmental advisory committee.

### Political Change

*Committee in Charge.* M. Lofchie, Political Science (chairman); L. J. Kuper, Sociology; D. A. Wilson, Political Science; C. Wolf, Jr., Economics; E. V. Wolfenstein, Political Science.

A colloquium on the theoretical analysis of political change will meet regularly throughout the year. Papers presented will emphasize the interaction of the phenomena which are the subject matter of the traditional social science disciplines in the processes of change.

*Language Requirements.* A candidate for the degree of Master of Arts in Islamic Studies will be required to show proficiency in either French or German, in addition to two Near Eastern languages of their field of specialization. The student is expected to pass the graduate foreign language reading examination in either French or German by the end of the second quarter of residence. In view of the scholarly literature in the field, a candidate is earnestly advised to acquaint himself with a second European language in which relevant material for his studies is available.

*Program.* The program of each candidate will be especially prescribed by the interdepartmental advisory committee. The program should, wherever possible, be established before the candidate enters his first quarter of work. The program will be planned to emphasize Arabic, Persian or Turkish (Islamic) studies and is intended particularly for the student desiring to prepare for an academic career in this field.

*Program in Arabic, Persian or Turkish (Islamic) Studies.* The student will be required to continue his language work by taking no less than four courses on the appropriate level in the two Near Eastern languages of his choice. The remaining five courses are to be chosen from the relevant upper division and graduate courses in history, political science or any of the other fields represented in the program depending on the student's preparation and specific needs, with the proviso that the selection must be limited to two of these disciplines. The omission of history may be approved only in exceptional cases. Especially recommended are: History 230J, 240J, 267A-267B, Political Science 250F and Sociology 236, 237.

Other study arrangements in the Near Eastern field are available through the Department of Near Eastern Languages.

#### Requirements for the Ph.D. Degree in Islamic Studies

*General Requirements.* See pages 156-160.

*Admission to the Program.* Competence in one of the relevant Near Eastern languages, or an undergraduate major in one of the social sciences affiliated with the program, that is, at present, history, political science, and sociology, with some specialization in the Near East. The student may be required to take additional work to remove any deficiency in his undergraduate program especially in connection with language preparation.

*Requirements of the Program.* At the beginning of his first quarter in residence, the candidate will present to the chairman of the committee to administer the interdepartmental degree in Islamic Studies a written statement explaining his preparation in one of the two modern languages required by the University (generally French and German). He must pass the graduate foreign language reading examination in both languages by the end of his second year of residence. For work in some fields, a reading knowledge of Italian and/or Spanish is essential. In the first year of graduate study, the candidate will follow essentially the existing master's program in Islamic (Arabic, Persian or Turkish) studies which calls for two Near Eastern languages and literatures as well as two social sciences. Normally the candidate will devote the second year to courses and seminars in departments affiliated with the program, these courses to be determined by the candidate's advisory committee to be appointed by the end of the third quarter of graduate work. This committee is to consist of four faculty members who will supervise the four fields in which the candidate is to be examined. Upon completion of these courses, he will take his qualifying examinations and advance to candidacy. A final year will normally be devoted by the candidate chiefly to the preparation of his dissertation, after which he will take his final oral examination. During this year the candidate may satisfy the residence requirements either by taking additional seminars or by registering in Islamics 599.

#### The Qualifying Examination

The qualifying examination will depend on the social science concentration elected by the student. If, for example, his chosen

field is history, he will be examined on the whole range of Near Eastern history, in one field of sociology or political science, and in the particular Near Eastern languages and literatures of his approved program. Qualifying examinations for students with different concentrations will be constructed accordingly.

#### Lower Division Courses

Arabic 1A-1B-1C. Elementary Arabic.

Geography 1B. Introduction to Geography: Cultural Elements.

10C. World Regional Geography: Africa and the Middle East.

Hebrew.\*

History 9D. History of the Near and Middle East.

Music 71K. Music of Persia.

#### Upper Division Courses

African Languages. †

Anthropology 123. Culture and Personality.

124. Comparative Religion.

125. Comparative Society.

145. Oral Art and Drama of Non-Western Peoples.

146. Musical Arts of Non-Western People.

147. The Cultures of the Arab World.

148. The Theory of Oral Literature.

Arabic 102A-102B-102C. Intermediate Arabic.

102K. Intensive Intermediate Arabic.

103A-103B-103C. Advanced Arabic.

111A-111B-111C. Spoken Egyptian Arabic.

113A-113B-113C. Spoken Iraqi Arabic.

130A-130B-130C. Classical Arabic Texts.

132A-132B-132C. Philosophical Texts in Classical Arabic.

140A-140B-140C. Modern Arabic Texts.

150A-150B. Survey of Arabic Literature in English.

180A-180B-180C. Structure of Literary Arabic.

199. Special Studies in Arabic.

Armenian 101A-101B-101C. Elementary Modern Armenian.

102A-102B-102C. Intermediate Modern Armenian.

130A-130B-130C. Elementary Classical Armenian.

\* See Department of Near Eastern Languages for complete listing and detailed description.

† See Linguistics Department for complete listing and detailed description.

- 131A–131B–131C. Intermediate Classical Armenian.  
 199. Special Studies in Armenian Language and Literature.
- Art** 101A–101B–101C. Egyptian Art and Archeology.  
 103B. Hellenistic Art.  
 104A. Art of the Ancient Near East.  
 104B–104C–104D. Architecture and the Minor Arts of Islam in the Middle Ages.  
 105A. Early Christian and Byzantine Art.  
 105B. Early Medieval Art.  
 114A. Indian Art.  
 198. Special Courses in Art.  
 199. Special Studies in Art.
- Berber** 101A–101B–101C. Elementary Berber.  
 102A–102B–102C. Advanced Berber.  
 120A–120B–120C. Introduction to Berber Literature.  
 199. Special Studies in Berber Languages.
- Caucasian Languages** 111A–111B–111C. Elementary Georgian.  
 199. Special Studies in Caucasian Languages.
- Classics** 145A. Byzantine Civilization: Political Theory, Roman Law and Conflicts with Paganism.  
 145B. Byzantine Civilization: Theology and Relations with Rome.  
 145C. Byzantine Civilization: Literature, Art, Science and the Renaissance.
- Ancient Near East** 120A–120B–120C. Elementary Ancient Egyptian.  
 121A–121B–121C. Intermediate Ancient Egyptian.  
 122A–122B. Late Egyptian.  
 123A–123B. Coptic.  
 150A–150B. Survey of Ancient Near Eastern Literatures in English.  
 160A–160B. Introduction to Near Eastern Archaeology.  
 161A–161B–161C. Archaeology of Mesopotamia.  
 199. Special Studies in the Ancient Near East.
- Geography** 187. The Middle East.  
 188. North Africa.
- Hebrew.**\*
- History** 117. History of Ancient Egypt.  
 121A. The Early Middle Ages.  
 121B. The Later Middle Ages.  
 123A–123B–123C. Byzantine History.
- 124A–124B. History of Religions.  
 126A–126B. History of West Africa.  
 129. History of Northeast Africa.  
 131A–131B–131C. Armenian History.  
 133A–133B. History of North Africa from the Moslem Conquest.  
 134A–134B. Near and Middle East from 600 A.D.  
 135. Introduction to Islamic Culture.  
 136. Islamic Institutions and Political Ideas.  
 137. Intellectual Jewish History. Medieval and Modern.  
 138A–138B. Jewish History.  
 138C. Aspects of Jewish Intellectual History.  
 139A–139B–139C. History of the Turks.  
 140A–140B. History of Ancient Mesopotamia and Syria.  
 149A–149B–149C. History of Eastern Europe.  
 196A. Early History of India.  
 196B. Recent History of India and Pakistan.  
 199. Special Studies in History.
- Music** 145. History and Theory of Persian Music.  
 171K. Music of Persia.
- Near Eastern Languages** 198. Special Studies in Near Eastern Languages.
- Persian** 101A–101B–101C. Elementary Persian.  
 102A–102B–102C. Advanced Persian.  
 150A–150B. Survey of Persian Literature in English  
 199. Special Studies in Persian.
- Political Science** 132. International Relations of the Middle East.  
 164. Governments and Politics in the Middle East.  
 165. Government and Politics in North Africa.
- Semitics** 101A–101B–101C. Elementary Amharic (Modern Ethiopic).  
 102A–102B–102C. Advanced Amharic (Modern Ethiopic).  
 130. Biblical Aramaic.  
 140A–140B. Elementary Akkadian.  
 141A–141B. Advanced Akkadian.
- Sociology** 132. Population and Society in the Middle East.  
 133. Comparative Sociology of the Middle East.  
 151. Culture and Personality.

\* See Department of Near Eastern Languages for complete listing and detailed description.

**Turkic Languages 101A-101B.**

- Elementary Turkish.
- 102A-102B. Intermediate Turkish.
- 103A-103B. Advanced Turkish.
- 110A-110B-110C. Old and Middle Turkic.
- 111A-111B-111C. Chagatai.
- 112A-112B-112C. Uzbek.
- 113A-113B-113C. Kirghiz.
- 190A-190F. Survey of the Turkic Languages.
- 199. Special Studies in Turkic Languages.

**Urdu 101A-101B-101C. Elementary Urdu.****Graduate Courses****African Languages. †****Anthropology 260. Selected Topics in Mediterranean Society and the Arab World.****Arabic 220A-220B-220C. Islamic Texts.**

- 230A-230B-230C. Arabic Poetry.
- 240A-240B-240C. Arab Historians.
- 250A-250B-250C. Seminar in Arabic Literature.
- 596. Directed Individual Study.
- 597. Examination Preparation.
- 599. Dissertation Research and Preparation.

**Armenian 210. History of the Armenian Language.**

- 220. Armenian Literature of the Golden Age. (A.D. 5th Century)
- 250A-250B. Seminar in Armenian Literature.
- 280. Seminar in Armenia Historiography.
- 596. Directed Individual Study.
- 597. Examination Preparation.
- 599. Dissertation Research and Preparation.

**Art 210. Egyptian Art.**

- 213. Problems in Islamic Art.
- 223. Classical Art.
- 225. Medieval Art.
- 226A-226B. Medieval Art and Architecture.
- 260. Asian Art.

**Berber 201. Berber Structure.****Classics. Greek 231A-231B-231C. Seminar in Patristic and Byzantine Literature.**

- 232. Studies in the History of Classical Scholarship of the Byzantine Period.

**French 221A. Introduction to the Study of the French-African Literatures.**

- 221B. French-African Literature of Madagascar and Bantu Africa.

**221C. French-African Literature of Berbero-Sudanese and Arabo-Islamic Africa.****257A-257B. Studies in French-African Literature.****Geography 288. Africa.**

- 290H. Middle East.
- 290I. Northern Africa.

**Hebrew.\*****History 201A. History of the Eurasian Nomadic Empires.****203. History of Ancient Egypt in the Late Period.****204A-204B. History of the Church in the Middle Ages.****207. Armenian Intellectual History.****209A-209B. The Modern Middle East.****210A-210B. Morocco and Europe to the End of the French Protectorate.****211A-211B-211C. Islamic Iran.****230J. Advanced Historiography. The Near East.****230R. Advanced Historiography. Jewish History.****240J. Topics in History. The Near East.****240R. Topics in History. Jewish History.****240S. Topics in History: Armenian History.****252A-252B-252C. Seminar in Byzantine History.****267A-267B. Seminar in Near Eastern History.****268A-268B. Seminar in Jewish History.****282A-282B. Seminar in the History of Religions.****283A-283B. Seminar in Ottoman and Modern Turkish History.****284A-284B. Seminar in the Social History of the Middle East.****285A-285B. Seminar in Armenian History.****596. Directed Studies.****597. Directed Studies for Graduate Examinations.****599. Doctoral Research and Writing.****Islamic 596. Directed Individual Study.****597. Examination Preparation.****598. Thesis Research and Preparation.****599. Dissertation Research and Preparation.****Linguistics 220A. Linguistic Areas. Africa.****225M. Linguistic Structures: Berber.****Near Eastern Languages 200A. Bibliography and Method of Near Eastern Languages and Literatures.**

† See Linguistics Department for complete listing and detailed description.

\* See Department of Near Eastern Languages for complete listing and detailed description.

241. Folklore and Mythology of the Near East.  
 290. Seminar in Paleography.  
 596. Directed Individual Study.  
 597. Examination Preparation.  
 599. Dissertation Research and Preparation.
- Persian** 220A–220B. Classical Persian Texts.  
 250. Seminar in Persian Literature.  
 596. Directed Individual Study.  
 597. Examination Preparation.
- Political Science** 250F. Seminars in Regional and Area Political Studies. Middle Eastern Studies.  
 250K. North African Studies.
- Semitics** 201A–201B–201C. Old Ethiopic.  
 202A–202B–202C. Readings in Old Ethiopic Literature.  
 209A–209B–209C. Comparative Study of the Ethiopian Languages.  
 210A–210B. Ancient Aramaic.  
 215A–215B–215C. Syriac.
- 220A–220B–220C. Ugaritic.  
 240. Seminar in Akkadian Language and Literature.  
 280A–280B–280C. Seminar in Comparative Semitics.  
 290A–290B–290C. Comparative Morphology of the Semitic Languages.  
 596. Directed Individual Study.  
 597. Examination Preparation.  
 599. Dissertation Research and Preparation.
- Sociology** 236. Social Change in the Middle East.  
 237. Social Stratification in the Middle East.
- Turkic Languages** 210A–210B–210C. Ottoman.  
 211. Ottoman Diplomatics.  
 596. Directed Individual Study.  
 597. Examination Preparation.  
 599. Dissertation Research and Preparation.

## ■ ITALIAN

(Department Office, 340 Royce Hall)

Giovanni Cecchetti, Dottore in Lettere, *Professor of Italian (Chairman of the Department)*.

Fredi Chiappelli, Dottore in Lettere, *Professor of Italian*.

Pier-Maria Pasinetti, Ph.D., *Professor of Italian*.

Charles Speroni, Ph.D., *Professor of Italian*.

Margherita Cottino-Jones, Ph.D., *Associate Professor of Italian*.

Luigi Ballerini, Dottore in Lettere, *Assistant Professor of Italian*.

Franco Betti, Ph.D., *Assistant Professor of Italian*.



Mirella Cheeseman, Dottorato Università di Napoli, *Lecturer in Italian*.

Althea Soli, M.A., *Lecturer in Italian*.

### Preparation for the Major

Courses 1, 2, 3, 4, 5, 8A, 8B, 8C.

### The Major

Required: at least 15 upper division courses as follows: 101A, 101B, 101C, 102, 103A, 103B, 103C, 113A, 113B, 113C, 120 and a choice of two courses between 116A, 116B and 119A, 119B. Strongly recommended: History 148A, 148B; Art 106A, 106B, 106C; upper division courses in another literature, philosophy or fine arts, one course in a second language (Latin, French, Spanish or German) at least at level 3.

### Requirements for the Master's Degree

*General Requirements.* See pages 153–154. The Department favors the Comprehensive Examination Plan, but, with departmental approval, the Thesis Plan may be followed. See page 155.

*Departmental Requirements.* Thesis Plan. The preparation and examination of each candidate will be the responsibility of a guidance committee composed of three members of the Department. The chairman of the committee will be the instructor under whom the candidate proposes to write his thesis. No committee shall be appointed before a candi-

date has completed two full quarters of work in graduate standing in the Department.

1. Foreign Language. The same as for the Comprehensive Examination Plan.

2. Courses. Nine courses of which a minimum of six must be in the 200 series.

3. Thesis and Examination. The subject and general plan of investigation for the thesis must be approved by the Department and the instructor concerned before a guidance committee can be appointed. After completion of the thesis, the candidate must pass a two-hour oral examination testing his knowledge of the field of his thesis and his general competence. Only those students who attain a 3.5 grade-point rating in the examination will be encouraged to proceed to candidacy for the Ph.D. degree.

*Departmental Requirements. Comprehensive Examination plan.*

1. Foreign Language. A reading knowledge of one other foreign language approved by the graduate adviser. This requirement must be met at least one quarter before the date of the comprehensive examination.

2. Courses. Twelve courses, nine of which must be distributed as follows: Three in the Medieval period, three in the Renaissance and Baroque periods, and three in the Modern period (from the 18th to the 20th century). Italian 201 and at least one quarter of Italian 205 are required. Related courses in other Departments, such as History 205A and 205B and Art 230 are strongly recommended. The Department will inform students at the beginning of each academic year as to the immediate availability of the latter.

3. The Comprehensive Examination. One four-hour written examination to be given the next to the last week preceding the final examination period of the fall and spring quarters. After the written examination, at the discretion of the Department, the candidate may be required to take an oral examination.

#### Requirements for the Ph.D. Degree in Italian

*General Requirements. See page 156.*

*Departmental Requirements.*

1. Foreign Language. A student normally will pass this requirement by giving evidence of successful completion of courses through at least level 3 in Latin, French, and either German or Spanish (subject to departmental approval). Students may also pass a reading examination in French, German, or Spanish. All language requirements must be fulfilled

prior to taking the qualifying examinations. Qualifying examinations will be given in the second week of the fall and spring quarters.

2. Required Courses. In addition to those required for the master's degree, or equivalent: at least ten other quarter courses, six of which must be seminars. In addition, the student will take such courses as his guidance committee will prescribe in preparation for the qualifying examinations, such as 596, 597, 599.

3. Fields of Specialization. The Department recognizes the following fields of specialization, from which one major and two minor fields will be selected. Medieval, Renaissance and Baroque, Modern.

4. Qualifying Examinations. Part I. An M.A. in Italian from UCLA is accepted as Part I of the Ph.D. qualifying examinations. Graduate students entering the Ph.D. Program in Italian with an M.A. from another University will take Part I at the end of their first graduate year at UCLA. This qualifying examination Part I is similar to the comprehensive examination for the M.A. (see page 155).

5. Qualifying Examinations. Part II. The qualifying examinations will consist of: one four-hour written examination in the candidate's major field; one four-hour written examination covering the two minor fields; a two-hour oral examination. The qualifying examinations are normally taken no later than nine quarters after the B.A. and six quarters after receiving the M.A.

6. The Dissertation. The dissertation should be presented within a period of three years after formal advancement to candidacy for the degree. After the acceptance of the dissertation in its final form, the candidate is required to take an oral examination which will cover principally the field within which the dissertation falls.

#### Lower Division Courses

##### 1. Elementary Italian—Beginning.

Sections meet five hours weekly.

The Staff

##### 2. Elementary Italian—Continued.

Sections meet five hours weekly. Prerequisite: course 1 or one year of high school Italian.

Mrs. Cheeseman in charge

##### 3. Elementary Italian—Continued.

Sections meet five hours weekly. Prerequisite: course 2 or two years of high school Italian.

Mrs. Cheeseman in charge

##### 4. Intermediate Italian.

Sections meet five hours weekly. Prerequisite: course 3 or three years of high school Italian.

The Staff

**5. Intermediate Italian.**

Sections meet five hours weekly. Prerequisite: course 4 or four years of high school Italian.

The Staff

**6. Intermediate Italian.**

Section meet five hours weekly. Prerequisite: course 5.

The Staff

**8A-8B-8C. Italian Conversation. (½ course each)**

Sections meet two hours weekly. Prerequisite: for 8A, course 1; for 8B, course 2; for 8C, course 3.

Mrs. Soli in charge

**25. Advanced Italian.**

Sections meet five hours weekly. Prerequisite: course 6. A preparatory course for Italian composition.

**Upper Division Courses**

Twenty-four quarter units in Italian or the equivalent are required for admission to any upper division course. Upper division courses will be conducted mainly in Italian.

**101A-101B-101C. Grammar and Composition.**

Classes meet four hours weekly.

The Staff

**102. Italian Culture and Institutions.**

Class meets four hours weekly. Aspects and trends of the Italian historical and cultural development studied in specific examples.

The Staff

**103A-103B-103C. Survey of Italian Literature.**

Classes meet three hours weekly. An introduction to the principal authors, works and movements of Italian Literature.

Mr. Betti

**113A-113B-113C. Dante's "Divina Commedia."**

Classes meet three hours weekly.

113A. Inferno.

113B. Purgatorio.

113C. Paradiso.

The Staff

**114A-114B. Italian Literature of the Middle Ages.**

Classes meet three hours weekly. Emphasis on "Stil Novo," Dante's minor works, Petrarch and Boccaccio.

Mrs. Cottino-Jones

**116A-116B. Italian Literature of the Renaissance.**

Classes meet three hours weekly. Emphasis on Lorenzo De'Medici, Poliziano, Castiglione, Machiavelli, Ariosto, Tasso.

Mr. Betti

**118. Italian Literature of the Eighteenth Century.**

Class meets three hours weekly. Emphasis on Goldoni, Parini, Alfieri.

Mr. Pasinetti

**119A-119B. Italian Literature of the Nineteenth Century.**

Classes meet three hours weekly. Emphasis on Foscolo, Leopardi, Manzoni.

Mr. Pasinetti

**120. Italian Literature of the Twentieth Century.**

Class meets three hours weekly. From Verga to Contemporaries.

Mr. Betti

**130. Advanced Grammar and Composition.**

Class meets three hours weekly. Prerequisite: course 101C.

Mrs. Cottino-Jones

**131. Reading and Reciting. (½ course)**

Prerequisite: Consent of the instructor based on sufficient knowledge of the language.

Mrs. Soli

**190. Pre-Seminars in Italian Literature. (½ course)**

The Staff

**199. Special Studies. (½ course)**

The Staff

**Service Courses**

No knowledge of Italian is required for these courses. No credit is given toward the major.

**16. Special Reading Course. (No credit)**

Class meets three hours weekly. Mainly designed for graduate students in other areas.

The Staff

**26. Special Reading Course. (No credit)**

Class meets three hours weekly. Mainly designed for graduate students in other areas.

The Staff

**100A-100B-100C. Italian Literature in Translation.**

Classes meet three hours weekly.

100A. The Middle Ages.

100B. The Renaissance and Baroque.

100C. From Vico to the 20th Century. Mr. Betti

**110A-110B. The Divine Comedy in English.**

Classes meet three hours weekly.

**140. Readings in the Italian Theatre in Translation.**

Class meets three hours weekly.

**150. Modern Italian Fiction in Translation.**

Class meets three hours weekly.

The Staff

**Graduate Courses****201. Bibliography and Methods of Research.**

Course meets two hours weekly.

Mrs. Cottino-Jones

**205A-205B. Methods of Literary Criticism.**

Classes meet two hours weekly.

205A. Brief History of Literary Criticism.

205B. Discussion of Modern Critical Approaches.

Mrs. Cottino-Jones

**210A-210B-210C. Early Italian Literature.**

Classes meet two hours weekly.

210A. The Origins of Italian Language and Early Texts.

210B. The *Scuola Siciliana* and Early Poetry in Central and Northern Italy.

210C. The *Dolce stil novo*. Mr. Chiappelli

**214A-214G. Italian Literature of the Fourteenth Century.**

Classes meet three hours weekly.

214A. Dante's *Vita Nuova* and *Rime*.

Mr. Chiappelli

214B. *Convito* and *De Vulgari Eloquentia*.

Mr. Chiappelli

214C. The *Commedia* and the *Monarchia*.

Mr. Chiappelli

214D. Petrarca.

Mrs. Cottino-Jones

214E. The *Decameron*.

Mr. Betti

214F. Boccaccio's Other Works.

Mrs. Cottino-Jones

214G. Sacchetti and Other Prose Writers.

Mr. Chiappelli



**215A-215B-215C. Italian Literature of the Fifteenth Century.**

Classes meet three hours weekly.

215A. Fiction and Other Prose Texts.

Mr. Chiappelli

215B. Writings of the Humanists. Mr. Cecchetti

215C. The Age of Lorenzo de' Medici and Poliziano. Mrs. Cottino-Jones

**216A-216E. Italian Literature of the Sixteenth Century.**

Classes meet three hours weekly.

216A. Machiavelli.

Mr. Chiappelli

216B. Ariosto.

Mr. Betti

216C. Bembo, Folengo, Aretino, and the Theatre.

Mr. Cecchetti

216D. Prose (Castiglione, Della Casa, Guicciardini, Cellini).

Mr. Ballerini

216E. Tasso.

Mr. Betti

**217A-217B-217C. Italian Literature of the Seventeenth Century.**

Classes meet three hours weekly.

217A. Bruno, Campanella, Galilei, Magalotti.

Mrs. Cottino-Jones

217B. Commedia dell'arte and the Theatre.

Mr. Ballerini

217C. Marino and Marinisti. Mrs. Cottino-Jones

**218A-218E. Italian Literature of the Eighteenth Century.**

Classes meet three hours weekly.

218A. The Prose from Vico to Cesarotti. Mr. Betti

218B. Essayists and Autobiographical Writers.

Mr. Betti

218C. The Theater, Especially Metastasio, Goldoni, C. Gozzi.

Mr. Pasinetti

218D. Parini and the Poets of Arcadia.

Mr. Ballerini

218E. Alfieri.

Mr. Chiappelli

**219A-219F. Italian Literature of the Nineteenth Century.**

Classes meet three hours weekly.

219A. Foscolo.

Mr. Chiappelli

219B. Leopardi.

Mr. Cecchetti

219C. Manzoni.

Mr. Pasinetti

219D. Trends in Fiction before Verga. Mr. Betti

Mr. Betti

219E. Verga.

Mr. Cecchetti

219F. Italian Literature at the Turn of the Century.

Mr. Ballerini

**220A-220B-220C. The Italian Literature of the Twentieth Century.**

Classes meet three hours weekly.

220A. From D'Annunzio to Futurism and the Early Twenties. Mr. Ballerini

220B. Contemporary Italian Poetry. Mr. Cecchetti

220C. Contemporary Italian Fiction. Mr. Ballerini

**230A-230B. Folk Tradition in Italian Literature.**

(Same as Folklore 230A-230B.) Course meets two hours weekly. Mr. Speroni

Seminars

**250A-250D. Seminar on Dante.**

Course meets three hours weekly.

Mrs. Cottino-Jones

**251. Seminar on Petrarch.**

Course meets three hours weekly.

Mrs. Cottino-Jones

**252. Seminar on Boccaccio.**

Course meets three hours weekly.

**253A-253B-253C. Seminar on Chivalric Poetry in Italy.**

Course meets three hours weekly. The relationship between the genre and its French medieval sources, with a study of its evolution in Italy, through Pulci, Boiardo, Ariosto, and Tasso.

Mr. Speroni

**254. Seminar on Machiavelli.**

Course meets three hours weekly.

**255A-255B. Seminar on the Baroque.**

Course meets three hours weekly.

Mrs. Cottino-Jones

**256A-256B. Seminar on the Eighteenth Century.**

Course meets three hours weekly.

Mr. Pasinetti

**257A-257B. Seminar on Romanticism.**

Course meets three hours weekly.

Mr. Pasinetti

**258A-258B. Seminar on Contemporary Italian Literature.**

Course meets three hours weekly.

**259. Studies in Early Italian Language.**

**370. Problems and Methods in the Teaching of Italian.**

Course meets two hours weekly

The Staff

Individual Study and Research

**596. Directed Individual Studies. (1 to 2 courses)**

The Staff

**597. Preparation for Comprehensive Examinations. (1 to 2 courses)**

The Staff

**599. Doctoral Research and Writing. (1 to 2 courses)**

The Staff

**JOURNALISM**

(Department Office, 55C Social Welfare Building)

William W. Johnson, M.A., *Professor of Journalism.*

Walter Wilcox, Ph.D., *Professor of Journalism.*

Joseph A. Brandt, M.A. (Oxon.), B.Litt. (Oxon.), LL.D., *Emeritus Professor of Journalism*.

Robert E. G. Harris, M.A., *Emeritus Professor of Journalism*.

Jack Lyle, Ph.D., *Associate Professor of Journalism*.

John M. Smith, M.A., *Assistant Professor of Journalism*.



Maury Green, B.A., *Lecturer in Journalism*.

James H. Howard, M.A., *Lecturer in Journalism*.

David M. Noyes, *Lecturer in Journalism*.

Kenneth O. Smith, Ed.D., *Lecturer in Journalism*.



Frank LaTourette, B.A., *Assistant Professor of Theater Arts*.

UCLA's Department of Journalism is a professional department dedicated to the continuing improvement of the news media through the training of journalists and teachers and through research. The master of journalism (M.J.) degree program is provided for students planning professional careers in the news media and related agencies such as news gathering associations and public information offices. The master of arts (M.A.) degree is primarily for those preparing for college-level teaching careers.

Because of the increasing complexity of the world today, the Department's faculty feels that journalists, more than ever, must have a solid basic education. For this reason, prospective students are encouraged to take undergraduate majors in substantive fields. Further, the graduate curriculum allows opportunity for students to take electives in substantive fields if they wish to prepare for specialized reporting careers. The Department does not offer an undergraduate major or minor. Certain courses, however, are open to undergraduate students as electives (see "Undergraduate Courses" below).

Reflecting their commitment to the improvement of news communication, faculty members are engaged in research on various communication problems. Effort is made to relate this research to the instructional program so that students can have the benefit of it in their career work.

A department application for admission is required in addition to the application filed with the Graduate Division. Forms are available from the Department of Journalism.

#### **Master of Journalism Degree**

The M. J. program emphasizes instruction and practice in the writing and processing of news and introduces students to the procedures and tools of the various news media. The content is contained in the three re-

quired professional courses, J-400, 401 and 402. Opportunity is provided in this series for a specialization in newspaper, magazine or broadcast journalism. This specialization is carried into the student's internship in the spring quarter.

Coordinated with this pragmatic emphasis are three required academic courses. These are intended to impress upon students the importance of the news media to society and the responsibility which rests upon those entering the field. J-201 (Structure of the News Media) examines the structure of the mass media and their relation to contemporary society together with consideration of ethical problems. J-274 (Theories of Mass Communication) introduces students to the theories and methods of communication research and presents a survey of findings pertaining to media, communicators and audiences. J-281 (Law of Mass Communication) provides a basic foundation of law and actions of regulatory agencies as they pertain to the mass media.

A minimum of three electives may be chosen from other courses in the Department's curriculum or from other fields with the approval of the Graduate Advisor.

All M.J. candidates are required to satisfactorily complete a depth-reporting project as a demonstration of professional competence. This project fulfills the University's requirements for a comprehensive examination.

#### **Master of Arts Degree**

Students in the M. A. program are required to take J-201, J-274, J-275 (Research Methods in the Mass Media) and J-281 plus the 400 series (unless waived). A minimum of two electives may be chosen from other courses in the Department's curriculum or from other fields with the approval of the Graduate Advisor.

In addition, M.A. candidates must meet University requirements concerning the master's thesis and foreign language proficiency.

The thesis topic must be approved by the Graduate Advisor who will assist the candidate in forming a thesis committee consisting of three faculty members. Supervision and final approval of the thesis is vested in this committee.

Foreign language examinations are administered by the Graduate Division. (Special review courses are available for most European languages, but it should be noted that these courses do not carry credit.) The Department does provide the option of substituting course work in research methodology for the foreign language. Students interested in this option should check with the Graduate Advisor.

### Undergraduate Courses

The Department offers a variety of undergraduate courses, primarily upper division courses provided as a service to students in the College of Letters and Science and the College of Fine Arts. These courses are intended to contribute to the general education of the student. In exceptional cases, undergraduates may be admitted to certain graduate courses with approval of the instructor. Undergraduates who wish advice concerning graduate programs and/or careers are invited to contact the Graduate Advisor.

#### Lower Division Course

### 2. Fundamentals of Journalism.

Lectures, field trips, and workshops. Survey of journalism principles and techniques.

#### Upper Division Courses

#### 101A. Reporting.

Fundamentals of the news communication process.  
Mr. Howard

#### 101B. Non-Verbal Reporting.

Basic graphic arts illustration, and photo-journalism, for the mass media.  
Mr. Smith

#### 112. The History of American Journalism.

History of the news media and their ancillary agencies with special attention to the news and information function. Course emphasizes historical context, including the main forces in development of the free press and social responsibility concepts.

#### 100. Radio and Television News.

Lecture, two hours; laboratory, three hours. Prerequisite: course 2 or equivalent. Fundamentals of broadcast news; FCC regulations; network, station, and news agency problems and policies. Laboratory: exercises and experiments in preparing the newscast, with emphasis on television.

#### 181. Reporting of Public Affairs.

Prerequisite: course 2 or equivalent. Reporting governmental functions with emphasis upon judicial, legislative and administrative procedures at the city and county level.

#### 182A. Magazine Writing.

Analysis of the general magazine. Writing non-fiction articles: research, style and structure.

#### 182B. Magazine Writing.

Continuation of course 182A. Prerequisite: course 182A or equivalent and consent of the instructor.

#### 183. Fundamentals of Public Relations.

Analysis of institutional policy, definition of publics, attitudes measurement, communications and evaluation of results; functional and ethical considerations.

#### 190. The Foreign Press.

Analysis of the four theories of the press; study of the flow of international news; analysis of the foreign media including problems of propaganda, governmental control, language and economic support.

#### 192. The Media of Mass Communications.

Institutional analysis of the mass media with emphasis upon the press and broadcasting in the mass communications process; interaction with other institutions; critical evaluation.

#### 195. The Critical Function of the Press.

Analysis and evaluation of the press in its role as critic of the popular arts, including television, books and motion pictures. Special lectures by professional critics.

#### Graduate Courses

#### 201. Structure of the News Media.

Organization, structure and operation of the news media, including present trends and projections.

#### 204. Ethics and Responsibility in Mass Communications.

Critical evaluation of the mass media with respect to ethical practices and responsibility. Required for the master's degree.

#### 207. Visual Arts in Mass Communication.

Course is designed to make students visually literate. Experimentation and research in visual images as a means of communication: perception, optics, typography; characteristics of mechanical and photo-electric reproduction; principles of layout, design, composition, visual continuity.

#### 210. Advanced Graphic Arts in Mass Communications.

Prerequisite: course 207. Advanced concepts in graphic communications, including computer-based systems. Emphasis on experimentation and review of research literature. Analysis of experimental graphic techniques will include examination of their social implications.

#### 252. Seminar in Editing the Newspaper.

Study of editing problems with some emphasis upon role of special editorial divisions (urban, finance, science, etc.); guest lecturers.

**253. Seminar in the History of Mass Communications.**

Study of the historical trends in the development of the mass media.

**260. Seminar in Issues in the News.**

Relates significant writing and the main trends in modern social, economic, and political history to the contemporary newsworthy issues.

**268. The Reporter and Society.**

Study of media performance in relation to main forces in the contemporary cultural pattern; emphasis upon the role of interpretive reporting. Required for the master's degree.

**274. Theories of Mass Communications.**

Study of mass communications process in terms of source, message, medium, context, audience, and response. Required for the master's degree.

**275. Mass Communications Research.**

Theory and techniques of mass communications research methods.

**281. Laws of Mass Communications.**

Basic laws affecting the press; First and Fourteenth Amendments; laws on libel, copyright, postal regulations and sedition; special laws on broadcasting; legal aspects of freedom of information.

**282. Seminar in Magazine Journalism.**

Analysis of dominant techniques in writing for American news and special quality magazines, emphasizing story structure and unique reporting methods; influence of nationally circulated news magazines on newspaper journalism.

**290. Seminar in International and Comparative Journalism.**

Investigative studies of newspapers now publishing in selected countries—their performance, goals, and influence are analyzed against the background of international affairs.

**291. Seminar in the Law of Mass Communications.**

Provides a framework for in-depth studies of changing concepts in laws affecting the mass media.

**295. Journalism as Literature.**

Studies of the interaction between journalism and literature since the 18th century, with an emphasis on style, literary trends, writer experience, and other influences.

**Professional Courses****400A. News Communication I.**

Laboratory and field work in newspaper journalism.

**400B. TV News Communication I.**

Television news communication.

**401A. News Communication II.**

Prerequisite: course 400A. Continuation of News Communication I.

**401B. TV News Communication II.**

Prerequisite: course 400B. Continuation of TV News Communication I.

**402A. News Communication III.**

Prerequisite: course 401A. Continuation of News Communication I and II. Internship.

**402B. TV News Communication III.**

Prerequisite: course 401B. Continuation of News Communication I and II.

**410A. Workshop in the Documentary Film.**

Prerequisite: admission to the television documentary film program in the Department of Journalism. Selection of a feasible subject for a documentary film, research and script preparation.

**410B. Documentary Film Workshop and Internship.**

Prerequisite: course 410A. Documentary film production by selected students or TV news internships in the Los Angeles area.

**Individual Study and Research****596. Directed Individual Studies in Mass Communications. (¼ to 2 courses)****598. Directed Research Relative to Preparation of Master's Thesis. (¼ to 1 course)****■ LATIN AMERICAN STUDIES****Curriculum in Latin American Studies**

For details of the curriculum leading to the degree of Bachelor of Arts, see page 75 of this bulletin.

**Master of Arts in Latin American Studies**

*Committee in charge.* Johannes Wilbert, Anthropology (Chairman); Charles F. Bennett, Geography; John E. Englekirk, Spanish and Portuguese.

The degree of Master of Arts in Latin American Studies is designed to provide systematic advanced training for (1) those planning to enter business or government service

in the Latin American field and (2) those in a specified academic discipline who have a regional interest in Latin America.

**Requirements for the Master's Degree**

*General Requirements.* See pages 153–154.

*Preparation.* The degree of Bachelor of Arts in Latin American Studies, or its equivalent, constitutes the preparation for admission. In exceptional cases graduate students with other backgrounds may be admitted at the discretion of the committee, but may be required to complete additional course work to correct deficiencies in preparation.

**Language Requirement.** Reading and speaking proficiency in Spanish and Portuguese are required. In certain cases a major Indian language (i.e. Quechua or Nahuatl) may be substituted for the latter.

Normally the thesis plan is followed. The thesis is required of all students intending to continue beyond the M.A. in Latin American Studies to a Ph.D. in a particular discipline (no Ph.D. is offered in Latin American Studies). However, students planning to make the M.A. their terminal degree have the option of completing their degree requirements with a comprehensive examination.

**Course Requirements.** Ten courses with Latin American content chosen from the humanities, social sciences or professions. The Interdisciplinary Seminar in Latin American Studies (250A-250B), required of all M.A. candidates, counts as two of these major courses. Further, a student whose seminar project is approved for field work leading to the thesis will be permitted to count his quarter of field work as one course within the major field. The optional comprehensive examination plan for terminal M.A. degree candidates requires a major in one discipline and a minor in another, both with Latin American content.

Normally all work toward the M.A. degree must be completed within five consecutive quarters. Potential doctoral candidates doing field work after participation in the Interdisciplinary Seminar must complete their M.A. in seven consecutive quarters.

#### Graduate Courses

#### 200. Latin American Research Resources.

(½ course)

The course will acquaint students with general and specialized materials in fields concerned with Latin American Studies. Library research techniques will provide the experience and competency required for future bibliographic and research sophistication as the basis for enhanced research results.

#### 250A-250B. Interdisciplinary Seminar in Latin

##### American Studies.

Required of all candidates for the master's degree in Latin American studies. Problem-oriented on critical areas stressed in the University's cooperative programs in Latin America. Preparation of thesis and field study. Mr. Furst, Mr. Wilbert, Mr. Wilkie

#### Related Courses

**Anthropology 107.** Peoples of South America.

109. Indians of Modern Mexico and Peru.

117. Introduction to Nahuatl Language and Literature.

121. Latin American Societies.

133A. Ancient Civilizations of Western Middle America (Nahuatl Sphere).

133B. Ancient Civilizations of Eastern Middle America (Maya Sphere).

134. Ancient Civilizations of Andean South America.

199. (When concerned with Latin America.)

207. Indians of South America.

214B. Linguistic Areas: Aboriginal South America.

257. Indians of South America.

264. Problems of Higher Cultures of Nuclear America.

265. Contemporary Latin American Problems.

271. Selected Topics in Historical Reconstruction and Archaeology. (When concerned with Latin America.)

272. Selected Topics in Prehistoric Nonagricultural Societies. (When concerned with Latin America.)

274. Selected Topics in Prehistoric Civilizations of the New World.

596. (When concerned with Latin America.)

**Architecture and Urban Planning 214.** Urbanization in National Development. (When concerned with Latin America.)

**Art 118B.** The Arts of Pre-Columbian America.

198. (When concerned with Latin America.)

**Business Administration 297A.** Comparative and International Management. (When concerned with Latin America.)

297B. International Business Policy. (When concerned with Latin America.)

**Dance 146.** Dance in Latin America.

171J. Dance of Mexico.

**Economics 110.** Economic Problems of Underdeveloped Countries.

111. Theories of Economic Growth and Development.

112. Policies for Economic Development.

199. (When concerned with Latin America.)

211. Economic Growth of Underdeveloped Areas: Theory and Structure.

212. Economic Growth of Underdeveloped Areas: Models and Policy.

- 213D. Selected Problems of Underdeveloped Areas: Latin America.  
596. (When concerned with Latin America.)
- Education** 199. (When concerned with Latin America.)  
204D. Latin American Education.  
253D. Seminar: Latin American Education.
- Folklore** 248. Theory and Method in Latin American Studies. (Taught in Spanish.)
- Geography** 181. Middle America.  
182. South America.  
199. (When concerned with Latin America.)  
225. Seminar in Cultural Geography. (When concerned with Latin America.)  
281. Latin America.  
290B. Seminar in Regional Geography: Middle America.  
290C. Seminar in Regional Geography: South America.  
596. (When concerned with Latin America.)
- History** 162A-162B. Latin America in the 19th and 20th Centuries.  
163A-163B. The History of Brazil.  
166. The Mexican Revolution.  
168A-168B. Colonial Latin America.  
169. Diplomatic History of Latin America.  
199. (When concerned with Latin America.)  
230I. Advanced Historiography: Latin America.  
240I. Topics in History: Latin America.  
266A-266B. Seminar in Latin American History.  
596. (When concerned with Latin America.)
- Law** 233. Comparative Law: Latin America.
- Music** 131. Music of Latin America.  
171J. Music and Dance of Mexico.  
259. Seminar in Music of Latin America.
- Political Science** 131. Latin American International Relations.  
139. Special Studies in International Relations. (When concerned with Latin America.)  
168A-168B. Government and Politics in Latin America.
169. Special Studies in Comparative Government. (When concerned with Latin America).  
199. (When concerned with Latin America.)  
225. Selected Topics in Comparative Government. (When concerned with Latin America.)  
229. Urban Government. (When concerned with Latin America.)  
230. Comparative Development Administration. (When concerned with Latin America.)  
250A. Latin American Studies.  
256. Seminar in Comparative Government. (When concerned with Latin America.)  
596. (When concerned with Latin America.)  
598. (When concerned with Latin America.)
- Portuguese** 101A. Advanced Reading and Conversation.  
121A-121B. Survey of Brazilian Literature.  
131. The Brazilian Novel.  
133. Brazilian Poetry.  
199. (When concerned with Brazil.)  
203. The Development of the Portuguese Language.  
236. Modern Brazilian Novel.  
253B. Studies in Luso-Brazilian Literature: Brazilian Authors.  
596. (When concerned with Latin America.)  
290E. Special Group Studies: International Health.
- Sociology** 131. Latin American Societies.  
199. (When concerned with Latin America.)
- Public Health** 161. Demography.  
216A. Infectious Diseases in Tropical Regions.  
233. Change Determinants in Health-Related Behavior.  
245A. Research Methods in Community Health.  
249A-B. Sociocultural Problems of Health and Illness.  
256A-B-C. Seminar in Comparative and International Health.
- Spanish** 118. History of the Spanish and Portuguese Languages.

- 121A-121B. Survey of Spanish American Literature.
137. The Literature of Colonial Spanish America.
139. Nineteenth Century Spanish American Literature.
143. Spanish American Literature in the Twentieth Century.
149. Folk Literature of the Hispanic World.
151. Folk Song in Spain and Spanish America.
- 160B. Hispanic Literature in Translation (Latin America).
199. (When concerned with Latin America.)
203. The Development of the Spanish Language.
209. Dialectology.
237. Chroniclers of the Americas.
239. Neo-Classic and Romantic Prose and Poetry in Spanish America.
240. The Modernist Movement.
243. Contemporary Spanish American Poetry.
244. Contemporary Spanish American Novel and Short Story.
245. Contemporary Spanish American Essay.
249. Hispanic Folk Literature.
- 256B. Studies in Dialectology.
277. Studies in Colonial Spanish American Literature.
278. Studies in Nineteenth Century Spanish American Literature.
- 280A-280D. Studies in Contemporary Spanish American Literature.
- 286B. Studies in Hispanic Folk Literature: Narrative and Drama.
- 286C. Studies in Hispanic Folk Literature: Ballad, Poetry and Speech.
596. (When concerned with Latin America.)
598. (When concerned with Latin America.)

## ■ LAW

(Department Office, 1224 Law Building)

Benjamin Aaron, A.B., LL.B., *Professor of Law and Director of the Institute of Industrial Relations.*

†Norman Abrams, A.B., J.D., *Professor of Law.*

Michael R. Asimow, B.S., LL.B., *Professor of Law.*

John A. Bauman, B.S.L., LL.B., LL.M., Jur.Sc.D., *Professor of Law.*

L. Dale Coffman, A.B., J.D., LL.M., S.J.D., *Professor of Law.*

Jesse J. Dukeminier, Jr., A.B., LL.B., *Professor of Law.*

Kenneth W. Graham, Jr., B.A., J.D., *Professor of Law.*

†Donald G. Hagman, B.S., LL.B., LL.M., *Professor of Law.*

Harold W. Horowitz, A.B., LL.B., LL.M., S.J.D., *Professor of Law.*

Edgar A. Jones, Jr., A.B., LL.B., *Professor of Law.*

Kenneth L. Karst, A.B., LL.B., *Professor of Law.*

†Leon Letwin, Ph.B., LL.B., *Professor of Law.*

Wesley J. Liebeler, B.A., J.D., *Professor of Law.*

†Richard C. Maxwell, B.S.L., LL.B., *Professor of Law.*

David Mellinkoff, A.B., LL.B., *Professor of Law.*

†Herbert Morris, A.B., LL.B., D.Phil. (Oxon.), *Professor of Law and Philosophy.*

Addison Mueller, A.B., LL.B., *Professor of Law.*

Melville B. Nimmer, A.B., LL.B., *Professor of Law.*

Monroe E. Price, B.A., LL.B., *Professor of Law.*

Paul O. Proehl, A.B., J.D., M.A., *Professor of Law.*

Ralph S. Rice, B.S., LL.B., LL.M., *Connell Professor of Law.*

Herbert E. Schwartz, B.S., LL.B., *Professor of Law.*

Murray L. Schwartz, B.S., LL.B., *Professor of Law (Chairman of the Department).*

† Absent on leave 1970-71.

James D. Sumner, Jr., A.B., LL.B., LL.M., J.S.D., *Professor of Law.*  
 William D. Warren, A.B., J.D., J.S.D., *Professor of Law.*  
 †Richard A. Wasserstrom, B.A., M.A., Ph.D., LL.B., *Professor of Law and Philosophy.*  
 Kenneth H. York, A.B., LL.B., *Professor of Law.*  
 Rollin M. Perkins, A.B., J.D., S.J.D., *Emeritus Connell Professor of Law.*  
 Harold E. Verrall, A.B., LL.B., M.A., J.S.D., *Emeritus Professor of Law.*  
 Barbara B. Rintala, B.A., M.A., J.D., *Professor of Law.*  
 Gary T. Schwartz, B.A., LL.B., *Professor of Law.*  
 Michael E. Tigar, B.A., J.D., *Professor of Law.*  
 ———, *Acting Professor of Law.*



Reginald H. Alleyne, Jr., B.Sc., LL.B., LL.M., *Acting Professor of Law.*  
 David A. Binder, A.B., LL.B., *Lecturer in Law.*  
 Reid Pevton Chambers, B.A., M.A., J.D., *Acting Professor of Law.*  
 George P. Fletcher, B.A., J.D., M.C.L., *Acting Associate Professor of Law.*  
 Martin H. Kahn, B.S., LL.B., M.A., *Lecturer in Law.*  
 James E. Krier, B.S., J.D., *Acting Professor of Law.*  
 Henry W. McGee, Jr., B.S., J.D., *Acting Professor of Law.*  
 Edward J. Owen, A.B., LL.B., *Lecturer in Charge of Legal Aid Instruction.*  
 Joel Rabinovitz, A.B., LL.B., *Acting Associate Professor of Law.*  
 Arthur I. Rosett, B.A., LL.B., *Acting Professor of Law.*  
 †Lawrence G. Sager, B.A., LL.B., *Acting Professor of Law.*  
 Thomas J. Scully, B.A., J.D., *Lecturer in Law.*  
 Laurens H. Silver, B.A., J.D., *Lecturer in Law.*  
 John M. Suarez, M.D., *Assistant Professor of Psychiatry.*

## ■ LIBRARY SERVICE

(Department Office, 326 Powell Library Building)

Harold Borko, Ph.D., *Professor of Library Service.*  
 Robert L. Collison, B.A., F.L.A., *Professor of Library Service.*  
 Robert M. Hayes, Ph.D., *Professor of Library Service.*  
 Andrew H. Horn, Ph.D., *Professor of Library Service (Chairman of the Department).*  
 Robert Vosper, M.A., LL.D., *Professor of Library Service.*  
 Seymour Lubetzky, M.A., LL.D., *Emeritus Professor of Library Service.*  
 Lawrence Clark Powell, Ph.D., Litt.D., L.H.D., *Emeritus Professor of Library Service.*  
 Raymond F. Wood, Ph.D., *Associate Professor of Library Service.*  
 C. Edward Evans, Ph.D., *Assistant Professor of Library Service.*  
 Raymond K. Olding, B.Ec., F.L.A.A., *Assistant Professor of Library Service.*  
 ———, *Assistant Professor of Library Service.*



Elizabeth R. Baughman, M.A., *Lecturer in Library Service.*  
 Robert L. Brubaker, M.A., *Acting Assistant Professor of Library Service.*  
 Marion K. Cobb, M.A., *Lecturer in Library Service.*  
 Jerome Cushman, A.B., B.S.L.S., *Senior Lecturer in Library Service and English.*  
 Chase Dane, A.B., M.S.L.S., *Lecturer in Library Service and Supervisor of Teaching in the School of Education.*  
 Louise Darling, M.A., *Lecturer in Library Service and Medical History.*  
 Guy H. Dobbs, *Lecturer in Library Service.*  
 J. M. Edelstein, M.A., *Lecturer in Library Service.*  
 Elizabeth R. Eisenbach, M.L.S., *Lecturer in Library Service.*

† Absent on leave 1970-71.



Everett T. Moore, M.A., *Lecturer in Library Service.*

Betty Rosenberg, M.A., *Lecturer in Library Service.*

Johanna E. Tallman, A.B., C.L., *Lecturer in Library Service and Engineering Bibliography.*

### **Representatives of Other Departments on the Faculty of the School of Library Service**

Hugh G. Dick, Ph.D., *Professor of English.*

B. Lamar Johnson, Ph.D., *Professor of Education.*

Michel A. Melkanoff, Ph.D., *Professor of Engineering.*

Richard H. Rouse, Ph.D., *Associate Professor of History.*

Gustave E. von Grunebaum, Ph.D., *Professor of History.*

For information regarding admission to the School of Library Service and for requirements for the degrees Master of Library Science, Master of Science in Information Science (Documentation), or the Certificate of Specialization in Library Science, refer to the paragraphs on the School of Library Service under Schools and Colleges.

Graduate students of other schools or departments who wish to take courses in the School of Library Service may do so with the permission of the instructor teaching the course. Undergraduate students who wish to enroll in 400-series courses must obtain the permission of the Dean of the School of Library Service.

**Graduate courses. 200-series.** Consent of instructor is prerequisite to admission to all 200-series courses. For individual study courses, see 500-series. For professionally oriented courses, see 400-series.

**Professional courses. 400-series.** Planned primarily for the professional degree, Master of Library Science, and for specialized professional study. Required for the M.L.S. degree are 400, 402, 404, 410, 411, 420, 421, 430 and four additional courses in the 200-, 400-, or 500-series selected with the approval of the candidate's faculty adviser.

**Professional internship courses. 490-series.** M.L.S. degree and consent of the Dean of the School of Library Service are prerequisite to admission. May not be applied in satisfaction of course requirements for a degree. Open to certificate candidates only.

**Individual study courses. 500-series.** Approval of the Dean of the School of Library Service is prerequisite to admission to all 500-series courses. Method of instruction is by individual conferences with assigned members of the staff. Seminar courses are numbered in the 200-series.

### **Graduate Courses**

#### **205. History of Library Technology.**

(Formerly numbered 213.) Seminar on the history of library techniques, methods, organization, equipment, architecture, legislation, and standards. Excluded is the traditional history of library founders, donors and collection development.

#### **207. Seminar on Comparative Librarianship.**

(Formerly numbered 240.) Library development and service patterns in European and other countries; comparisons of these with librarianship in the United States. Interlibrary cooperation between types of libraries and also between libraries of different political jurisdictions, including international cooperation.

#### **210. Descriptive and Bibliographical Cataloging.**

Bibliography and cataloging. Development of Anglo-American cataloging rules and international developments. Analysis of cataloging purposes, problems and principles. Evaluation of governing rules. Problems and potentialities of automation.

#### **211. Subject Cataloging and Comparative Classification.**

Bibliographic and subject control of collections. Subject headings and classification systems. Alphabetical and classed subject catalogs and indexes. Subject heading lists, thesauri, etc. D.C., U.D.C., Cutter, L.C., Bliss, Colon, and other classification systems. Automation of subject control.

#### **213. Seminar on Indexing.**

Prerequisite: consent of the instructor. Development of basic concepts as reflected in the history of scholarship. Current problems in the transition from individual to large-scale indexing projects. Contribution made by automation. Future of mechanized indexing. Trend toward international standardization. Acceleration systems in indexing.

#### **214. Seminar on Abstracting and Abstracting Services.**

Prerequisite: consent of the instructor. Historical background and current situation, particularly in science and technology. Possibilities and present limitations of automation. Role in coordination of information services. Problems of standardization to achieve international coordination. Influence of changing needs.

#### **215. Seminar on Cataloging and Classification.**

History of cataloging and classification and special problems in cataloging and classification.

**221. Bibliography of Science, Engineering and Technology.**

(Formerly numbered 217.) Scientific and technical literature, with emphasis on special types of publications, research material, reference and bibliographical aids to the physical sciences. Importance, purpose and nature of technical literature searches. Flow of information among scientists.

**222. Bibliography of the Medical and Life Sciences.**

(Formerly numbered 218.) Literature of the medical and life sciences; reference and bibliographical works; periodicals, serials and the abstracts and indexes to them; notable books in the history of the biomedical sciences; patterns of publication; applications of technological developments in the control of the biomedical literature.

**223. Literature of the Social Sciences.**

(Formerly numbered 219.) Seminar on the literature of the social sciences, including a review of the classics in the various fields, monumental source collections, periodicals, bibliographies, catalogs, indexes, abstracts, etc. Trends in scholarly and popular writing. Interdisciplinary nature of the literature.

**224. Literature of the Humanities and Fine Arts.**

(Formerly numbered 220.) Seminar on the literature of the humanities and fine arts, including a review of the classics in the various fields, comparisons of editions, periodicals, bibliographical apparatus and reviewing media. Trends in scholarly and popular writing.

**229A. Afro-American Bibliography.**

Prerequisite: consent of the instructor. Resources for the study of Afro-American history, culture and literature. Problems of identification, description, subject analysis. Bibliographical and reference apparatus.

**230. Publishing and the Book Trade.**

Publishing and book trade history, ancient to modern times, with particular reference to book collecting and libraries. Changing aspects of book production and distribution, emphasizing modern methods. Retail book trade, new and antiquarian; book auctions.

**240. Information Systems Analysis and Design.**

(Formerly numbered 243.) Theories and principles of special systems development, including determination of requirements, technical design and evaluation, and internal organization.

**241. Management Information Systems.**

Survey of information systems for the management of large scale projects and organizations, including systems for progress reporting, file control, and documentation.

**242. Information Retrieval Systems.**

Survey of principal specialized vocabularies, methods of file organization, and search strategies in the control of publications in mechanized form.

**243. Data Base Systems.**

Survey of methods for developing, implementing and operating mechanized data base systems such as socioeconomic data banks and technical data banks.

**249. Seminar in Information Science.**

(Formerly numbered 293.) Specialized studies in problem areas of information science: vocabulary development, representation coding, file organization and indexing, classification systems, searching procedures, measurement of relevancy, data reduction and presentation, and communication. May be repeated once for credit.

**251. Reading and Reading Interests.**

(Formerly numbered 215.) Interests of the common reader, excluding children, with special reference to types of library patrons. Fiction and subject categories, popular and standard: philosophy, religion, social sciences, art, music, literature, history, science. Influence of paperbacks, best sellers and current interest books on reading habits.

**253. Special Studies in Children's Literature.**

(Formerly numbered 209.) Special studies in children's books and reading interests. Historical backgrounds and development of: types of children's literature, folklore and oral tradition, levels of interest, criticism and evaluation, illustration, bibliography.

**260. Historical Bibliography.**

(Formerly numbered 211.) Early records and the manuscript period; history of the printed book and of periodical publications and newspapers, including materials and methods and production. Parallel history of scholarship, the book trade, and book collecting in ancient, medieval and modern Western civilization.

**261. Analytical Bibliography.**

History and methods of analytical bibliography with emphasis on recent scholarship. The book as a physical object and its relationship to the transmission of the text. Emphasis on hand-press books. Theories of Bradshaw, Proctor, Greg, McKerrow, Pollard, Esdaile, Bowers, Stevenson, Himan, McKenzie, and others. Lectures, discussion, press demonstrations, and a written report on a bibliographical problem.

**271. Seminar on Intellectual Freedom.**

Prerequisite: consent of the instructor. Investigation of the idea of intellectual freedom: historical and constitutional bases; civil liberties and civil rights; censorship and other restraints on freedom of speech, the press, the arts, and access to ideas and information.

**272. Seminar on Libraries in a Changing Society.**

Prerequisite: consent of the instructor. Changing requirements for education, reeducation, information, cultural enrichment, and communication in response to changes in social, economic, intellectual and political environments. Effects of technological advances, population shifts, and population trends.

**290. Research Methodology.**

Prerequisite: consent of the Dean. Role of research in bibliography, librarianship, and information science. Identification and design of research problems. Historical, statistical, analytical and descriptive techniques.

## Professional Courses

**400. Introduction to Librarianship.**

(Formerly numbered 203.) Introduction to the history of libraries and information centers, including their current status, organization, and problems. Professional education and research. Library literature and its bibliographical control. Trends in administration and management, national networks, standards, legislation, technology.

**402. Introduction to Bibliography.**

(Formerly numbered 200.) History of bibliography. Classification: historical, physical or critical (descriptive, analytical), enumerative or systematic, bibliographical apparatus, organization and control. Relationship to cataloging. New techniques and tools. Theory, methods, trends in bibliographical research.

**404. Introduction to Information Science.**

Scope of the information sciences and their relationship to libraries, information centers, information handling. Methods of systems analysis as applied to library operations; case studies of library systems, clerical operations, and information retrieval. Survey of data processing equipment.

**410. Descriptive Cataloging.**

(Formerly numbered 201A.) Entry and description of library materials. Constitution, structure, and form of the library catalog. Cataloging services, tools, and procedures. Cataloging rules and their application.

**411. Subject Cataloging and Classification.**

(Formerly numbered 201B.) Subject treatment of library materials. Structure of subject heading lists and their application. Organization of the subject catalog. Structure and application of the Dewey Decimal and Library of Congress classification systems. Organization of the classed catalog and the shelflist.

**412. Cataloging and Classification of Special Materials.**

(Formerly numbered 201C.) Problems in cataloging and classification of audio-visual and other non-book materials (e.g., manuscripts, maps, microforms, motion pictures, pictorial works, sound recordings, magnetic tapes) as separate collections and/or as parts of general collections.

**420. Basic Sources of Information.**

(Formerly numbered 202A.) History, methods and materials of reference service and information retrieval. Survey of devices for bibliographical control of information. Encyclopedias, dictionaries, bibliographical compilations, directories, etc.

**421. Comprehensive Bibliography.**

(Formerly numbered 202B.) Analysis and evaluation of bibliographical control of published and unpublished documents (books, periodicals, government publications, dissertations, reports, manuscripts). Systems of national bibliography, trade bibliography, indexing, abstracting, etc. American, British, French, German, Russian and other systems. Information retrieval using this apparatus.

**422. Secondary Bibliography.**

(Formerly numbered 202C.) Comparative analysis of the organization of information sources in the

humanities, fine arts, social sciences, life sciences, physical sciences and technologies. Problems of special libraries and information centers; reference and research service in general research libraries.

**430. Selection and Acquisition of Library Materials.**

(Formerly numbered 204.) Background of publishing and the book trade (new and antiquarian) pertinent to order departments of public, school, academic and special libraries. Theory and practice of selecting and ordering books and other materials. Organization and administration of order departments.

**431. Special Problems in the Selection of Materials and Evaluation of Collections.**

(Formerly numbered 205.) Subject and area collecting; special collections and rare books; building new collections. Evaluating and weeding collections. Cooperative collecting—regional, national and international. Storage centers; subject specialization. Special format materials: films, maps, sound recordings, etc. Copying methods; facsimile reprinting; changing character of research collections.

**432. Evaluation of Non-Book Materials.**

Prerequisite: consent of the instructor. Films, filmstrips, recordings, tapes, and other non-book materials in audiovisual collections or instructional materials centers. Bibliographical apparatus. Evaluation and collection development. Organization and administration.

**440. Data Processing in the Library.**

(Formerly numbered 406.) Principles of application of data processing technique to library procedures. Survey of available equipment and computation components; methods of using them with emphasis on programming in PL/I. Evaluation of specific programs and systems for various library clerical and administrative processes.

**441. Management of Libraries.**

Prerequisite: consent of the instructor. Principles of management, emphasizing management techniques applicable to libraries of various types and to library systems. Special attention to aspects of technical services.

**461. College, University and Research Libraries.**

(Formerly numbered 401.) Organization, administration, collections, facilities, finances, and problems of college and university libraries and their relationships within the institutions of which they are a part. Functions of research libraries and work of their staffs in serving scholars.

**463. Public Libraries.**

(Formerly numbered 402.) The government, organization, and administration of municipal, country, and regional public libraries; developments in the changing patterns of public library service.

**464. School Libraries.**

(Formerly numbered 403.) Elementary and secondary school libraries as multimedia instructional materials centers. Relationships of school libraries to school programs and curricula. Emphasis on administration, planning materials, services, and equipment.

**465. Children's Libraries.**

(Formerly numbered 404.) Public library service to children and young people. Function, administration, organization, services, materials, planning and equipment of children's libraries in relation to the public and school library.

**470. Special Libraries and Special Collections.**

(Formerly numbered 405.) Organization, administration, collections, facilities, finances and problems of special libraries and of special collections within general libraries. Methods of handling non-book materials. Current trends in documentation and mechanization.

**471. Medical and Biological Libraries.**

(½ course)

(Formerly numbered 418.) Required for Grade 1 certification by Medical Library Association, and enrollment limited to candidates for this certificate. Organization, administration, services and problems of biomedical libraries; relationships with institutions of which they are a part, and with the community.

**479. Libraries and Literature of the Southwest.**

(Formerly numbered 241.) Special readings, reports and discussions on the history, resources, and problems of libraries in the southwestern United States and northwestern Mexico. Literature of the Southwest.

**481. Information Centers.**

Prerequisite: consent of the instructor. Organization, administration, services, and problems in the operation of information centers and agencies concerned with research information science. Brief internship training in Institute of Library Research. Observation of on-campus and off-campus information centers.

**485. Archives and Manuscript Collections.**

Prerequisite: consent of instructor. Identification, description, subject analysis, and organization of records contained in archives and manuscript collections. Administration. User requirements. Problems of acquisition, legal title, literary property, preservation, accessibility, and use.

**489. Library Service to the Disadvantaged.**

Prerequisite: consent of the instructor. Special problems encountered by school, public, academic, special and research libraries in meeting the needs of minority groups in urban and rural settings. Library service to the old, the physically handicapped, and the institutionalized population.

**Professional Internship Courses****490. University Library Internship.**

Supervised professional training in one or more departments of the UCLA College Library or University Research Library. Field trips, when appropriate, to other libraries (e.g., Clark, Huntington, etc.). Minimum of 120 hours per quarter, including weekly critiques of bibliographical, administrative and service problems. Written reports; final oral examination. May be repeated twice.

**491. Medical Library Internship.**

(Formerly numbered 449M.) Supervised library service, at a professional level, in the UCLA Biomedical Library for a minimum of 120 hours per quarter, including weekly critiques of bibliographical administrative and service problems. Written reports, final oral examination. May be repeated twice.

**492. Science and Engineering Library Internship.**

(Formerly numbered 449S.) Supervised library service, at a professional level, in the UCLA Engineering and Mathematical Sciences Library for a minimum of 120 hours per quarter, including weekly critiques of bibliographical, administrative and service problems. Written reports, final oral examination. May be repeated twice.

**Individual Study Courses****586. Directed Individual Study or Research.**

(½ or 1 course)

Directed special studies in the fields of bibliography, librarianship, and information science. Report of studies to be planned for publication. Variable conference time and unit credit, depending upon complexity of research project. May be repeated to a total of two courses.

**597. Preparation for the Master's Comprehensive Examination.**

Directed study in preparation for the Comprehensive Examination, M.L.S. degree. Readings, conferences, reports. To be graded S/U.

**598. Research for and Preparation of the Master's Thesis. (½ or 1 course)**

Research and writing leading to the Master's Thesis in Information Science (Documentation). May be repeated to a total of two courses. To be graded S/U.

**Related Courses in Other Departments**

Education 329. Supervised Library Service.

441D. Junior College Administration.

English 112. Children's Literature.

**■ LINGUISTICS**

(Office, 1387 Graduate School of Business Administration Building)

William Bright, Ph.D., *Professor of Linguistics and Anthropology.*

Peter Ladefoged, Ph.D., *Professor of Phonetics.*

Paul M. Schachter, Ph.D., *Professor of Linguistics.*

Robert P. Stockwell, Ph.D., *Professor of Linguistics (Chairman of the Department)*

William E. Welmers, Ph.D., *Professor of Linguistics and African Languages.*

Victoria Fromkin, Ph.D., *Associate Professor of Linguistics (Acting Chairman).*

Barbara H. Partee, Ph.D., *Associate Professor of Linguistics.*  
 George D. Allen, Ph.D., *Assistant Professor of Phonetics.*  
 George D. Bedell, Ph.D., *Assistant Professor of Linguistics.*  
 Karen Courtenay, Ph.D., *Assistant Professor of Linguistics.*  
 Joseph Emonds, Ph.D., *Assistant Professor of Linguistics.*  
 Sandra A. Thompson, Ph.D., *Assistant Professor of Linguistics.*  
 Theo Vennemann, Ph.D., *Assistant Professor of Linguistics.*



Talmy Givón, Ph.D., *Acting Assistant Professor of Linguistics and African Languages.*  
 Martin Kay, Ph.D., *Lecturer in Linguistics.*  
 Charles H. Kraft, Ph.D., *Lecturer in Linguistics and African Languages.*  
 Frederick Longan, M.A., *Lecturer in African Languages.*



Raimo A. Anttila, Ph.D., *Assistant Professor of Classics.*  
 Bradford Arthur, Ph.D., *Assistant Professor of English.*  
 Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*  
 J. Donald Bowen, Ph.D., *Professor of English.*  
 Giorgio Buccellati, Ph.D., *Associate Professor of Ancient Near East.*  
 William E. Bull, Ph.D., *Professor of Spanish.*  
 Russell N. Campbell, Ph.D., *Associate Professor of English.*  
 Edward C. Carterette, Ph.D., *Professor of Psychology.*  
 Kenneth C. Chapman, Ph.D., *Associate Professor of Scandinavian Languages.*  
 Walter J. Dowling, Ph.D., *Assistant Professor of Psychology.*  
 Janos Eckmann, Ph.D., *Professor of Turkic Languages.*  
 Harry Hoijer, Ph.D., *Professor of Anthropology.*  
 Wolf Leslau, Docteur-ès-Lettres, *Professor of Hebrew and Semitic Linguistics.*  
 Donald G. MacKay, Ph.D., *Assistant Professor of Psychology.*  
 Marlys McClaran, Ph.D., *Acting Assistant Professor of Anthropology.*  
 Lois McIntosh, Ph.D., *Associate Professor of English.*  
 John W. Oller, Jr., Ph.D., *Assistant Professor of English.*  
 C. P. Otero, Ph.D., *Professor of Spanish.*  
 Thomas G. Penchoen, Ph.D., *Assistant Professor of Near Eastern Languages.*  
 Clifford H. Prator, Ph.D., *Professor of English.*  
 Jaan Puhvel, Ph.D., *Professor of Indo-European Studies.*  
 Earl Rand, Ph.D., *Assistant Professor of English.*  
 Stephen P. Schwartz, Ph.D., *Assistant Professor of German.*  
 Andreas Tietze, Ph.D., *Professor of Near Eastern Languages.*  
 Terence H. Wilbur, Ph.D., *Assistant Professor of German.*  
 Robert Wilson, Ph.D., *Assistant Professor of English.*  
 Dean S. Worth, Ph.D., *Professor of Slavic Languages.*

### The Undergraduate Major

This major should be elected only by students with an exceptional interest in and aptitude for the study of languages and linguistics. It enables the undergraduate to gain substantial familiarity with several languages and types of linguistic structure, and to become conversant with the historical study of language and formal theories of linguistic analysis.

*Preparation for the Major.* In the lower division, in addition to the general University

requirements, the student must complete the equivalent of the sixth quarter of work in two foreign languages, or the sixth quarter in one language and the third quarter in each of two others; Philosophy 31; and one course in Cultural Anthropology.

*Requirements for the Major.* A minimum of eleven upper division courses which must include Linguistics 100, 103, 110, 120A, 120B, 160, and either 170 or Anthropology 146; the other four may be selected from Linguistics 105, 125, 150, 161A, 161B, 170,

180, Anthropology 146, Indo-European Studies 160, 161, 162, Philosophy 127A, 127B, 192, Psychology 122, 123, Speech 103, English 121, 122, or upper division courses in any foreign language for which the student's lower division preparation qualifies him. In addition to the eleven upper division courses, three courses (which may be either upper or lower division) are required in a non-Indo-European language.

### The Graduate Linguistics Program

The Programs leading to the M.A. and Ph.D. degrees in linguistics are open to qualified graduate students who are interested in the theory and methods of structural and historical linguistics. Preparation for graduate study in linguistics should be equivalent in as many respects as possible to the undergraduate curriculum in linguistics.

### Admission to the Program

In addition to meeting the requirements of the Graduate Division, the applicant should have (1) an A.B. degree in linguistics or in a language or social science field, and (2) must have completed Linguistics 100, 110, and 103, 120A-120B or their equivalent. Letters from the applicant's former instructors should be provided, and the applicant should submit to the Chairman a detailed account of his aims in graduate study of linguistics and his background for it. A sample of the applicant's research should be submitted to the chairman (e.g., a term paper from some relevant course). Admission for the fall quarter will be granted only for students without undergraduate deficiencies, or for students with a full year of such deficiencies to make up. Students with less than one year of deficiency work can be admitted in the winter or spring quarters as needed to repair the deficiencies. Upon admission to graduate status, the student should consult a graduate adviser about the planning of his studies.

### Requirements for the Master's Degree

*General Requirements.* See those of the Graduate Division.

The M.A. degree is awarded on the basis of the completion, with a B average or better, of nine courses in linguistics of which at least five must be graduate courses (numbered 200-299 and the 590 series), and the passing of a general comprehensive examination, described below. Courses taken in preparation for the examinations will vary considerably, depending on the prior prepara-

tion of the student; they are selected in close consultation with a graduate adviser of the department.

The areas of the comprehensive examination are (1) Phonological Theory, (2) Syntactic Theory, (3) Historical Linguistics, and (4) either a language-specific historical/comparative specialization (described below), or linguistic analysis/problem solving. Under the fourth area, the historical option can be selected only by students who are going on to specialize in that area for the doctorate; the *general* degree requires passing the examination in linguistic analysis.

Available courses in preparation for each area are the following:

Phonology: 103, 120A, 161A, 200A, 200B.

Syntax: 120B, 161B, 205A, 205B, 205C.

Historical: 110, 202.

Linguistic Analysis: 120A, 120B, 210A, 210B.

Courses 103, 110, 120A, 120B are considered as undergraduate deficiency courses and are prerequisite to graduate courses in the corresponding areas. Course 103 must be passed with a grade of B or better as prerequisite to 210A-B, and if waived on the basis of training elsewhere the student must pass an examination in practical phonetics at the B level or better in order to take 210A-B.

The program of the student may be varied in several directions, even at the M.A. level. If he expects to specialize at the doctoral level in general and experimental phonetics, he will normally wish to include 230A-B early in his program. If he expects to specialize in one of the interdisciplinary fields such as sociolinguistics, he will wish to include 170 and 215 fairly early; similarly, for psycholinguistics, Psychology 123; for computational linguistics, 240A-B; for mathematical linguistics, 180 and 235; for particular language fields, the appropriate area and structure courses from the 220 and 225 series; for ethnolinguistics, Anthropology 146; for linguistics in relation to language teaching, 140 and several courses from the TESL program of the English Department. But the hard core of the M.A. remains the work in three areas of theory—phonology, syntax, historical—plus implementation of theory either in field work with a new language, or historical/comparative work in a well-documented area. How much preparation will be needed by a particular student in a particular area can only be determined by consultation between student and adviser. Normally a

student who enters the program more or less innocent of prior training in linguistics must expect to spend two years in preparation for the comprehensive examinations during which period he will have some time also to begin specializing in a sub-area of the type listed above.

Those candidates who wish to combine work in general linguistic theory with in-depth studies in historical methodology and the comparative investigation of specific language families or sub-families must possess adequate advanced training in the language area of their choice and must select one of the fields currently designated for specialization. These fields are Ancient Indo-European, Germanic including English, Semitic, and Turkic. Others such as Romance and Finno-Ugric will be added as available staff permits. The courses appropriate to such specialization, beyond what the student needs in preparation for the phonology, syntax, and historical areas of the comprehensive examinations, are chosen in consultation with appropriate advisers (Ancient Indo-European: Professors Anttila, Birnbaum, Puhvel, Schwartz, Wilbur, Worth; Germanic including English: Professors Chapman, Schwartz, Stockwell, Venneman, Wilbur; Semitic: Professors Leslau, Buccellati; Turkic: Professors Tietze, Eckmann). The courses in the language specialization are normally selected from the following lists: for Ancient Indo-European: IES 210 and three courses from IES 170 (or more advanced), 215A, 215B, 218A, 218B, 220A, 220B, 222A, 224, 225, 230A, Armenian 130A (or more advanced), German 231, Slavic 201; for Germanic including English: German 230, English 210, one course chosen from German 231, 232, 233, Scandinavian 151 (or more advanced); one course chosen from German 217, English 212; for Semitic: two full course equivalents chosen from Semitics 280A, 280B, 280C and 290A, 290B, 290C, and one advanced language course in each of two Semitic languages, chosen in consultation with the adviser; for Turkic: two full course equivalents chosen from Turkish 110A, 110B, 110C and 190A, 190B, 190C, and one advanced course in each of two Turkic languages. As indicated above, the fourth area of the comprehensive examination for these students is their specific language field, rather than linguistic analysis of field-like data.

Students who do not expect to pursue a doctoral program but whose professional goals (language teaching, research in in-

dustry, etc.) require basic training in linguistic theory with special emphasis given to applications may apply courses taken toward the TESL Certificate also toward the M.A. in linguistics: in particular, English 250K, 251K, 213, 241, and Linguistics 103 and 120A, 120B. The areas of the comprehensive examination remain the same for all candidates, however: alternative questions in each area are provided to allow for diversity of preparation.

*The Language Requirement.* All candidates for the M.A. must pass a reading examination, administered through the Graduate Division, in one foreign language, approved by the student's graduate adviser. If not one of the standard research languages, the language must be one which the student demonstrates is indispensable to his research area. Speakers of languages other than English are permitted to use English to meet the foreign language requirement, although if English was the language of instruction in their elementary and secondary education, this is not permitted.

*Transfer Credit.* No more than two courses (with grades of B or above) may be transferred toward the M.A. from institutions outside the University of California, though equivalent training elsewhere provides the basis for determining what courses the student would be well-advised to take before attempting the comprehensive examinations.

*Grades and Probationary Status.* An average of 3.00 must be maintained in all course work. Students with grade records fractionally below 3.00 in a given term are considered to be on probation for the following term, during which term their grade record must be brought up to 3.00. Students whose grade records do not meet these minimal standards are subject to dismissal.

*The Comprehensive Examinations.* As soon after completion of nine courses as the student and his adviser agree that he is ready, but not later than the equivalent of six quarters of full-time residence, the candidate for the M.A. must undertake the comprehensive examinations. He must also have passed his reading examination in a foreign language approved by his adviser. The comprehensive examinations are given in three, or under special conditions four, parts, occupying several days near the end of the fall and spring quarters, i.e., late in November and late in May. Students may register for Linguistics 597 (Preparation for Comprehensive and Qualifying Examinations) during the

term when they intend to stand for the examinations, and the graduate student organization (the Graduate Linguistic Circle, GLC) commonly arranges informal study programs to assist in this preparation. The parts of the examination are these:

1. A four-to-six-hour blue-book examination, requiring essays on specified topics in phonology, syntax, and historical linguistics.

2. Two outside essays on specified topics in phonology and grammar, totaling about 4500 words.

3. A linguistics problem for analysis, given a corpus and specific questions about the structure of the language represented in it: arrive at a solution; or, a historical/comparative examination in the student's language area.

4. Oral examination at the discretion of the examiners in particular cases.

Three levels of performance on the comprehensive examinations are assigned: (1) Pass with distinction (the necessary level for students to be admitted into the doctoral program); (2) Pass for M.A. but not qualified for admission to the doctoral program; and (3) Fail. There is no guarantee that students who do not pass with distinction may try the examination a second time: A second trial is permitted by the faculty only when they believe there is clear promise of success—a second trial may be granted as a privilege, but it is not automatic. Pass with distinction carries with it the privilege, and for those who continue in the doctoral program the obligation, of participating in the bi-weekly Linguistics Colloquium.

#### Requirements for the Doctor's Degree

Candidates for the Ph.D. degree in linguistics must have earned with distinction the M.A. degree in linguistics (or its equivalent, as demonstrated by passing the M.A. comprehensive examination), and must conform to the general requirements set by the Graduate Division for the Ph.D. degree.

Candidates for the Ph.D. are required to take for credit at least three seminars prior to their oral qualifying examinations. Candidates must take written qualifying examinations (which may be in the form of seminar research papers) and an oral qualifying examination, in specified doctoral fields, as follows: If a candidate wishes to pursue the doctorate in the general linguistics channel, one field must be general linguistic theory. He must have two other fields, of which one is normally a specific language area, by which

is meant one or two languages studied in depth, plus all that is known of their genetic, areal, and typological relationships to other languages; and the other is selected from mathematical and/or computational linguistics, sociolinguistics and/or ethno-linguistics, experimental and/or general phonetics, historical and comparative linguistics, psycholinguistics, or linguistics in relation to language teaching (the last two often combined), or the third field may be proposed by the candidate in some narrower area.

If a candidate wishes to pursue the doctorate in the historico-comparative channel, he selects two fields, one of which is general linguistic theory and the other is the historico-comparative aspects of the language specialization that he initiated in the historico-comparative channel for the M.A.

If a candidate wishes to pursue the doctorate in the phonetics channel, he selects two fields, one of which is general linguistic theory and the other is general and experimental phonetics, including detailed phonetic investigation within some particular language area.

(The dissertation and the final oral examination are required in accordance with the requirements of the Graduate Division.) Before the dissertation is begun, the subject must be approved by the faculty of the Department, on the basis of a prospectus submitted to the candidate's doctoral committee, with a copy to the Department. Prerequisite to such approval is a presentation by the candidate of the proposal and the preliminary research at a meeting of the Linguistics Colloquium. The Linguistics Colloquium has biweekly meetings throughout the year. Advanced graduate students (beyond the comprehensive examinations) are required to participate.

All students are required to pass reading proficiency examinations in two languages approved by the faculty of the Department.

For information on student support in the form of fellowships, research assistantships, and teaching assistantships, consult the Chairman of the Department.

#### Language Sections of the Department

The African Languages section of the Linguistics Department offers instruction in many of the major languages of Africa, relevant comparative-linguistics courses, and courses in African literature. The section on South Asian Languages offers instruction in Thai, Tagalog, and Hindi.



## General Linguistics

### Lower Division Courses

#### 1. Introduction to the Study of Language.

A summary of what is known about human language: the unique nature of human language, its structure, its universality, and its diversity; language in its social and cultural setting; language in relation to other aspects of human inquiry and knowledge.

Mr. Bedell, Mr. Schachter, Mrs. Thompson

#### 2. Linguistics and Minority Dialects.

Prerequisite: course 1. A survey of the main features of vocabulary, grammar, and pronunciation which distinguish the usage of Afro-American and Spanish-American speakers of English, and their historical origins.

Mr. Bright

### Upper Division Courses

#### 100. Introduction to Linguistics.

A beginning course in the descriptive and historical study of language: linguistic analysis; linguistic structures; language classification; language families of the world; language in its social and cultural setting.

The Staff

#### 103. Introduction to General Phonetics.

Prerequisite: course 100 or equivalent (100 may be taken concurrently with 103). The phonetics of a variety of languages and the phonetic phenomena that occur in languages of the world. Extensive practice in the perception and production of such phenomena. A special section emphasizes those languages likely to be of interest to teachers of English as a Second Language.

Mr. Allen, Mrs. Fromkin, Mr. Ladefoged

#### 110. Introduction to Historical Linguistics.

(Same as Indo-European Studies 149.) Prerequisite: course 100. The methods and theories appropriate to the historical study of language, such as the comparative method and method of internal reconstruction. Sound change, grammatical change, semantic change.

Mr. Anttila, Mr. Bright, Mr. Vennemann

#### 120A. Linguistic Analysis: Phonology.

Prerequisite: course 100 and 103. Course 120A is not prerequisite to 120B. Descriptive analysis of phonological structures in natural languages: emphasis on insight into the nature of such structures rather than linguistic formalization.

Mr. Bedell

#### 120B. Linguistic Analysis: Grammar.

Prerequisite: course 100; course 120A is not prerequisite to 120B. Descriptive analysis of morphological and syntactic structures in natural languages: emphasis on insight into the nature of such structures rather than linguistic formalization.

Mr. Emonds

#### 125. Cybernetics and Human Communication.

An introductory survey of the communication process from the point of view of linguistics, mathematics, engineering, physiology, and psychology.

Mr. Allen, Mrs. Fromkin, Mr. Ladefoged

#### 140. Linguistics in Relation to Other Disciplines.

Prerequisite: course 100. The role of linguistics in language learning, communications engineering, translation, literary criticism, psychology, and psychotherapy; recent developments in applied linguistics.

Mr. Kraft

#### 150. Introduction to Indo-European Linguistics.

(Same as Indo-European Studies 150.) Prerequisite: one year of college level study (course 3 or better, 8 units minimum) of either Greek or Latin and either German or Russian. A survey of the Indo-European languages from ancient to modern times; their relationships and their chief characteristics.

Mr. Anttila, Mr. Puhvel

#### 160. History of Linguistics Through the 19th Century.

Prerequisite: courses 120A-B. Historical survey of the development of linguistics from Pāṇini through the 19th century, including approaches to grammar, phonology, and language universals.

Mr. Bedell, Mrs. Fromkin

#### 161A. Contemporary Theories: Phonology.

Prerequisite: course 120A. Survey of theories of phonological analysis, mainly of this century, from historical and critical points of view.

Mr. Schachter

#### 161B. Contemporary Theories: Grammar.

Prerequisite: course 120B. Survey of theories of grammatical analysis, mainly of this century, from historical and critical points of view.

Mr. Emonds

#### 170. Language and Society: Introduction to Sociolinguistics.

Prerequisite: course 100. Study of the patterned covariation of language and society; social dialects and social styles in language; problems of multi-lingual societies.

Mr. Arthur, Mr. Bright

#### 180. Mathematical Backgrounds for Linguistics.

Prerequisite: courses 120A, 120B. Introduction to selected topics in set theory, logic and formal systems, modern algebra, and automata theory, with elementary applications to linguistics. No previous mathematics assumed.

Mr. Kay, Mrs. Partee

#### 199. Special Studies in Linguistics. (½ or 1 course)

Prerequisite course 120A, 120B, and consent of instructor. May be repeated for credit.

The Staff

### Graduate Courses

Seminars (numbered 250 and above) may be repeated for credit, having been approved by the Graduate Council as nonrepetitive in content.

#### 200A. Phonological Theory I.

Prerequisite: course 120A. The form of phonological rules; formal and substantive universals of phonology; phonological problems from a variety of languages.

Mrs. Fromkin, Mr. Schachter, Mr. Vennemann

#### 200B. Phonological Theory II.

Prerequisite: course 200A. Continuation of course 200A.

Mrs. Fromkin, Mr. Schachter, Mr. Vennemann

#### 202. Historical Linguistics.

(Same as Indo-European Studies 209.) Prerequisite: course 110 or equivalent. Advanced study of the comparative method, historical and internal reconstruction, internal and external borrowing.

Mr. Anttila, Mr. Vennemann

**205A. Grammatical Theory I.**

Prerequisite: course 120B. The form of grammars; word formation and sentence formation; formal and substantive universals of grammar

Mr. Bedell, Mr. Schachter, Mrs. Thompson

**205B. Grammatical Theory II.**

Prerequisite: course 205A. Problems in grammatical analysis and their theoretical implications.

Mr. Partee, Mr. Schachter

**205C. Grammatical Theory III.**

Prerequisite: Course 205B. Current issues in grammatical theory.

Mr. Schachter, Mrs. Partee, Mr. Emonds

**210A. Field Methods I.**

Prerequisite: courses 103 or 200A, and 205A; corequisite or prerequisite: course 200B. A language unknown to members of the class to be analyzed from data elicited from an informant. The term papers will be relatively full descriptive sketches of the language of the informant. May be repeated for credit when a different language is under investigation.

Mr. Bright, Mr. Welmers, Mr. Givón

**210B. Field Methods II.**

Prerequisite: course 210A in the preceding quarter. Because different languages will be investigated in different years, 210B can only be taken as a direct continuation of 210A in the same year. When there are multiple sections, continuation must be in the same section. May be repeated for credit when a different language is under investigation.

Mr. Bright, Mr. Welmers, Mr. Givón

**215A. Areal Dialectology.**

Prerequisite: course 120A and 120B, or equivalent. Theoretical and technical study of dialect variation in relation to geographical distribution.

The Staff

**215B. Social Dialectology.**

Prerequisite: courses 120A and 120B, or equivalent. Theoretical and technical study of dialect variation in relation to social differences, primarily in America.

The Staff

**220. Linguistic Areas.**

Prerequisite: courses 120A, 120B; recommended preparation: courses 200B and 205A; may be repeated, in different sections, for credit. Analysis and classification of languages spoken in a particular area. Offered in one or more of the following sections each year.

The Staff

220A. Africa.

\*220B. The Balkans.

220C. South Asia.

\*220D. Southeast Asia.

220E. Australia.

220F. Aboriginal North America.

220G. Aboriginal Latin America.

\*220H. The Far East.

**225. Linguistic Structures.**

Prerequisite: courses 120A, 120B; recommended preparation: courses 200B and 205A; may be repeated, in different sections, for credit. Phonological and grammatical structure of a selected language, and its genetic relationships to others of its family.

\* Not to be given, 1970-1971.

Though sectioned by families, the same language will not necessarily be the subject of study each time that family is offered. Offered in one or more of the following sections each year.

The Staff

\*225A. Indo-European

225B. Germanic.

\*225C. Slavic.

\*225D. Dravidian.

\*225E. Indo-Aryan.

\*225F. Uto-Aztecan.

225G. Romance.

225H. Japanese.

\*225J. Tai.

225K. Malayo-Polynesian.

\*225L. Finno-Ugric.

225M. Berber.

\*225N. Athabaskan.

225P. Chinese.

225R. English Phonology.

\*225S. Swahili.

225T. Mayan.

**230A. Experimental Methods in Linguistics.**

Prerequisite: course 200A. Techniques of experimental research in linguistics, including instrumentation in experimental phonetics and psycholinguistics, experimental design, and statistical evaluation.

Mr. Allen

**230B. Experimental Design and Analysis.**

Prerequisite: course 200A. Theory and practice, control and measurement encountered in experimental research in speech.

Mr. Allen

**235. Mathematical Linguistics.**

Prerequisite: course 180 or equivalent. Formal properties of various types of grammars, including linear, context-free, and context-sensitive phrase structure grammars and unrestricted rewriting systems. Related formal properties of natural language.

Mrs. Partee

**240A-240B. Computational Linguistics.**

Prerequisite: course 180 or equivalent; course 240A is prerequisite to 240B. Introduction to digital computers, algorithms and programming of linguistic tasks. Topics selected from dictionary maintenance and lookup, sentence generation and analysis, concordance construction, question answering, mechanical translation, etc.

Mr. Kay

**250A. Phonological Theory. Seminar.**

Prerequisite: course 200B. Problems in phonological theory and in the phonological analysis of a variety of languages.

The Staff

**250B. Grammatical Theory. Seminar.**

Prerequisite: course 205B. Problems in grammatical and lexical theory and in the analysis of a variety of languages.

The Staff

**250C. Topics in Linguistic Theory. Seminar.**

Prerequisite: course 250B. The metatheory of language description and the history of linguistic theory.

The Staff

**255A. Acoustic Phonetics. Seminar.**

Prerequisite: course 230A.

Mr. Allen, Mrs. Fromkin, Mr. Ladefoged

**255B. General Phonetics. Seminar.**

Prerequisite: course 200A.

Mr. Allen, Mrs. Fromkin, Mr. Ladefoged

**255C. Physiological Phonetics. Seminar.**

Prerequisite: course 200A.

Mr. Allen, Mrs. Fromkin, Mr. Ladefoged

**265A. Ethnolinguistics. Seminar.**

Problems in the relation of language to culture; structural semantics; language and prehistory

Mr. Bright

**265B. Sociolinguistics. Seminar.**

(Same as Sociology 278.) Prerequisite: course 170.

Mr. Bright

**270A. Historical Linguistics I. Seminar.**

(Same as Indo-European Studies 270A.) Prerequisite: course 202. Course 270B is normally post-prerequisite of 270A. Problems in the use of the comparative method in historical linguistics.

Mr. Antilla, Mr. Vennemann

**270B. Historical Linguistics II. Seminar.**

(Same as Indo-European Studies 270B.) Prerequisite: course 270A in the preceding quarter. Problems in the internal reconstruction of the history of languages.

Mr. Antilla, Mr. Vennemann

## Individual Study and Research

**506A. Directed Studies. (¼ to 2 courses)**

Prerequisite: courses 200B and 205B. Up to one full course may be applied toward fulfillment of M.A. course requirements. Directed individual study or research. May be repeated for credit. Graded satisfactory/unsatisfactory.

The Staff

**506B. Directed Informant Work. (¼ to 2 courses)**

Prerequisite: pass with distinction on the M.A. comprehensive examination. Intensive informant work by students individually. May be repeated for credit. Graded satisfactory/unsatisfactory. The Staff

**507. Preparation for Master's Comprehensive and Doctoral Qualifying Examinations.**

(¼ to 2 courses)

Prerequisite: courses 200B and 205A. Can be taken *only* in the quarters in which the student expects to stand for his comprehensive or qualifying examinations. May not be applied toward fulfillment of M.A. course requirements. May be repeated for credit. Graded satisfactory/unsatisfactory. The Staff**509. Research for Dissertation. (¼ to 4 courses)**

Prerequisite: advancement to candidacy for the Ph.D. degree. May be repeated for credit. Graded satisfactory/unsatisfactory.

The Staff

**African Languages**

## Upper Division Courses

**101A-101B-101C. Elementary Swahili.**

Five hours. The major language of East Africa, particularly Tanzania.

Mr. Longan

**102A-102B-102C. Intermediate Swahili.**

Five hours. Prerequisite: courses 101A-101B-101C or consent of the instructor.

Mr. Longan

**103A-103B-103C. Advanced Swahili.**

Prerequisite: courses 102A-102B-102C or consent of the instructor. Readings in Swahili literature and the contemporary press. Discussions mainly in Swahili.

Mr. Longan

**104A-104B-104C. Elementary Luganda.**

Five hours. A major language of Uganda.

Mr. Givón

**107A-107B-107C. Elementary Sotho.**

Five hours. Southern Sotho, spoken primarily in Basutoland and Orange Free State, mutually intelligible with adjacent Northern Sotho and Tswana.

The Staff

**\*108A-108B-108C. Elementary Zulu.**

Five hours. The most widely spoken of the Nguni languages of South Africa, mutually intelligible with other members of this group.

The Staff

**\*109A-109B-109C. Elementary Xhosa.**

Five hours. A major Nguni language of South Africa, mutually intelligible with other members of this group.

The Staff

**110A-110B-110C. Intermediate Xhosa.**

Five hours. Prerequisite: courses 109A-109B-109C or consent of the instructor.

The Staff

**111A-111B-111C. Elementary Yoruba.**

Five hours. The major language of western Nigeria.

Miss Courtenay

**112A-112B-112C. Intermediate Yoruba.**

Five hours. Prerequisite: courses 111A-111B-111C or consent of the instructor.

Miss Courtenay

**113A-113B-113C. Elementary Igbo.**

Five hours. The major language of eastern Nigeria.

Mr. Weimans

**114A-114B-114C. Intermediate Igbo.**

Five hours. Prerequisite: courses 113A-113B-113C or consent of the instructor.

Mr. Weimans

**\*115A-115B-115C. Elementary Twi.**

Five hours. The major language of Ghana, including Ashanti, Fante, and other mutually intelligible dialects.

The Staff

**\*121A-121B-121C. Elementary Fula.**

Five hours. The language of the Fulani, spoken in widely scattered areas of West Africa, including major concentrations in Guinea and the Nigeria-Cameroon area.

The Staff

**131A-131B-131C. Elementary Bambara.**

Five hours. The major language of Mali, also widely spoken in adjacent parts of west Africa; includes Maninka (Malinke), Dyula, and other mutually intelligible dialects.

Miss Courtenay

**\*132A-132B-132C. Intermediate Bambara.**

Prerequisite: courses 131A-131B-131C or consent of instructor.

Miss Courtenay

**141A-141B-141C. Elementary Hausa.**

Five hours. The major language of northern Nigeria and adjacent areas.

Mr. Kraft

\* Not to be given 1970-1971.

**142A-142B-142C. Intermediate Hausa.**

Five hours. Prerequisite: courses 141A-141B-141C or consent of the instructor. Mr. Kraft

**143A-143B-143C. Advanced Hausa.**

Prerequisite: courses 142A-142B-142C or consent of the instructor. Readings in Hausa literature and the contemporary press. Discussions mainly in Hausa. Mr. Kraft

**150A-150B. African Literature in English Translation.**

Three hours. Courses 150A and 150B may be taken independently for credit. Narrative and didactic oral prose and poetry of sub-Saharan Africa, and written prose and poetry of South Africa. The Staff

**190. Survey of African Languages.**

An introduction to the languages of Africa, their distribution and classification, and their phonological and grammatical structures; illustrations from several representative languages, with appropriate language laboratory demonstrations and drills. Mr. Welmers

**\*192. Comparative Studies in African Languages.**

Prerequisite: two quarter courses in an African language, or course 190; Linguistics 110 is recommended as a prior or concurrent course. Comparison of structural and lexical features of a group of closely related languages, such as southern Bantu, southwestern Mande, Akan, or Senufo. The Staff

**199. Special Studies in African Languages.**

(¼ to 1½ courses)

Prerequisite: consent of the instructor. Instruction or supervised research based on the needs of the individual student, in any language or group of languages for which appropriate facilities are available. The Staff

**Graduate Courses****\*201A-201B. Comparative Niger-Congo.**

Prerequisites: Linguistics 202, 220A; three quarter courses in one language selected from courses 101-132, 199. Investigation of relationships within the Niger-Congo family as a whole, or within selected branches of the family. Mr. Welmers

**202A-202B. Comparative Bantu.**

Prerequisites: Linguistics 202, 220A; three quarter courses in one Bantu language selected from African Languages 101-110, 199. Investigation of relationships among the Bantu languages; the extent and external relationships of Bantu. Mr. Givón

**260. Seminar in African Languages.**

Mr. Kraft, Mr. Welmers

**270. Seminar in African Literature.**

The Staff

**Individual Study and Research****596. Directed Studies. (¼ to 2 courses)**

Directed individual study or research. Up to one full course may be applied toward fulfillment of M.A. course requirements. May be repeated for credit. Graded satisfactory/unsatisfactory. The Staff

\* Not to be given 1970-1971.

**South Asian Languages****Upper Division Courses****151A-151B-151C. Elementary Thai.**

Five hours. The major language of Thailand. Mr. Campbell

**152A-152B-152C. Intermediate Thai.**

Prerequisite: courses 151A-151B-151C or consent of instructor. Mr. Campbell

**161A-161B-161C. Elementary Tagalog.**

Five hours. The national language of the Philippines. Mr. Bowen

**171A-171B-171C. Hindi.**

Five hours. Mr. Bright

**Related Courses in Other Departments  
(Other than Language Courses)**

Anthropology 146. Language in Culture.

263. Ethnolinguistics. Seminar.

Indo-European Studies (Department of Classics) 210. Indo-European Linguistics: Advanced Course.

226. Celtic Linguistics.

280. Seminar in Indo-European Linguistics.

English 121. History of the English Language.

122. The Structure of Modern American English.

212. History of the English Language.

213. The Development of Modern English.

240. Phonological Structure and Dialectology.

241. Grammatical and Lexical Structure.

250K. Contrastive Analysis of English and Other Languages.

251K. Bilingual Comparative Studies. Seminar.

260K. Psycholinguistics and Language Teaching. Seminar.

Folklore 217. Folk Speech.

French 204A. Phonology and Morphology from Vulgar Latin to French Classicism.

204B. Syntax and Semantics from Vulgar Latin to French Classicism.

Germanic Languages 117. Language and Linguistics.

217. History of the German Language.

230. Survey of Germanic Philology.

290. Seminar in Germanic Linguistics.

**Scandinavian Languages (Department of Germanic Languages)** 211. Typology of the Scandinavian Languages.

212. History of the Scandinavian Languages.

**Latin (Department of Classics)** 240. History of the Latin Language.

**Hebrew (Department of Near Eastern Languages)** 190A-190B. Survey of Hebrew Grammar.

210A-210B. History of the Hebrew Language.

**Semitics (Department of Near Eastern Languages)** 209A-209B-209C. Comparative Study of the Ethiopian Languages.

280A-280B-280C. Seminar in Comparative Semitics.

290A-290B-290C. Comparative Morphology of the Semitic Languages.

**Turkic Languages (Department of Near Eastern Languages)** 190A-190F. Survey of the Turkic Languages.

**Oriental Languages** 175A-175B. The Structures of the Chinese and Japanese Languages.

223. History of the Japanese Language.

**Philosophy** 127A-127B. Philosophy of Language.

192. Philosophy of Language.

287. Seminar: Philosophy of Language.

**Psychology** 122. Language and Communication.

123. Psycholinguistics.

202. Verbal Behavior and Thinking.

231. Seminar in Language and Communication.

260A. Psycholinguistics I. Seminar.

260B. Psycholinguistics II. Seminar.

**Slavic Languages** 202. Introduction to Comparative Slavic Linguistics.

242A-242B. Comparative Slavic Linguistics.

281. Seminar in Slavic Linguistics.

282. Seminar in Structural Analysis.

**Russian (Department of Slavic Languages)**

241. Russian Phonology.

242. Russian Morphology.

264A-264B. The Evolution of Literary Russian.

265. Russian Syntax.

**Spanish (Department of Spanish and Portuguese)** 100. Phonetics and Phonemics.

103. Morphology and Syntax.

115. Applied Linguistics.

118. History of the Spanish and Portuguese Languages.

203. The Development of the Spanish Language.

206. Linguistics.

209. Dialectology.

256A-256B. Studies in Linguistics and Dialectology.

**Portuguese (Department of Spanish and Portuguese)** 203. The Development of the Portuguese Language.

**Speech**

102. Background and Theories of Oral Communication.

103. Phonetics of English.

104. Science of Speech.

## ■ MATHEMATICS

(Department Office, 6364 Mathematical Sciences Building)

Richard F. Arens, Ph.D., *Professor of Mathematics.*

A. V. Balakrishnan, Ph.D., *Professor of Mathematics and Engineering.*

Edwin F. Beckenbach, Ph.D., *Professor of Mathematics.*

David G. Cantor, Ph.D., *Professor of Mathematics.*

C. C. Chang, Ph.D., *Professor of Mathematics.*

Alonzo Church, Ph.D., *Professor of Mathematics and Philosophy in Residence.*

Earl A. Coddington, Ph.D., *Professor of Mathematics (Chairman of the Department).*

Philip C. Curtis, Jr., Ph.D., *Professor of Mathematics (Vice-Chairman).*

Henry A. Dye, Ph.D., *Professor of Mathematics.*

Thomas S. Ferguson, Ph.D., *Professor of Mathematics.*

- Basil Gordon, Ph.D., *Professor of Mathematics.*  
 John W. Green, Ph.D., *Professor of Mathematics.*  
 Magnus R. Hestenes, Ph.D., *Professor of Mathematics.*  
 Paul G. Hoel, Ph.D., *Professor of Mathematics.*  
 Alfred Horn, Ph.D., *Professor of Mathematics.*  
 S. T. Hu, Ph.D., *Professor of Mathematics.*  
 Paul B. Johnson, Ph.D., *Professor of Mathematics.*  
 Robion C. Kirby, Ph.D., *Professor of Mathematics.*  
 Theodore S. Motzkin, Ph.D., *Professor of Mathematics.*  
 Mitsuru Nakai, Ph.D., *Professor of Mathematics.*  
 Barrett O'Neill, Ph.D., *Professor of Mathematics.*  
 Lowell J. Paige, Ph.D., *Professor of Mathematics.*  
 Sidney Port, Ph.D., *Professor of Mathematics.*  
 Raymond M. Redheffer, Ph.D., *Professor of Mathematics.*  
 Leo Sario, Ph.D., *Professor of Mathematics.*  
 Robert H. Sorgenfrey, Ph.D., *Professor of Mathematics.*  
 Robert Steinberg, Ph.D., *Professor of Mathematics.*  
 Charles J. Stone, Ph.D., *Professor of Mathematics.*  
 Ernst G. Straus, Ph.D., *Professor of Mathematics.*  
 J. Dean Swift, Ph.D., *Professor of Mathematics.*  
 Angus E. Taylor, Ph.D., *Professor of Mathematics.*  
 Charles B. Tompkins, Ph.D., *Professor of Mathematics.*  
 Frederick A. Valentine, Ph.D., *Professor of Mathematics.*  
 V. S. Varadarajan, Ph.D., *Professor of Mathematics.*  
 Paul H. Daus, Ph.D., *Emeritus Professor of Mathematics.*  
 I. S. Sokolnikoff, Ph.D., *Emeritus Professor of Mathematics.*  
 Donald G. Babbitt, Ph.D., *Associate Professor of Mathematics.*  
 Victor Barcilon, Ph.D., *Associate Professor of Mathematics and Member of the Institute of Geophysics and Planetary Physics.*  
 Robert J. Blattner, Ph.D., *Associate Professor of Mathematics.*  
 Robert F. Brown, Ph.D., *Associate Professor of Mathematics.*  
 Theodore Gamelin, Ph.D., *Associate Professor of Mathematics.*  
 David Gillman, Ph.D., *Associate Professor of Mathematics.*  
 Alfred Hales, Ph.D., *Associate Professor of Mathematics.*  
 Robert I. Jennrich, Ph.D., *Associate Professor of Mathematics and Biomathematics.*  
 Paul J. Koosis, Ph.D., *Associate Professor of Mathematics.*  
 Ronald Miech, Ph.D., *Associate Professor of Mathematics.*  
 Yiannis N. Moschovakis, Ph.D., *Associate Professor of Mathematics.*  
 William T. Puckett, Ph.D., *Associate Professor of Mathematics.*  
 N. Donald Ylvisaker, Ph.D., *Associate Professor of Mathematics.*  
 Leonard Asimow, Ph.D., *Assistant Professor of Mathematics.*  
 Kirby A. Baker, Ph.D., *Assistant Professor of Mathematics.*  
 David G. Booth, Ph.D., *Assistant Professor of Mathematics.*  
 Douglas N. Clark, Ph.D., *Assistant Professor of Mathematics.*  
 Michael G. Crandall, Ph.D., *Assistant Professor of Mathematics.*  
 Rodolfo DeSapio, Ph.D., *Assistant Professor of Mathematics.*  
 Hector O. Fattorini, Ph.D., *Assistant Professor of Mathematics.*  
 Fred Galvin, Ph.D., *Assistant Professor of Mathematics.*  
 John Garnett, Ph.D., *Assistant Professor of Mathematics.*  
 Nathaniel Grossman, Ph.D., *Assistant Professor of Mathematics.*  
 Kenneth Hannsgen, Ph.D., *Assistant Professor of Mathematics.*  
 Richard Herman, Ph.D., *Assistant Professor of Mathematics.*  
 Albert E. Hurd, Ph.D., *Assistant Professor of Mathematics.*

- Charles G. Lange, Ph.D., *Assistant Professor of Mathematics.*  
 Thomas M. Liggett, Ph.D., *Assistant Professor of Mathematics.*  
 Johnnie W. McLaurin, Ph.D., *Assistant Professor of Mathematics.*  
 Kalyan Mukherjea, Ph.D., *Assistant Professor of Mathematics.*  
 Alan Newell, Ph.D., *Assistant Professor of Mathematics and Planetary and Space Physics.*  
 James V. Ralston, Jr., Ph.D., *Assistant Professor of Mathematics.*  
 Bruce L. Rothschild, Ph.D., *Assistant Professor of Mathematics.*  
 David A. Sánchez, Ph.D., *Assistant Professor of Mathematics.*  
 David Sattinger, Ph.D., *Assistant Professor of Mathematics.*  
 Murray Schacher, Ph.D., *Assistant Professor of Mathematics.*  
 Saharon Shelah, Ph.D., *Assistant Professor of Mathematics.*  
 James D. Stein, Jr., Ph.D., *Assistant Professor of Mathematics.*  
 James White, Ph.D., *Assistant Professor of Mathematics.*  
 William Wickless, Ph.D., *Assistant Professor of Mathematics.*  
 Guy H. Hunt, C.E., *Assistant Professor of Mathematics, Emeritus.*



- Leo Breiman, Ph.D., *Research Associate in Mathematics.*  
 Herbert B. Enderton, Ph.D., *Lecturer in Mathematics.*  
 Robert Herrera, M.A., *Lecturer in Mathematics.*  
 John McGhee, M.A., *Lecturer in Mathematics.*

**Preparation for the Major**

Courses 11A-11B-11C, 12A-12B-12C or the corresponding courses in the honors sequence. These courses must be completed with an average grade of C or higher. Prospective majors who qualify are strongly urged to take the honors sequence Mathematics 11AH-11BH-11CH, 12AH-12BH-12CH. Three courses in physical sciences other than mathematics; the courses may be in physics, astronomy, chemistry or meteorology; the general physical science sequence is also acceptable. Recommended: courses in physics. A reading knowledge of French, German or Russian is strongly recommended and the student should select his foreign language to this end.

**Transfer Students**

Transfer students must consult with a departmental adviser at their earliest opportunity. Particular areas where evaluation and direction may be necessary are linear algebra and differential equations. Students with less than a half-course credit of linear algebra should plan to take course 12A. The requirement for linear algebra may also be satisfied by taking a final examination for course 12A. Those with more than a half course but less than a full course should discuss with a departmental adviser their eligibility for entrance to course 115. Students with a half course or more of differential equations may upon the approval of an

adviser satisfy the requirements for course 130A by taking course 133.

**The Major in Mathematics**

Courses 110A, 115, 120A, 130A, 131A, and at least five additional courses in the 100 series numbered higher than 105. (Students who took 101A, Summer or Fall 1969, or 101B, Winter or Spring 1970 are exempted from the 110A requirements.) At least one course must be the B course in a sequence. Highly recommended for students who may wish to obtain a graduate degree: courses 110B-110C, 131B.

**Undergraduate Honors Program**

A student majoring in mathematics and wishing to graduate with Honors in Mathematics should apply for admission to the Honors Program. This may be done any time after the fifth undergraduate quarter. Minimum entrance requirements for fifth quarter students are the completion of courses 11ABC and 12A with three A's and one B. Honors will be granted to students in the program who in addition to the usual course requirements: (a) complete courses 110BC and 131B or approved graduate substitutes; (b) complete course 190, Honors Mathematics Seminar; (c) earn a grade point average of at least 3.6 in upper division and graduate mathematics courses. Students who demonstrate exceptional ability will be awarded High Honors.

**Departmental Scholar Program**

This program allows exceptionally promising undergraduates to enroll in graduate courses and begin work towards the Master's degree see pages 153-154.

**The Major in the Teaching of Mathematics**

Courses 101A-101B-101C, 102A-102B-102C, 370 and at least three other courses in the 100 series beyond 105. Highly recommended are courses 106, 115, 130A, 152A. Other recommended courses include 107, 111A-111B-111C, 120A-120B-120C, 130B-130C, 132, 152B.

**The Joint Major in Mathematics-Computer Science**

This is described on page 75.

**The Joint Major in Mathematics-System Science**

This is described on page 76.

**The Teaching Minor**

Course 370 and seven and a half additional courses. The courses recommended for candidates for the standard secondary credential are 1, 2A-2B-2C or 3A-3B-3C or 11A-11B-11C, 50, 103A-103B. Students are required to consult a departmental adviser. Lists of recommended courses for other credentials are available from departmental advisers or the School of Education.

**Conflicts or Duplication of Calculus Sequences**

Since each of the sequences 2A-2B-2C, 3A-3B-3C, 11A-11B-11C-12A-12B-12C, 11A-11B-11C-13A-13B-13C has been designed in accordance with the requirements of majors in a particular group of departments, it will be difficult for students to transfer from one sequence to another. Good students who wish to pursue advanced mathematics should be able to enter 12A or 13A after completing 3C. Students wishing to continue in mathematics after completing 2C should take 3C, followed by 12A or 13A. Only one of courses 2B, 3A, or 11A, and only one of courses 2C, 3B, and 11B may be taken for credit. Other changes should be made only with the concurrence of a departmental adviser who will determine the total allowable credit. Similar caution applies to transfer students entering with incomplete calculus sequences. Such students should be prepared to supply complete information as to texts used and chapters covered in their previous work. A placement examination, described below, may be required.

**Undergraduate Placement Examinations**

An examination covering high school algebra and trigonometry is given in the fall and spring quarters during registration week. The exact time and place will be posted on the departmental bulletin board. This examination determines which students may be exempt from the prerequisites to courses 2A, 3A, 11A and which students are to be considered for course 11AH. No permanent records are kept and no penalty is attached to poor performance on this examination.

Entering students who have passed the Advanced Placement AB or BC Test with a score of 3, 4, or 5 receive 10 units of credit. Such students may enroll in 11AH. Students who have scored 3, 4, or 5 on the BC test should discuss with a departmental adviser the possibility of enrolling directly in 12A. Students who have scored 3, 4, or 5 on the AB test should discuss with a departmental adviser the possibility of enrolling directly in 11B or 11C.

A student entering from high school who believes that he knows the equivalent of a course offered by the Department of Mathematics may demonstrate his proficiency in this course by examination. If, in the opinion of the Department, his level of achievement is sufficiently high, he will be permitted to enter the next course in the sequence. No University credit is earned by passing such an examination. Arrangements for such an examination must be made with the Department secretary in room 6356, Mathematical Sciences Building, on or before the Monday of registration week. Departmental advisers may request transfer students to take similar examinations as an aid in determining the correct sequence and course for initial placement.

**Requirements for the Master's Degree**

Candidates for the degree of Master of Arts in mathematics must qualify under The Comprehensive Examination Plan. For the general requirements, see page 155. Eleven quarter courses must be offered. One alternative is to offer eight or more courses in the graduate list; the remainder may be approved upper division courses. The other alternative involves the preparation of a report under the direction of some member of the Department. This is a project designed to train the student in independent study of mathematical literature and the reduction to orderly form of the knowledge thus gained. This alternative requires six or more graduate courses and the remainder approved un-



dergraduate courses; the preparation of the report may be given credit as one of the graduate courses. The candidate must pass a set of qualifying written examinations, one in basic analysis and one in basic algebra.

#### Requirements for the Master of Arts in Teaching (M.A.T.) Degree

The Department also offers a program leading to the degree of Master of Arts in Teaching (M.A.T.). Seven courses in mathematics are required, of which six are in the 200 series. Recommended are several courses of particular value to teachers, one of which leads to the preparation of a Master's essay. In addition, three courses in the Department of Education are required, as well as the course in supervised teaching. The comprehensive examinations cover both subject matter based upon the mathematical requirements and the content and philosophy of school mathematics. A variation of this program is available for those interested in a junior college credential.

#### Requirements for the Doctor's Degree

The requirements are, in general, in accordance with those listed under general requirements for the doctor's degree, pages 156-160. At present, the qualifying examinations which must be taken within the Department before the student is advanced to candidacy consist of an examination divided into four parts. The parts consist of (1) algebra, (2) real analysis, (3) complex analysis, and (4) mathematical electives. These written examinations are given twice each year; the student normally should take them during his second year of graduate study. As an additional requirement for the Ph.D. degree, students are required to actively participate in two seminars during the course of their graduate study. A student pursuing the Ph.D. degree can obtain a Master's degree by fulfilling the eleven course requirement, and by passing the Ph.D. algebra qualifying examination and one of the other Ph.D. qualifying examinations.

#### Applied Mathematics Program

An interdisciplinary program in applied mathematics leading to a Ph.D. degree is available. Three qualifying examinations are required before the student is advanced to candidacy: one in real and complex analysis, one in the specialized field, and one chosen from applied algebra, applied analysis, or statistics and random processes. There is considerable flexibility, both with respect to

examinations and programs. A student pursuing the Ph.D. degree in Applied Mathematics can obtain a Master's degree by fulfilling the eleven course requirement and by passing the Applied Algebra and Applied Real and Complex qualifying examinations.

#### Foreign Language

No foreign language is required for the M.A. degree. For the Ph.D. degree, one foreign language is required. Preferred languages are French, German and Russian.

#### Lower Division Courses

##### 1. College Algebra.

Not open for credit to students who have credit for other mathematics courses except 38, 50 and 100. Sets, real and complex numbers, fundamental operations, inequalities, relations and functions, set functions, polynomial, exponential, and trigonometric functions and their graphs; matrices, determinants, permutations, combinations, binomial theorem, sequences and series.

##### 2A-2B-2C. Mathematics for Social Science Students.

Prerequisite: three years of high school mathematics or course 1. 2A: finite mathematics consisting of elementary logic, sets, combinatorics, probability, vectors and matrices. 2B: functions, graphs, differentiation and integration with applications, transcendental functions. 2C: sequences and series, functions of several variables, further applications of the calculus.

##### 3A-3B-3C. Calculus for Life Science Students.

Prerequisite: three years of high school mathematics (including trigonometry) or course 1 or 2A. Course 3A is not open for credit to students with credit in another calculus sequence. 3A: techniques and applications of the differential calculus. 3B: techniques and applications of the integral calculus. 3C: may be taken after course 2C. Functions of several variables, vectors, partial differentiation, and multiple integration.

##### 11A-11B-11C. Calculus and Analytic Geometry—Initial Sequence.

Prerequisite: at least three years of high school mathematics including some coordinate geometry and trigonometry, or the passing of a special examination. 11A: Introduction to differentiation and integration with applications. 11B: Transcendental functions, extremal problems, techniques and applications of integration, elementary differential equations. 11C: Vectors and curves in two and three dimensions, infinite series.

##### 11AH-11BH-11CH. Calculus and Analytic Geometry—Initial Honors Sequence.

Prerequisite: satisfactory performance on a placement examination and consent of the instructor. An honors sequence parallel to 11A-11B-11C.

##### 12A. Linear Algebra, First Course.

Prerequisite: course 11C, or 3C or consent of instructor. Linear algebra, including real vector spaces, linear transformations, matrices and determinants.

**12AH. Linear Algebra, Honors Sequence.**

Prerequisite: course 11CH, or 11C with grade A or consent of the instructor. An honors course parallel to 12A.

**12B–12C. Vector Differential and Integral Calculus.**

Prerequisite: course 12A. 12B: vector differential calculus, line integrals, Green's theorem. 12C: multiple integration, surface integrals, Stokes' theorem.

**12BH–12CH. Vector Differential and Integral Calculus, Honors Sequence.**

Prerequisite: course 12AH, or 12A with a grade A or consent of the instructor. An honors sequence parallel to 12B–12C.

**13A–13B–13C. Intermediate Calculus and Applications.**

Prerequisite: course 11C, 3C or consent of the instructor. 13A: linear differential equations and partial differentiation and applications. 13B: Laplace transforms, power and Fourier series, differential equations with variable coefficients. 13C: line and surface integrals, vector field theory, linear algebra.

**15. Lower Division Seminars.**

Prerequisite: Consent of the instructor. Each quarter the Department will offer a limited number of seminars in various branches of mathematics. The method of teaching will involve substantial student participation and enrollment will be limited to 15 students. Course may be repeated for credit.

**38. Fundamentals of Arithmetic.**

Prerequisite: sophomore standing. Designed for prospective teachers of arithmetic. The study of the structure of the real numbers. Theory of the structure, arithmetic and algebra of the real number system, together with suitable visual aids. Although efficiency in arithmetical skills is required, the emphasis is on the understanding of arithmetical procedures.

**50. Elementary Statistics.**

(Formerly numbered Statistics 1.) Not open for credit to students having credit for an advanced statistics course. Emphasis is placed on the understanding of statistical methods. Topics covered are empirical and theoretical frequency distributions, sampling, estimation, hypothesis testing, correlation, regression, modern techniques.

**60. Introduction to Mathematical Methods of System Science.**

Prerequisites: Mathematics 12A–12B; Mathematics 12C (may be taken concurrently); Physics 7B. Intended for students interested in preparing for the Mathematics-System Science interdepartmental major. Selected introductory topics pertinent to the analysis of signals, networks, control systems, automata, information transmission.

## Upper Division Courses

**GENERAL AND TEACHER TRAINING****100. The Nature of Mathematics.**

Prerequisite: junior standing. Not open to students majoring in mathematics, engineering, or physical science. A course designed to acquaint students in the arts, humanities, and social sciences with the nature of modern mathematics and the mathematical method.

**101A–101B–101C. Topics in Algebra.**

Prerequisite: course 12A. 101A is not open to students having credit for course 110A. A sequence intended primarily for prospective secondary teachers. Group theory, numbers and number systems, relations and equivalence, topics from elementary number theory, the rational numbers, integral domains, rings and fields, the real numbers, cardinals, complex numbers, polynomials, vector spaces, nonconstructibility, nonsolvability.

**102A–102B–102C. Topics in Geometry.**

Prerequisite: course 12C. A sequence intended primarily for prospective secondary teachers. Axiomatic methods, advanced topics in Euclidean geometry, hyperbolic and other geometries, constructions, symmetries, isometry and related topics, projective geometry, map coloring, Jordan curve theorem.

**103A–103B. Fundamental Concepts of Algebra and Geometry.**

Prerequisite: course 2C or 3B. Designed for the general secondary candidate with a mathematics minor who is not majoring in one of the physical sciences. Number systems, logical concepts, algebraic operations, determinants and matrices. Deductive geometry, axiomatic approach and application to Euclidean geometry, non-Euclidean geometry, projective, metric, and affine geometry.

**106. History of Mathematics.**

Prerequisite: course 11C or 3C. Topics in the history of mathematics with emphasis on the development of modern mathematics.

**107. Mathematical Ideas.**

Prerequisite: course 12C or 13C. Postulational methods, sets, equivalence, cardinals; number systems, integers, reals, complex numbers; geometry, Euclid's axioms, alternative systems, non-Euclidean spaces; functions and limits; topology of convex sets, convex functions, fixed point theorem, fundamental theorem of algebra and related concepts.

**ALGEBRA, NUMBER THEORY AND LOGIC****110A. Algebra. Groups.**

Prerequisite: course 12A. Course 110A is not open to students having credit for Mathematics 101A. Integers, groups and their structures.

**110B. Algebra. Rings.**

Prerequisite: course 110A. Rings, ideals, polynomials, factorization.

**110C. Algebra. Fields.**

Prerequisite: course 110B. Field extensions, Galois theory, applications to geometric constructions and solvability by radicals.

**111A–111B–111C. Theory of Numbers.**

Prerequisite: course 12A or consent of the instructor. Divisibility, congruences, Diophantine analysis, selected topics in the theory of primes, algebraic number theory, Diophantine equations.

**112A–112B–112C. Set Theory and Logic.**

Prerequisite: course 12 or consent of the instructor. Course 112A deals with informal axiomatic set theory presented as a foundation for modern mathematics. 112B and 112C cover predicate logic, formalized theories. Gödel's completeness and incompleteness theorems.

**113. Combinatorics.**

Prerequisite: course 12A. Permutations and combinations, counting principles, recurrence relations and generating functions, combinatorial designs, graphs and trees, with applications including games of complete information. Combinatorial existence theorems, Ramsey's theorem.

**114. Theory of Computability.**

Prerequisite: upper division standing or consent of the instructor. Machines and recursive functions. Church's thesis. Gödel numbers, enumeration theorem, universal machines. Unsolvable problems. Relative recursiveness. Further topics selected from: word problems, arithmetical relations, subrecursive hierarchies, primitive recursive functions, computational complexity.

**115. Linear Algebra. Second Course.**

Prerequisite: course 12A. Abstract vector spaces; linear transformations and matrices; determinants; similarity; eigenvalues and eigenvectors; Jordan form; inner product spaces; quadratic forms.

**GEOMETRY AND TOPOLOGY**

**120A-120B. Differential Geometry.**

Prerequisite: course 12C or 13C. Curves in 3-space, Frenet formulas, surfaces in 3-space, normal curvature, Gaussian curvature. Congruence of curves and of surfaces. Intrinsic geometry of surfaces, isometries, geodesics, Gauss-Bonnet theorem.

**121. Introduction to Topology.**

Prerequisite: course 131A. Metric and topological spaces, topological properties, completeness, mappings and homeomorphisms, the metrization problem.

**ANALYSIS**

**131A-131B. Analysis.**

Prerequisite: Course 12C or 13C. 131A: Completeness of the real line; countable and uncountable sets; neighborhoods, open, closed, compact, and connected sets; continuous functions of one variable; convergence of sequences and series, uniform convergence; differentiation on the line. 131B: Riemann-Stieltjes integration; differentiation and integration of sequences of functions; metric space theory; Stone-Weierstrass and fixed point theorems; inverse and implicit function theorems.

**131C. Integration on Manifolds.**

Prerequisite: Course 131B; course 115 recommended. Integration theory for functions of several variables, multilinear algebra, differential forms, Stokes' Theorem on manifolds.

**132. Introduction to Complex Analysis.**

Prerequisite: course 12C or 13C. Complex numbers, functions, differentiability, series, extensions of elementary functions, integrals, calculus of residues, conformal maps and mapping functions with applications.

**133. Differential Equations. (1/4 course)**

Prerequisite: course 12C or 13C. Not open for credit for students having credit for course 130A. A course primarily intended for transfer students with credit for less than one course in differential

equations. Existence and uniqueness theorems for differential equations.

**134. Measure and Integration.**

Prerequisite: Course 131B or consent of the instructor. An introduction to Lebesgue measure and integration.

**APPLIED MATHEMATICS**

**140A-140B-140C. Numerical Analysis.**

(Formerly numbered 135A-135B.) Prerequisite: course 130A. Interpolation and approximation, numerical differentiation and integration, solution of nonlinear equations, error analysis; numerical methods in linear algebra; numerical methods in ordinary differential equations.

**143. Analytic Mechanics.**

Prerequisite: course 130A. Foundations of Newtonian mechanics, kinematics and dynamics of a rigid body, variational principles and Lagrange's equations; calculus of variations, variable mass; related topics in applied mathematics.

**144. Theory of Games and Linear Programming.**

Prerequisite: course 12A. The basic theorems of two person zero-sum matrix games including the minimax theorem; applications to games of chance and strategy; principles of linear programming, the duality theorem, and simplex methods; applications to industrial and business problems.

**145A-145B. Methods of Applied Mathematics.**

Prerequisites: course 130A, or 13C and consent of the instructor. Calculus of variations, linear integral equations (Volterra and Fredholm) and applications to differential equations, Fourier series and integrals, elements of tensor calculus, special topics as time permits.

**PROBABILITY AND STATISTICS**

**150A-150B-150C. Probability and Statistics.**

Prerequisite: course 12C or 13C. 150A: an introduction to probability. 150B: an introduction to mathematical statistics. 150C: the elementary aspects of stochastic processes with an emphasis on Markov chains.

**152A-152B. Applied Mathematical Statistics.**

Prerequisite: course 12C or 13C or consent of the instructor. Credit will not be allowed for both course 152A and 150B. A basic introductory course in the theory and application of statistical methods. This course is designed for students who wish to learn statistical methods without first taking a course in probability and who are interested in applications.

**190. Honors Mathematics Seminar.**

Prerequisite: admission to Mathematics honors program and consent of the instructor. A participating seminar on advanced topics in mathematics.

**191. Upper Division Seminars.**

Prerequisite: Course 12C and consent of the instructor. Each quarter the Department will offer a limited number of seminars in various branches of mathematics. The method of teaching will involve substantial student participation and enrollment will be limited to 15 students. Course may be repeated for credit.

**199. Special Studies in Mathematics.**

(¼ to 1 course)

Prerequisite: approval of the chairman and consent of the instructor. At the discretion of the chairman and subject to the availability of staff, individuals or groups may study topics suitable for undergraduate course credit but not specifically offered as separate courses. Course may be repeated for credit.

Graduate Courses

**TEACHER PREPARATION****201A–201B–201C. Topics in Algebra and Analysis.**

Prerequisite: B.A. degree with mathematics major or equivalent. A course designed for students in the mathematics-education program. Important ideas of algebra, geometry and calculus leading effectively from elementary to modern mathematics. Approaches to the number system, point sets, geometric interpretations of algebra and analysis, integration, differentiation, series and analytic functions.

**202A–202B. Mathematical Models and Applications.**

Prerequisite: B.A. degree with mathematics major or equivalent. A course designed for students in the Mathematics-Education program. A development of mathematical theories describing various empirical situations. Basic characterizing postulates are discussed and a logical structure of theorems developed. Modern topics such as operations research, linear programming, game theory, learning models, models in social and life sciences.

**NUMBER THEORY****205A–205B–205C. Number Theory.**

Prerequisite: courses 246A and 210A or consent of the instructor. Topics from analytic algebraic and geometric number theory, including distribution of primes and factorization in algebraic number fields. Also selected topics from additive number theory, Diophantine approximation, partitions, class-field theory, lattice point problems, valuation theory, etc.

**206. Combinatorics.**

Prerequisite: consent of the instructor. Selected topics from: combinatorial structures and their automorphism groups; counting principles of Sylvester and Pólya; partitions, coloring problems, binary structures, polyhedral structures, generating functions, combinatorial problems in geometry, number theory and statistics.

**ALGEBRA****210A–210B–210C. Algebra.**

Prerequisite: courses 110A–110B–110C or consent of the instructor. Students may not receive credit toward the Master's degree for both 210B and 110B and/or 210C and 110C. Group theory including the theorems of Sylow and Jordan-Hölder-Schreier; rings and ideals, factorization theory in integral domains, modules over principal ideal rings, Galois theory of fields, multilinear algebra, structure of algebras.

**211. Structure of Rings.**

Prerequisite: course 210A or consent of the instructor. The radical, irreducible modules and primitive rings, rings and algebras with minimum condition.

**212. Homological Algebra.**

Prerequisite: course 210A or consent of the instructor. Modules over a ring, homomorphisms and tensor products of modules, functors and derived functors, homological dimension of rings and modules.

**213A–213B. Theory of Groups.**

Prerequisite: course 210A or consent of the instructor. Topics chosen from representation theory, transfer theory, infinite Abelian groups, free products and presentations of groups, solvable and nilpotent groups, classical groups, algebraic groups.

**214A–214B. Algebraic Geometry.**

Prerequisite: course 210A or consent of the instructor. Preliminaries from the theory of commutative rings and algebras. Theory of algebraic varieties. Topics chosen from plane curves, resolution of singularities, invariant theory, intersection theory, divisors and linear systems.

**LOGIC AND FOUNDATIONS****220A. Mathematical Logic. Model Theory.**

Prerequisite: courses 112A–112B–112C or equivalent. Algebraic operations on models; the compactness theorem and applications; elementary submodels and extensions; the Lowenheim-Skolem theorems; saturated and special models and applications; properties preserved under algebraic operations; definability; cardinality problems; categoricity; model theory for richer than first-order languages.

**220B. Mathematical Logic. Decidability and Undecidability.**

Prerequisite: course 220A or consent of the instructor. The Gödel incompleteness theorem for arithmetic and related first-order theories; proofs of undecidability; tests and methods for proving completeness; the decision problem for certain theories, including possibly the more advanced topics of real closed fields, the word problem for groups, and Hilbert's tenth problem.

**220C. Mathematical Logic. Recursive Functions.**

Prerequisite: course 220B or consent of the instructor. Recursive functions and predicates; computability and recursiveness (Church's thesis); the arithmetical hierarchy; Post's theorem; partial recursive functions and functionals; the analytical hierarchy; the hyperarithmetical hierarchy; possibly other advanced topics, for example, in the analytical hierarchy, in classical set theory, and in model theory.

**221A–221B–221C. Set Theory.**

(Same as Philosophy 221A–221B–221C.) Prerequisite: course 112A or Philosophy 134. Students may not receive credit for both Mathematics 221A–221B–221C and Philosophy 221A–221B–221C. Sets, relations, functions. Partial and total orderings; well-orderings. Ordinal and cardinal arithmetic, finiteness and infinity, the continuum hypothesis, inaccessible numbers. Formalization of set theory, Zermelo-Fraenkel theory, von Neumann-Gödel theory. Constructibility. Results on relative consistency and independence.

**222A–222B. Distributive Lattices and Boolean Algebras.**

Prerequisite: course 121 or 235A or consent of the instructor. Partially ordered sets, lattices, distribu-

tivity laws, completeness properties, ideal theory, Heyting algebras, Boolean algebras, closure algebras, representation theory, applications to topology and logic.

**223. Advanced Topics in Mathematical Logic.**

Prerequisite: consent of the instructor. Content will vary from quarter to quarter.

**GEOMETRY**

**225. Differentiable Manifolds.**

Prerequisite: course 131A or 120A-120B. Fundamentals of manifold theory: vector fields and integral curves, the calculus of differential forms. Submanifolds, Frobenius theorem. Stokes' theorem. Mappings, covering manifolds.

**226A-226B-226C. Differential Geometry.**

Prerequisite: course 225 or consent of the instructor. Connections, curvature and torsion, covariant differentiation, holonomy, Riemannian geometry, completeness manifolds of constant curvature. Variation theory of geodesics; conjugate points, Myers and Synge theorems. Isometric imbeddings. Selections from Kähler manifolds, symmetric spaces, or the generalized Gauss-Bonnet theorem.

**227A-227B. Fibre Bundles.**

Prerequisite: course 225, and for 227B one quarter of algebraic topology. Principal bundles, associated bundles, bundle maps. Coset manifolds, covering spaces. Vector bundles, characteristic classes, the Euler class. Sheaves, de Rham theorem.

**228A-228B. Convex Sets.**

Prerequisite: course 121 or 245A or consent of the instructor. Basic concepts for convex sets in topological linear spaces; separation theorems and support functions; local convexity; convex functions; Helly type theorems; duality. Course 228B will contain selected topics from current literature on convexity and research problems.

**229A-229B. Lie Groups.**

Prerequisite: course 225. Lie algebra of a Lie group, exponential mapping, analytic homomorphisms, covering groups. The correspondence between subalgebras and subgroups. Classical groups. Semisimple groups and algebras.

**TOPOLOGY**

**235A-235B. Topology.**

Prerequisite: courses 131A-131B and 110A or consent of the instructor. Students may not receive credit toward the Master's degree for both 235A and 121. Sets and functions, spaces and maps, sum and product of spaces, quotient spaces, homotopy and isotopy; separation axioms, compactness, convergence, connectedness; embedding and extension theorems, metrizable and metric spaces; polyhedra, fundamental groups.

**236. General Topology.**

Prerequisite: course 121 or 235A, or consent of the instructor. Topics in nonalgebraic topology, e.g., function spaces, uniform spaces, introduction to dimension theory.

**237A-237B. Homology Theory.**

Prerequisite: course 235B or consent of the instructor. Axioms of homology theory, computation of homology groups; singular theory; Čech theory;

simplicial or cellular theory; cup and cap products, cohomology operations; duality theorems; further topics.

**238A-238B. Homotopy Theory.**

Prerequisite: course 235B or consent of the instructor. Main problems in homotopy theory and their relations; Hopf theorems; fiber spaces, covering spaces; homotopy groups, axiomatic approach,  $n$ -connective fiberings, Freudenthal's suspensions; obstruction theory; exact couples and spectral sequences.

**ANALYSIS AND DIFFERENTIAL EQUATIONS**

**245A-245B-245C. Real Analysis.**

Prerequisite: courses 131A-131B and course 121 or the equivalent. E.g., 235A can be taken concurrently). Abstract integration theory, convergence theorems, regular Borel measures, Riesz representation theorem, elementary Hilbert space theory, Banach space techniques,  $L^p$ -spaces, Radon-Nikodym theorem, Fubini theorem, differentiation of set functions, special topics.

**246A-246B-246C. Complex Analysis.**

Prerequisite: courses 131A-131B-131C. Students may not receive credit toward the Master's degree for both 246A and 132. Introduction to the rigorous theory of functions of a complex variable. Linear fractional transformations, conformal mappings, general form of Cauchy's theorem, calculus of residues, power series, partial fractions, infinite products, Riemann mapping theorem, Dirichlet problem, analytic continuation, monodromy theorem.

**247A-247B-247C. Advanced Topics in Modern Complex Analysis.**

Prerequisite: courses 245A-245B-245C and 246A-246B-246C or consent of the instructor. Introduction to current problems and methods selected from higher complex analysis, e.g., Riemann surfaces, Riemannian spaces, several complex variables, quasiconformal mappings, subharmonic functions, harmonic functions and forms, compactifications, elliptic equations, applications of functional analysis. The content of the course varies from year to year.

**248A-248B. Trigonometrical Series.**

Prerequisite: course 246A or 245A, taken previously or concurrently; or consent of the instructor. Selected topics in Fourier series, power series, orthogonal polynomials, almost periodic functions, and completeness of sets of functions.

**249A-249B-249C. Calculus of Variations and Optimal Control Theory.**

Prerequisite: courses 246A, 245A, or consent of the instructor. Conditions for minima or maxima of functionals. The problems of Lagrange, Bolza, and Mayer, with or without inequality constraints. Mathematical aspects of optimal control theory. Multiple integral problems. The theory of quadratic forms in Hilbert space with applications to elliptic partial differential equations. Existence theorems.

**250A. Differential Equations.**

Prerequisite: course 246A. Basic theory of ordinary differential equations. Existence and uniqueness of solutions. Continuity with respect to initial conditions and parameters. Linear systems and  $n$ -th order equations. Analytic systems with isolated singularities of the first and second kind. Self-adjoint boundary value problems on finite intervals.

**250B. Differential Equations.**

Prerequisite: course 250A. Basic results for partial differential equations. Cauchy-Kowalewski theorems. Classification of second order differential operators. Basic classical theory of the Laplace equation (potential theory), the heat equations, and the wave equations.

**250C. Nonlinear Ordinary Differential Equations.**

Prerequisite: course 250A. Asymptotic behavior of nonlinear systems. Stability. Existence of periodic solutions for nonautonomous and autonomous systems. Perturbation theory of two-dimensional real autonomous systems. The Poincare-Bendixson theory. Differential equations on a torus.

**250D. Spectral Theory of Ordinary Differential Operators.**

Prerequisite: courses 250A and 255A. Singular self-adjoint boundary value problems for second-order equations. Symmetric, self-adjoint, formally normal, and normal unbounded operators in Hilbert space. Formally normal ordinary differential operators. Characterization of normal extensions in terms of boundary conditions. Eigenfunction expansions for symmetric ordinary differential operators.

**250E. Partial Differential Operators with Constant Coefficients.**

Prerequisite: courses 250B and 255A. General theory of constant coefficient partial differential operators of arbitrary order, including existence of a fundamental solution, strengths of operators, approximation of solutions of homogeneous equations, ellipticity and hypo-ellipticity. Equations with no solution. Elements of the theory of distributions.

**250F. Advanced Topics in Partial Differential Equations.**

Prerequisite: course 250E or consent of the instructor. Topics selected from elliptic boundary value problems, semigroups and parabolic equations, the Cauchy problem for hyperbolic systems, nonlinear partial differential equations.

**FUNCTIONAL ANALYSIS****255A-255B-255C. Functional Analysis.**

Prerequisite: courses 245A-245B-245C and 246A. Basic principles of Banach spaces, Hilbert space and linear topological vector spaces; weak topologies, separation theorems, linear operators, spectral theory, Banach algebras; further topics.

**256. Topological Groups.**

Prerequisite: courses 245A-245B-245C and 235A. An introduction to the structure and representation theories for topological groups.

**257. Abstract Harmonic Analysis.**

Prerequisite: consent of the instructor. Selected topics in the harmonic analysis of locally compact groups.

**258A-258B. Topological Linear Algebras.**

Prerequisite: courses 255A-255B-255C. Representation of, and approximation in, certain Banach algebras. Operational calculus for several elements. Extension problems. Analytic function algebras.

**259A-259B. Operator Algebras in Hilbert Space.**

Prerequisite: courses 255A-255B-255C. Selected topics from the theories of  $C^*$  and von Neumann algebras. Applications.

**APPLIED MATHEMATICS****265A-265B-265C. Applied Real and Complex Analysis.**

Prerequisite: course 131A or 131B or consent of the instructor. Students may not receive credit toward the Master's degree for any quarter of 265 and 245A, 245B, 246A, 246B, 131C, and 132. This is an integrated course in real and complex analysis developing concepts most frequently applied in physical sciences. Measure theory, Lebesgue integration, Fubini's theorem,  $L^p$ -spaces. Fourier series, Fourier transforms, basic complex function theory, residues and integrals.

**266A-266B-266C. Classical Applied Mathematics.**

(Same as Physics 231A-231B-231C.) Prerequisite: consent of the instructor. Students may not receive credit for both Mathematics 266A-266B-266C and Physics 231A-231B-231C. Linear operators, review of functions of a complex variable, integral transforms. Partial differential equations, ordinary differential equations. Calculus of variations. Perturbation theory, singular integral equations, numerical methods.

**267A-267B. Applied Algebra.**

Prerequisite: course 110A or the equivalent. Students may not receive credit toward the master's degree for 267A and 210A. Linear algebra, eigenvalues and quadratic forms; linear inequalities, finite fields and combinatorial analysis. Group theory, with emphasis on representations. Application to physical problems.

**268A-268B-268C. Applied Functional Analysis.**

Prerequisite: courses 245A and 265A, or consent of the instructor. Students may not receive credit toward the master's degree for 268A and 255A. Linear vector spaces, inner products, norms, completeness, linear functionals and linear operators, spectral theory of operators, eigenvalue problems for differential equations. Partial differential equations, generalized functions, applications.

**269A-269B-269C. Advanced Numerical Analysis.**

Prerequisite: knowledge of coding, courses 110A, 140A-140B-140C, 131A-131B, or consent of the instructor. Analysis of numerical methods for solving linear and nonlinear systems. Numerical methods for finding eigenvalues and eigenvectors. Computational aspects of partial differential equations, finite difference methods, stability, error analysis, and related topics. Suitability of methods for digital computers.

**270A-270B. Approximation Theory.**

Prerequisite: courses 140A-140B-140C or consent of the instructor. Existence, uniqueness and characterization of best approximants; the relevant spaces. Infra-functions. Unisolvence. Smoothing. Approximation in the complex and in geometry. Incompatible systems. Rational and harmonic approximation. Convergence. Classes of approximates. Deviator integrals.

**271A. Tensor Analysis.**

Prerequisite: course 131A–131B or consent of the instructor. Algebra and calculus of tensors in  $n$ -dimensional manifolds. Applications to geometry of curves and surfaces embedded in 3-dimensional Euclidean manifolds.

**271B. Analytical Mechanics.**

Prerequisite: course 271A and some knowledge of mechanics. Newtonian and Lagrangian equations. Hamilton's principle. Principle of least action. Holonomic and nonholonomic systems. Hamilton's canonical equations, contact transformations, applications.

**271C. Introduction to Relativity.**

Prerequisite: course 271A and some knowledge of mechanics. Restricted theory of relativity. Extensions to general theory. The relativistic theory of gravitation.

**272A. Fluid Mechanics.**

Prerequisite: consent of the instructor. Fundamentals of the dynamics of fluid flows, an introduction to the mathematical approach to physical problems.

**272B. Rotating Fluid Dynamics.**

Prerequisite: course 272A or equivalent. Steady and transient flows of homogeneous and stratified fluids. Wave propagation. Model of geophysical phenomena.

**272C. Instability, Waves and Turbulence.**

Prerequisite: consent of the instructor. Nonlinear processes arising from postinstability stage of equilibrium solutions, dynamics of interacting dispersive and nondispersive waves, the closure of the statistical problem, etc. Perturbation techniques used in these problems will be discussed.

**272D. Introduction to Elasticity.**

Prerequisite: course 271A or consent of the instructor. A study of classical theory of elasticity, analysis of stress and strain. Field equations of elastostatic and elastodynamics, Saint Venant's torsion and flexure problems.

**273. Wave Mechanics.**

Prerequisite: consent of the instructor. Differential geometry of dynamical systems, particularly with curved time-space, both Newtonian and Lorentzian. Construction of undular counterparts of such systems, and the correspondence principle. Spinor fields, and other topics selected by the instructor.

**PROBABILITY AND STATISTICS**

**275A–275B–275C. Probability Theory.**

Prerequisite: courses 245A–245B. Review of essential material in measure and integration. Distribution and characteristic functions. Sums of independent random variables. Central limit theorems. Ergodic theorems. Martingale theorems. Brownian motion.

**276A–276B–276C. Statistical Inference.**

Prerequisite: courses 150A–150B, or 152A–152B and courses 131A–131B. Decision theory, the minimax and complete class theorems, the Neyman-Pearson theory of testing hypotheses, unbiased and invariant tests and estimates; applications to experimental designs, sequential analysis, and nonparametric inference.

**277. Mathematical Theory of Design of Experiments.**

Prerequisite: courses 150A–150B, or 152A–152B, or consent of the instructor. Advanced statistical theory basic to the construction of experimental designs. Criteria for optimum designs. Methods of application to typical research problems.

**278A–278B. Classical Methods of Statistics.**

Prerequisite: courses 150A–150B or 152A–152B, and courses 131A–131B. Large sample theory, regression theory, nonparametric methods, multivariate analysis.

**285. Seminars. (1 course each)**

Prerequisite: consent of instructor. No more than two 285 courses can be applied toward the Master's degree course requirement, except by prior permission of the Vice-Chairman for Graduate Studies. Topics in various branches of mathematics and their applications by means of lectures and informal conferences with members of the staff.

285A. Seminar in the History and Development of Mathematics.

285B. Seminar in Number Theory.

285C. Seminar in Algebra.

285D. Seminar in Logic.

285E. Seminar in Geometry.

285F. Seminar in Topology.

285G. Seminar in Analysis.

285H. Seminar in Differential Equations.

285I. Seminar in Functional Analysis.

285J. Seminar in Applied Mathematics.

285K. Seminar in Probability.

285L. Seminar in Statistics.

**290. Seminar in Current Literature.**

A seminar for Ph.D. candidates. Readings and presentations of papers in mathematical literature under the supervision of a staff member.

**Professional Course in Method**

**370. The Teaching of Mathematics.**

Prerequisite: course 12A or 2C or 3C and senior standing. A critical inquiry into present-day tendencies in the teaching of mathematics.

**Individual Study and Research**

**596. Directed Individual Study or Research.**

( $\frac{1}{2}$  to 1 course)

Supervised individual reading and study on a project approved by a faculty member, which may be preparation for the master's essay. May be taken multiply or repeated for credit, but only two such courses may be applied toward the master's degree unless departmental approval is obtained.

**596X. Directed Individual Study or Research.**

Individual study to prepare for foreign language examinations. May not be used for credit toward M.A. or M.A.T. degree. Registration is limited to three quarters.

**597. Preparation for Master's Comprehensive and Doctoral Qualifying Examinations.**

Individual study to prepare for comprehensive and qualifying examinations. May not be used for credit toward M.A. or M.A.T. degree. Registration is limited to one quarter.

**599. Research in Mathematics. ( $\frac{1}{2}$  to 2 courses)**

Study and research for the Ph.D. dissertation. May be taken multiply or repeated for credit.

## ■ MEDICAL HISTORY

(Department Office, 50-074 Center for the Health Sciences)

§ John Field, II, Ph.D., *Professor of Medical History and Physiology.*

Franklin D. Murphy, M.D., Sc.D., *Professor of Medical History.*

Hans Simmer, M.D., *Professor of Medical History, Obstetrics and Gynecology and Physiology in Residence.*

L. R. C. Agnew, M.D., *Associate Professor of Medical History.*

M. Peter Amacher, Ph.D., *Associate Professor of Medical History and Associate Professor of Biomedical Science in Residence.*

———, *Assistant Professor of Medical History.*



Elmer Belt, M.D., *Lecturer in Medical History and Clinical Professor of Surgery.*

Louise M. Darling, M.A., *Lecturer in Medical History and Library Service.*

Robert J. Moes, M.D., *Lecturer in Medical History.*

F. M. Valadez, Ph.D., *Acting Assistant Professor of Medical History.*

### Admission to Graduate Status

Candidates for admission to graduate status in the Department of Medical History must meet the general requirements set by the Graduate Division for admission to such status.

#### Requirements for the M.A. Degree

1. Requirements for admission will be such as have been established by the Graduate Division, with the further requirement that the program will be limited to those already possessing the M.D. or D.D.S. degree, or a Ph.D. degree in one of the basic medical or biological sciences.

2. The residence requirement will be a minimum of one year.

3. A reading knowledge normally of French or German will be required.

4. A minimum of nine courses (equalling 36 quarter units) will be required, and of these, five courses (equalling 20 quarter units) will be at the graduate level. The student will be required to pass an examination covering the general field of medical history.

#### Requirements for the Ph.D. Degree

1. The general requirements for admission to the Graduate Division must be met. Normally, students admitted to this program will hold the M.D. or D.D.S. degree, or an M.A. degree, including a background in a basic medical or biological science. Other students may be admitted with, for example, an M.A. degree in history, but will be required to take appropriate medical or biological courses as part of the program.

2. The minimum residence requirement will be two years.

§ Recalled to active duty.

3. Before taking the qualifying examination, the student will be required to demonstrate a reading knowledge of normally French and German. Other languages, such as Latin, might also be required depending upon the area or period emphasized by the student.

4. The program of study will be arranged in accordance with the student's academic background, to prepare him for the qualifying examination and for preparation of the dissertation. The qualifying examination will be divided into three parts: (a) a test of the student's general comprehension of the field of Medical History; (b) a more intensive test of his knowledge of a selected area within the general field of Medical History; (c) a test of his knowledge of one of the fields of the History of Science as already established at UCLA. This last test will be administered by whoever may be responsible for the subject. The fields of intensive examination within the history of medicine will be the following:

Medicine to 1600

Medicine in the 17th and 18th centuries

Medicine in the 19th and 20th centuries

Successful completion of the several parts of the written examination will be followed by an oral examination conducted by the student's advisory committee, composed of representatives of the History of Medicine and the History of Science, and any others deemed necessary as representatives of other disciplines in accordance with the student's program.

5. A dissertation on a subject related to the student's field of intensive study, approved by his advisory committee, will be required. The dissertation must be the result of orig-



inal research and constitute a genuine contribution to knowledge.

6. There will be a final, oral examination conducted by the student's advisory committee that will center on the dissertation and its relation to the field of intensive study.

Upper Division Courses

**107B. Historical Development of Medical Sciences.**

Three hours per week in the spring quarter. The major contributions of medicine and medical personalities from the 5th century B.C. to the 19th century A.D. Illustrated lectures and required readings from selected texts. Mr. Agnew, Mr. O'Malley

Graduate Courses

**240A-240B. History of Medical Sciences.**

(½ course each)

One hour per week in the winter and spring quarters. Survey of the development of scientific and medical thought from ancient times to the present. Mr. Field

**241A-241B. History of Clinical Sciences. (½ course each)**

One hour per week in the fall and winter quarters. Survey of the development of the clinical specialties and comparison of medical practice in western civilization with that developed in other parts of the world. Mr. Agnew

**242. History of Pathology. (¼ course)**

One hour per week in the fall quarter. Survey of the history of pathology and related sciences from antiquity to the 20th century, tracing the development of pathological theory, practice, organization and education and comparing them to current practice. Mr. Agnew

**243. History of Surgery. (¼ course)**

One hour per week in the winter quarter. Survey of the history of surgery and related sciences from antiquity to the 20th century, tracing the development of surgical theory, practice, organization and education and comparing them to current practice. Mr. Agnew

**244. History of American Medicine. (¼ course)**

One hour per week in the spring quarter. Survey of the history of medicine in the United States from the colonial period to the present. Mr. Agnew

**245. History of Ovarian Endocrinology. (½ course)**

One hour per week in the fall quarter. Open to medical students and qualified graduate students.

Survey of the development of ovarian endocrinology. Specific topics will be: Ovarian anatomy and histology; Oophorectomy; Transplantation of ovaries; Use of ovarian extracts; Isolation of estrogens; Function of the corpus luteum; Isolation of gestagens; Ovarian androgens; Gonadotropins and Hormonal contraception. Mr. Simmer

**246. History of Neurophysiology. (½ course)**

Eight lectures, 1 hour, covering the development of experimental neurophysiology from its scientific roots in the 17th century, through the recognition in the 18th century of the excitability of the nervous system, to the use of this characteristic for revealing the functions of spinal cord and brain. Mrs. Mary A. B. Brazier

**250. History of Neurology and Medical Psychology. (¼ course)**

One hour per week in the fall quarter. Lectures on the history of neurology and medical psychology from antiquity to the 20th century. The lectures discuss concepts held by medical scientists on the structure and function of the nervous system and on the interaction of mind and body, as well as the influence of these concepts on therapy of nervous and mental disorders. Mr. Amacher

**252A-252B. Seminar in Medical History.**

One 2-hour session per week in the fall and winter quarters. Prerequisite: ability to read at least one foreign language. Bibliography and readings, class discussion and papers on selected topics in the history of medicine: course, 252A, beginnings to 1600; course 252B, 1600 to present. Mr. Agnew

**253. Development of the Basic Medical Sciences and Their Impact Upon Clinical Medicine.**

Prerequisite: open to medical students and qualified graduate students. The influence of the basic medical sciences as they develop from the 16th to the 19th century upon clinical medicine, and demonstration of the resulting advancement of medicine. Mr. Agnew, Mr. Field, Mr. Simmer

**596. Directed Individual Studies in Medical History.**

Investigation of subjects in medical history selected by students with the advice and direction of the instructor in the fall, winter and spring quarters. Individual reports and conferences. Mr. Agnew, Mr. Field

**599. Research for and Preparation of the Doctoral Dissertation. (1 to 2 courses)**

Investigation of materials relative to the doctoral dissertation, their evaluation and written presentation. Mr. Agnew, Mr. O'Malley

**■ MEDICAL MICROBIOLOGY AND IMMUNOLOGY**

(Department Office, 43-239 Center for the Health Sciences)

Marcel A. Baluda, Ph.D., *Professor of Microbiology and Immunology.*

Ruth A. Boak, M.D., Ph.D., *Professor of Microbiology and Immunology, Pediatrics, and Public Health.*

John M. Chapman, M.D., *Professor of Microbiology and Immunology, Public Health, and Preventive Medicine and Public Health.*

William H. Hildemann, Ph.D., *Professor of Microbiology and Immunology.*

David T. Imagawa, Ph.D., *Professor of Microbiology and Immunology.*

- A. F. Rasmussen, Jr., M.D., Ph.D., *Professor of Microbiology and Immunology.*  
 Margret I. Sellers, Ph.D., *Professor of Microbiology and Immunology.*  
 Marietta Voge, Ph.D., *Professor of Microbiology and Immunology.*  
 Telford H. Work, M.D., *Professor of Infectious and Tropical Diseases in Medical Microbiology and Immunology, in Public Health, and Preventive Medicine.*  
 Stephen Zamenhof, Ph.D., *Professor of Microbial Genetics and Biological Chemistry.*  
 John F. Kessel, Ph.D., *Emeritus Professor of Infectious Diseases.*  
 Dexter H. Howard, Ph.D., *Associate Professor of Microbiology and Immunology.*  
 David L. McVickar, M.D., Ph.D., *Associate Professor of Microbiology and Immunology.*  
 James N. Miller, Ph.D., *Associate Professor of Microbiology and Immunology.*  
 Jack G. Stevens, D.V.M., Ph.D., *Associate Professor of Microbiology and Immunology.*  
 Henry E. Weimer, Ph.D., *Associate Professor of Microbiology and Immunology.*  
 Felix O. Wettstein, Ph.D., *Associate Professor of Molecular Biology.*  
 Debi P. Nayak, B.V.Sc., Ph.D., *Assistant Professor of Microbiology and Immunology in Residence.*  
 Jerrold A. Turner, M.D., *Assistant Professor of Microbiology and Immunology and Medicine in Residence.*  
 ———, *Assistant Professor of Microbiology and Immunology.*



- Charles W. Buggs, Ph.D., *Visiting Professor of Microbiology and Immunology.*  
 Seymour Froman, Ph.D., *Associate Clinical Professor of Microbiology and Immunology.*  
 Frances A. Hallman, M.S., *Lecturer in Microbiology and Immunology.*  
 Maurice L. White, Ph.D., *Lecturer in Microbiology and Immunology.*

The Department of Medical Microbiology and Immunology in the School of Medicine offers the M.S. and Ph.D. degrees in medical microbiology and immunology. Graduate study may be in the fields of bacteriology, immunochemistry, immunogenetics, microbial genetics, mycology, parasitology, virology, or viral oncology. The graduate program is primarily designed for students seeking advanced training leading to the Ph.D. degree in any one of these special fields, or for students with a broader interest in the biology of infectious agents, immunology and host-parasite relationships who may elect to combine two or more fields. Occasional students may be accepted for the M.S. degree.

#### Admission to Graduate Status

For admission to the graduate program, a student must meet the requirements of the Graduate Division, and must hold an approved bachelor's degree with a major in either the biological or physical sciences. Candidates are selected on the basis of an evaluation of the applicant's potential for graduate work as determined by:

1. Undergraduate, and where applicable, graduate scholastic record.

2. An interview with members of the Department, when possible.

3. Letters of recommendation.

#### Requirements for the Master's Degree

1. The general Graduate Division requirements (pages 153-154).

2. Microbiology and Immunology 201A-201B.

3. General Biochemistry 153 or Biological Chemistry 101A-101B-101C.

4. Comprehensive Examination.

#### Requirements for the Doctor's Degree

1. The general Graduate Division requirements (pages 156-160). (Proficiency in only one foreign language required.)

2. Three "core" courses in biochemistry: Chemistry 153, Chemistry 253, or equivalent, and one course selected from Chemistry 255, Chemistry 263, Chemistry 267, or the equivalent. Preparation for these courses includes mathematics through calculus and general physical chemistry.

3. Microbiology and Immunology 201A-201B, or equivalent.

4. Microbiology and Immunology 599 (Research).

In addition to the formal requirements stated above, every student must pass written examinations within the Department to become eligible to take the oral qualifying examination. The written examinations are divided into 4 parts of 3 hours each and given on two separate days to test the student's general knowledge in the field of medical microbiology and immunology. The student, normally, should take them during the second year of graduate study.

**Graduate Courses**

**201A. Microbiology and Immunology. (1½ courses)**

Lectures and laboratory. Prerequisite: consent of the instructor. Study of the infectious agents of human disease with emphasis on host-parasite relationships and immunologic phenomena in immunity and disease, including identification of bacteria, fungi, animal parasites and viruses, and principles of prevention, treatment, and laboratory diagnosis.

The Staff

**201B. Microbiology and Immunology.**

Continuation of course 201A.

The Staff

**206. Animal Virology.**

Prerequisite: course in general biochemistry and in general microbiology, including virology. Consent of the instructor may be obtained in special cases. A study of viral structure, basic mechanisms of virus cell interaction, biochemistry of virus replication, and oncogenesis of viruses.

Mr. Baluda

**209. Principles of Immunochemistry.**

Prerequisite: Consent of the instructor. An introduction to the study of the chemistry of antigens, antibodies, and complement, and the mechanism of their interaction. The methods involved for their detection, isolation, and measurement with emphasis on the quantitative aspects of the reactions. Immunization and sensitization of experimental animals. The immunoglobulin concept and the immunologic basis of allergy.

Mr. Weimer

**210. Medical Mycology.**

Prerequisite: Bacteriology 100A-100B; recommended Bacteriology 110. Consent of the instructor may be obtained in special cases. A study of the morphology, physiology, and pathogenicity of fungi causing human and animal diseases.

Mr. Howard

**251A-251C. Seminar in Microbiology and Immunology. (¼ course)**

Consideration of the history of infectious diseases, their host-parasite relationships, etiology, pathogenesis, epidemiology, diagnosis, and immunity.

Mr. Zamenhof and the Staff

**252. Seminar in Medical Virology. (¼ course)**

Review of current literature in the field of medical virology emphasizing fundamental host-cell interrela-

tionships in human disease of viral origin. Selected topics will be discussed and results interpreted; conclusions and experimental methods will be evaluated.

Miss Sellers

**253. Seminar in Medical Parasitology. (¼ course)**

Review of current and recent literature in the field of medical parasitology, emphasizing experimental work of medical or public health importance. Students will be expected to prepare reviews of selected subjects, and to discuss the contributions of various workers from the standpoint of experimental methods, results, their interpretation and their evaluation.

Mrs. Voge

**254. Seminar in Immunogenetics. (½ course)**

Review of current and recent literature in the field of immunogenetics, with emphasis on fundamental studies involving genetic and immunologic principles and techniques. Selected topics will be discussed and results interpreted; conclusions and experimental methods will be evaluated.

Mr. Hildemann

**255. Seminar in Medical Mycology. (¼ course)**

Review of current and recent literature in the field of medical mycology, with emphasis on the host-parasite relationships in the human and animal mycoses. Students will be expected to prepare reviews of selected subjects and to discuss contributions of various workers from the standpoint of experimental methods, results, their interpretation and evaluation.

Mr. Howard

**256. Seminar in Viral Oncology. (½ course)**

An advanced research seminar designed to consider the current developments in the field. Selection of current subjects and publications dealing with tumor viruses, oncogenesis, development, and cellular regulation.

Mr. Baluda

**257. Seminar in Host-Parasite Relationships.**

(½ course)

(Same as Microbiology 257.) A discussion of recent advances in our knowledge of host-parasite interactions and means of controlling the parasites.

Mr. Miller, Mr. Pickett

**Individual Study and Research**

**597. Preparation for the Examinations for the M.S. Degree or for the Ph.D.**

(½ to 1½ courses)

The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (½ to 2 courses)**

Prerequisite: Bacteriology and/or Biochemistry. Research on an original problem in the field of Medical Microbiology and Immunology, to be selected by the graduate student with the advice of the instructor. Fields of study may be in bacteriology, immunochemistry, immunogenetics, microbial genetics, mycology, parasitology or virology.

The Staff

■ **METEOROLOGY**

(Department Office, 7127 Mathematical Sciences Building)

Akio Arakawa, D.Sc., *Professor of Meteorology.*

Jorgen Holmboe, M.Sc., *Professor of Meteorology.*

Yale Mintz, Ph.D., *Professor of Meteorology (Chairman of the Department).*

Morris Neiburger, Ph.D., *Professor of Meteorology.*

••Zdenek Sekera, Ph.D., *Professor of Meteorology.*

Morton G. Wurtele, Ph.D., *Professor of Meteorology.*

••Jacob Bjerknes, Ph.D., *Emeritus Professor of Meteorology and Geophysics.*

James G. Edinger, Ph.D., *Associate Professor of Meteorology.*

Hans Pruppacher, Ph.D., *Associate Professor of Meteorology.*

George L. Siscoe, Ph.D., *Associate Professor of Meteorology.*

Sekharipuram V. Venkateswaran, Ph.D., *Associate Professor of Meteorology.*

Michio Yanai, D.Sc., *Associate Professor of Meteorology.*

William D. Bonner, Ph.D., *Assistant Professor of Meteorology.*

Richard M. Thorne, Ph.D., *Assistant Professor of Meteorology.*



Gerald Schubert, Ph.D., *Assistant Professor of Planetary Physics.*

#### **Preparation for the Major**

Course 4A-4B-4C; Physics 7A-7B-7C-7D; Mathematics 11A-11B-11C and 13A-13B-13C.

#### **The Major**

Course 109A-109B-109C, Physics 110A, 110B, 112A, 131A, 131B, or Engineering 192A-192B; four courses from Meteorology 143, 151A-151B, 152, 153, 154, 161. In addition, Students preparing for graduate studies in dynamics and synoptics should take as electives the following three courses: Mathematics 130B, 130C, 132, or 140A; students preparing for graduate studies in atmospheric radiation or upper atmospheric physics should take as electives the following four courses: Physics 113, 115A, 115B, 108, or 122. Students preparing for graduate studies in cloud and precipitation physics should take as electives the following four courses: Physics 112B, 115A, 115B, 140.

#### **Admission to Graduate Status**

The Department recognizes the desirability of a wide variety of backgrounds of students concerned with study of the various aspects of the atmosphere. In addition to those holding bachelor's degrees in meteorology, graduates with degrees in related disciplines—physics, mathematics, geophysics, engineering, chemistry, and geology—are encouraged to apply for graduate status in the Department. Programs are arranged by consultation between the student and the Department's graduate advisers, and considerable flexibility is maintained so that maximum advantage may be taken of the candidate's previous education.

#### **Requirements for the Master's Degree**

A bachelor's degree in one of the following: meteorology, physics, mathematics, as-

tronomy, chemistry, geophysics or engineering.

A study program, approved by the Departmental graduate advisers. This shall include Meteorology 260, and graduate courses in at least three of the following fields of specialization; Dynamic Meteorology, Synoptic Meteorology, Cloud Physics, Atmospheric Radiation, Physics of the Upper Atmosphere and Planetary and Space Physics.

A passing grade on a written comprehensive examination, to be conducted in two parts, one in the candidate's field of specialization and one in related fields. The candidate will choose his related fields with the approval of the graduate advisers.

The Department operates under the "comprehensive examination plan" rather than the "thesis plan." However, arrangements can be made for a student to write a master's thesis provided he has a worthwhile research problem, and provided some professor is willing to undertake the guidance of his work. In this case the student must petition the Department for permission to pursue the "thesis plan." The comprehensive examination requirement will be waived if the petition is approved.

A reading knowledge of a foreign language is not required.

#### **Requirements for the Doctor's Degree**

For the general requirements, see pages 156-160.

A reading knowledge of one foreign language is required and should be taken during the first year of residence. Courses in numerical analysis which will aid the candidate in the use of high-speed computers can be substituted for the reading knowledge of a foreign language.

For consideration as a potential candidate

•• Member of the Institute of Geophysics and Planetary Physics.

for the doctor's degree in meteorology, a student must have completed the course requirements for the master's degree in this department or have an academic record showing an exceptionally strong background in physics and applied mathematics. Students are encouraged to complete the master's degree program before proceeding for the Ph.D. degree.

The program of preparation for the qualifying examination should include advanced graduate courses in mathematics and physics appropriate to the area of specialization in meteorology in which the student plans to do his research, as well as advanced courses in meteorology in his area of specialization. The fields of specialization in the Department are: dynamic meteorology (fundamental hydrodynamics, atmospheric waves, planetary circulations, turbulence and diffusion, numerical weather prediction); synoptic meteorology (application of dynamic theories to the analysis and interpretation of atmospheric structures and motions, from the local to the planetary scale); physics of clouds and precipitation; radiative transfer and atmospheric optics (theory and application of radiative transfer in the study of the Earth and other planetary atmospheres); physics of the upper atmosphere (ionospheric electrodynamics, magnetospheric phenomena, solar influences).

The following examinations are required for advancement to candidacy: (a) A written and an oral departmental qualifying examination in the candidate's field of specialization. In addition, the Department has the option of conducting a one-week open-book written examination. (b) An oral qualifying examination conducted by the candidate's doctoral committee.

After advancement, the candidate must complete satisfactorily the following: (a) A dissertation which represents an original contribution to knowledge in the field of meteorology. (b) A final doctoral examination conducted by the doctoral committee.

**Lower Division Courses**

**3. General Meteorology.**

(Same as Physical Sciences 3M.) Lecture, three hours, laboratory two hours. Introduction to the phenomena and processes which occur in the atmospheric environment. Mr. Edinger, Mr. Neiburger

**4A-4B-4C. Introduction to Meteorology.**

Lecture, three hours; laboratory, six hours. Prerequisite: Mathematics 11A-11B-11C, and Physics 7A-7B. Composition, thermal structure and field of motion of atmosphere; weather systems; clouds and precipitation; radiation and energy budget; upper at-

mospheric phenomena; local circulations and microclimates; meteorological instruments and observations. Mr. Edinger

**Upper Division Courses**

**109A. Dynamics of the Atmosphere I.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 4A, 4B, 4C; Mathematics 13C. Kinematics of fluid motion. Laplacian field. Dynamics of barotropic flow, of shear flow. Rayleigh surface and Helmholtz waves. Instability of stratified shear flow. Buoyancy instability Mr. Siscoe

**109B. Dynamics of the Atmosphere II.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 109A. Dynamics of a rotating atmosphere. Coriolis force. The planetary vorticity gradient. Potential vorticity. Hydrostatic and geostrophic approximations. Elementary linear cyclone theory in a two-layer atmosphere and in models with continuous stratification and shear. Mr. Wurtele

**109C. Dynamics of the Atmosphere III.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 109B. Introduction to the theory of viscous flow. Viscous stress. The Navier-Stokes equations. The Ekman boundary layer. Energy transformations. Dissipation. The first law of thermodynamics. The general forms of the vorticity equation, with applications. Mr. Wurtele

**\*143. Physical Oceanography.**

Lecture, three hours; discussion or field trip, one hour. Prerequisite: courses 4A-4B-4C. Physical structure of the oceans; observational techniques. Theory of waves, currents, swell and tides.

**151A. Structure and Dynamics of Weather Systems I.**

Lecture, three hours. Prerequisite: Meteorology 109C prerequisite or concurrent. The general circulation, planetary waves, extratropical cyclone-waves. Mr. Arakawa

**\*151B. Structure and Dynamics of Weather Systems II.**

Lecture, three hours. Prerequisite: Meteorology 109C prerequisite or concurrent. Intertropical convergence zone, easterly waves, tropical cyclones. Mesoscale and convective systems. Mr. Yanai

**152. Physics of Clouds and Precipitation.**

Lecture, three hours. Laboratory one hour. Prerequisites: Mathematics 13C and Physics 112A or Chemistry 110A. The nature and structure of clouds and precipitation; phase changes of water in the atmosphere; condensation on nuclei; development of precipitation particles. Mr. Neiburger

**\*153. Atmospheric Radiation.**

Lecture, three hours. Elementary theory of thermal radiation of the atmosphere. Mr. Sekera

**154. Physics of the High Atmosphere and Its Plasma Environment.**

Lecture, three hours. Prerequisites: Physics 110A, B; Meteorology 109A,B,C. Solar electromagnetic radiation and solar wind; their interaction with the earth and planets; e.g., geomagnetic phenomena,

\* Not to be given, 1970-1971.

trapped particle and wave radiation, Aurora and airglow, ionospheric morphology, upper atmosphere tidal effects, mesospheric meteorology and aeronomy.

Mr. Siscoe, Mr. Thorne, Mr. Venkateswaran

### 161A-161E. Meteorology Laboratory.

(½ or 1 course)

Laboratory, 6 to 12 hours. Prerequisite: Junior standing and consent of the departmental undergraduate adviser. Maximum of three full courses. Laboratory exercises and experiments in the following areas. The Staff

161A. Techniques of meteorological observations and measurements.

161B. Synoptic map and analysis.

161C. Cloud physics experiments.

161D. Atmospheric radiation experiments.

161E. Ionospheric measurements.

### 199. Special Studies in Meteorology.

(½ or 1 course)

Prerequisite: senior standing and consent of the instructor. Special individual study. The Staff

#### Graduate Courses

### DYNAMIC AND SYNOPTIC METEOROLOGY

#### 204A-204B-204C. Meteorological Hydrodynamics.

Lecture, three hours. Analysis of strain and stress, solution of simple viscous flows; compressible flow; gravity waves with application to mountain waves; theory on shear flow, with application to cyclone theory. Mr. Holmboe

#### \*206A-\*206B. Atmospheric Convection.

Lecture, three hours. Cellular and turbulent convection over a uniform surface, with applications to atmospheric motion; cloud dynamics. Mr. Wurtele

#### 208A-208B. Atmospheric Turbulence and Diffusion.

Lecture, three hours. Kinematics of homogeneous and shear flow turbulence; surface and planetary boundary layers; survey of field and laboratory observations and their interpretation by theory. Turbulent diffusion, with applications to air pollution. Mr. Neiburger, Mr. Wurtele

#### 210A. Theory of Planetary Circulations.

Lecture, three hours. Dynamics of geostrophic motion. Anelastic balance and hydrostatic balance. Gravity-inertia waves and Rossby waves. Geostrophic adjustment. Quasi-geostrophic balance.  $\beta$ -plane approximation, integral constraints. Baroclinic instability. Mr. Arakawa

#### \*210B. Theory of Planetary Circulations.

Lecture, three hours. Prerequisite: course 210A. Forced circulations in a rotating fluid. Hadley regime and Rossby regime. Eddy transports. Vascillation. Effects of topography. Mr. Arakawa

#### 212A. Numerical Methods in Dynamic Meteorology.

Lecture, three hours. Basic computational methods in numerical studies of atmospheric motion. Finite difference methods and truncation error. Initial value problem. Computational instability. Computational modes and boundary conditions. Energy methods. Boundary value problems. Mr. Arakawa

#### \*212B. Numerical Weather Prediction.

Lecture, three hours. Prerequisite: courses 212A, 210A or consent of the instructor. Physical and computational design of numerical weather prediction and climate simulation models. Map projection. Barotropic model. Solution of balance equation. Quasi-geostrophic baroclinic model. Balanced model. Primitive equation and its initial condition. Predictability. Inclusion of topography, heat and friction. Mr. Arakawa

#### \*214A-\*214B. General Circulation of the Atmosphere.

Lecture, three hours. Observations of the general circulation and global climate. Global budgets of energy and angular momentum; global hydrologic cycle. Numerical simulation of the general circulation. Laboratory simulation of the general circulation. Circulation and climate of the Ice Ages. Atmospheric circulation and climate of the Mars. Mr. Mintz

#### 216A-216B. Dynamics of the Tropical Atmosphere.

Lecture, three hours. General circulation in the tropics. Easterly waves. Tropical cyclones. Intertropical convergence zone. Equatorial wave disturbances. Quasi-biannual oscillation. Mr. Yamal

#### \*218A. Structure and Dynamics of Large-Scale Weather Systems.

Lecture, two hours; laboratory, six hours. Prerequisite: course 151B. Multilevel analysis of selected weather systems. Calculation of moisture and energy budgets and determination of vertical motions from models that include diabatic heating.

#### \*218B. Mesoscale Analysis.

Lecture, two hours; laboratory, six hours. Prerequisite: course 151B. Detailed analysis of severe weather situations emphasizing the use of satellite data and radar reports in conjunction with standard observations to trace the history of individual mesosystems.

#### \*220A-\*220B. Dynamics of the Atmosphere-Ocean Systems.

(Formerly numbered 212A-212B.) Lecture, three hours. Mass, momentum and heat transfers between atmosphere and ocean; wind-driven ocean currents; thermohaline convection; dynamics of the Gulf Stream.

### CLOUD AND PRECIPITATION PHYSICS

#### \*221. Atmospheric Chemistry.

Lecture, three hours. Variable and nonvariable gases of the atmosphere; physical and chemical properties of atmospheric aerosols; wet and dry removal mechanisms of variable gases and aerosols. Mr. Pruppacher

#### \*223A. Cloud and Precipitation Physics I.

Lecture, three hours. Microstructure of all-water clouds, all-ice clouds, and mixed water-ice clouds; physical properties of drop-forming and ice crystal-forming nuclei; phenomenology of drop and ice crystal nucleation; phenomenology of drop and ice crystal growth by diffusion and collision. Mr. Pruppacher

\* Not to be given, 1970-1971.

**\*223B. Cloud and Precipitation Physics II.**

Lecture, three hours. Prerequisite: course 223A. Physics of water substance: thermodynamic properties, surface and bulk structure, electrical properties of water vapor, liquid water, and ice; thermodynamic and kinetic theory of phase transition; theory of homogeneous and heterogeneous nucleation of water drops and ice crystals. Mr. Pruppacher

**\*223C. Cloud and Precipitation Physics III.**

Lecture, three hours. Prerequisite: course 223B. Hydrodynamics of rigid bodies in a viscous medium; hydrodynamics of water drops and ice crystals; theory of the growth of water drops and ice crystals by diffusion; theory of the growth of water drops and ice crystals by collision. Mr. Pruppacher

**224A-224B. Atmospheric Electricity.**

Lecture, three hours. Prerequisite: Physics 110A-110B. Fair weather electricity; atmospheric ions; nature of the electric field in the higher atmosphere and in space; electric structure of stormy and non-stormy clouds; electric charge generation mechanisms in clouds; physics of thunder and lightning; sferics; effect of electric charges and fields on clouds. Mr. Pruppacher, Mr. Siscoe

**ATMOSPHERIC RADIATION**

**225A-225B. Radiation Processes in the Atmosphere.**

Lecture, three hours. Scattering of radiation by electrons and atoms. Transmission of molecular bands along homogeneous and atmospheric paths—atmospheric emission—radiative equilibrium—techniques of atmospheric probing.

**225C. Scattering Processes in the Atmosphere.**

Lecture, three hours. Scattering of radiation by atoms, molecules and aerosols.

**226A-226B-226C. Theory of Radiative Transfer in Planetary Atmospheres.**

Lecture, three hours. Radiative transfer in parallel atmospheres, subject to different types of scattering, absorption and emission processes. Mr. Sekera

**\*229. Radiometric Analysis of Planetary Atmospheres.**

Lecture, three hours. Analysis and interpretation of radiation measurements made from satellites and space probes.

**PHYSICS OF THE UPPER ATMOSPHERE**

**240. Atmospheric Wave Phenomena.**

Lecture, three hours. Prerequisite: Physics 110B or equivalent. Characteristics of acoustic electromagnetic and plasma waves, magnetoionic theory, ray tracing techniques, instabilities in the earth's environment. Mr. Thorne

**246. Physics of the Ionosphere.**

Lecture, three hours. Prerequisite: Physics 110A-110B or consent of the instructor. Structure, composition and dynamics of ionospheric layers. Mr. Venkateswaran

**\*247A-247B. Non-Thermal Radiation Processes.**

Lecture, three hours. Prerequisite: Physics 210A or consent of the instructor. Origin and characteristics of non-thermal radiation; solar flare phenomena

and theory, geophysical influences; radio noise from planetary atmospheres; sferics; noise associated with particle precipitation. Interplanetary scintillation; incoherent scattering by plasmas; observational results and techniques.

Mr. Thorne, Mr. Venkateswaran

**\*248. Dynamics of the Magnetosphere.**

(Formerly numbered 248B.) Lecture, three hours. Solar wind-geomagnetic field interaction; formation of the magnetosphere; the bow shock and magnetosheath; the magnetospheric field; magnetospheric convection; the geomagnetic tail; static and dynamic equilibrium of the magnetosphere; geomagnetic storms. Mr. Siscoe

**249A-249B-249C. Plasma Phenomena in the Earth's Environment.**

Lecture, three hours. Elementary plasma physics, such as Physics 122 recommended. Topics selected from the solar wind, the magnetosphere, and the ionosphere. Emphasis on basic plasma processes and the coupling between different regions. Topics covered include physics of the radiation belt, nature of the plasmopause, geomagnetic storms, ionospheric and magnetospheric current systems, particle precipitation, auroral models, aeronomic processes, irregularities. Mr. Siscoe, Mr. Thorne, Mr. Venkateswaran

**250A-250B. Dynamics of the Solar Wind.**

(Same as Planetary and Space Science 250A-250B.) Lecture, three hours. Prerequisite: PSS 202 or consent of the instructor. Topics to include Parker's hydrodynamic solution and spiral magnetic field model, dynamical effects of magnetic field and solar rotation, angular momentum flux, shock waves, discontinuities, small amplitude wave propagation, and nonradial flow components. Mr. Schubert, Mr. Siscoe

**Seminars**

**260. Seminar in Meteorology. (½ course)**

The Staff

**261. Seminar in Atmospheric Dynamics. (½ course)**

Mr. Arakawa, Mr. Mintz, Mr. Yanai

**262. Seminar in Cloud and Precipitation Physics. (½ course)**

Mr. Neiburger

**263. Seminar in Atmospheric Radiation. (½ course)**

Mr. Sekera

**264. Seminar in Physics of the Upper Atmosphere. (½ course)**

Mr. Siscoe, Mr. Thorne, Mr. Venkateswaran

**\*265. Seminar in Weather Analysis and Forecasting. (½ course)**

**Individual Study and Research**

**596. Directed Studies for Graduate Students. (½ to 1 course)**

The Staff

**597. Preparation for the Master's Comprehensive Examinations and the Doctoral Qualifying Examinations. (½ to 1 course)**

The Staff

**598. Research and Preparation of the Master's Thesis. (½ to 1 course)**

The Staff

**599. Research on Doctoral Dissertation. (½ to 1½ courses)**

The Staff

\* Not to be given, 1970-1971.

**Related Courses in Other Departments**

**Astronomy** 101; 103A-103B-103C.  
**Chemistry** 110A-110B; 113; 114A; 123A-123B; 140A-140B.  
**Engineering** 100C; 103A; 117A-117B; 120A; 124A; 125A-125B; 125L; 127A-127B; 131C; 140A; 150A-150B; 181A; 192A-192B-192C.  
**Mathematics** 130A-130B-130C; 131A-131B-131C; 132; 140A-140B-140C; 143; 150A-150B-150C; 152A-152B.  
**Physics** 108; 110A-110B; 112A-112B; 115A-115B; 121; 122; 131A-131B.  
**Planetary and Space Science** 101.

**Graduate Courses of Special Interest to Qualified Meteorology Majors.**

**Astronomy** 201A-201B-201C.  
**Chemistry** 215; 223.  
**Engineering** 218A-218B-218C; 224B; 225A-225B; 231C; 250A-250B-250C; 252A-252B; 259A.  
**Mathematics** 250A-250F; 265A-265B-265C; 266A-266B-266C; 267A-267B; 269A-269B-269C; 271A-271B-271C; 276A-276B-276C.  
**Physics** 210A-210B; 215A-215B; 220B; 222A-222B-222C; 231A-231B-231C.  
**Planetary and Space Science** 202; 210; 214; 218; 223; 240; 260A-260B-260C; 265; 272B-272C.

**■ MICROBIOLOGY****Graduate Study**

The M.A. and Ph.D. degrees in microbiology are offered in the Department of Bacteriology (see page 193). Programs of study and research leading to the M.A. and Ph.D. degrees in the general area of microbiology are also offered in the Department of Botanical Sciences (see page 200), in the Depart-

ment of Medical Microbiology and Immunology, School of Medicine (see page 384), and in the Department of Zoology (see page 539). More detailed information regarding admission requirements and opportunities for graduate studies in these programs may be obtained by writing to the graduate adviser in the department concerned.

**■ MILITARY SCIENCE**

(Department Office, 132 Men's Gymnasium)

Frank E. Burgher, M.A., Colonel, Infantry, *Professor of Military Science (Chairman of the Department)*.

Charles N. Hilger, B.S., Major, Armor, *Associate Professor of Military Science*.

James T. Bushong, B.S., Major, Chemical Corps, *Assistant Professor of Military Science*.

Robert W. Menig, B.A., Captain, Infantry, *Assistant Professor of Military Science*.

Curtis E. Riegel, B.S., Major, Armor, *Assistant Professor of Military Science*.

**College of Letters and Science**

Most department majors have sufficient free electives to allow all courses in this Department to be included in meeting the minimum degree requirements in Letters and Science. Students should check with this Department and with major Department counselors for details on number of courses acceptable toward a baccalaureate degree.

**College of Engineering**

The number of courses in this Department which may be included in meeting the minimum requirements for an engineering degree will be determined on an individual basis. The student should check with this Department and with his engineering counselor for details.

**College of Fine Arts**

At least six courses of this Department are acceptable toward meeting the minimum degree requirements in the College of Fine Arts. Students should check with this Department and with their fine arts counselor for details.

**Army Reserve Officers' Training Corps**

The Army R.O.T.C. program provides education in leadership and management courses leading to a commission in the Army. Students in all academic fields are eligible for admission in the general military science program. Students completing the program may serve in any arm of service of the Army after post-graduate basic training in the appropriate service school. The length of



such service is to be a period of six months or two years, contingent upon the requirements of the service, as prescribed by the Armed Forces Reserve Act of 1955. It is the continuing effort of the Department of the Army to assign graduates to the arm or service most closely aligned with the individual's capabilities, professional training, and preference.

Students are enrolled in the Army Reserve Officers' Training Corps under one of three programs. These programs are:

**Scholarship Program.** High School seniors are selected by nationwide competitive examination. Successful candidates receive tuition, books, uniforms, fees, and \$50 per month from the Department of the Army for a maximum of twelve quarters. Students enrolled under this program must successfully complete the Basic Course in most cases and the Advanced Course in all cases before commissioning. A limited number of two and three year scholarships are available for outstanding students who have successfully completed all or portions of the Basic Course and who intend to enter the Advanced Course. See the Military Science Department for details.

**Four-Year Program.** Students are enrolled in the Basic Course on a voluntary basis. Upon completion of the Basic Course and entrance into the Advanced Course, students are required to execute a contract with the Department of the Army agreeing to complete the Advanced Course, enlist in the United States Army Reserve, and accept a commission if offered. Advanced Course students receive \$50 per month, military science books, and uniforms.

**Two-Year Program.** This program is primarily designed for transfer students from junior colleges and four-year institutions that do not offer Army R.O.T.C. Competition for existing spaces is extremely keen. (UCLA undergraduate students are encouraged to enroll in the four-year program.) Students are enrolled in this program during the Winter Quarter of their sophomore year and must attend a six-week summer camp between their sophomore and junior years. Upon successful completion of this summer camp, the student will enter the Advanced Course under the same requirements as for the four-year program. He will receive \$50 per month, military science books, and uniforms.

The Army R.O.T.C. program is divided into two parts: (1) the two-year Basic Course for all qualified male students who select

Army R.O.T.C., and (2) the Advanced Course for selected students who desire to complete an additional two years of R.O.T.C. training leading to a commission in the United States Army Reserve. Successful completion of the two- or four-year R.O.T.C. branch general curriculum qualifies graduates for a commission in any arm of service. The interests, aptitudes, and educational accomplishments of the student are given careful consideration in order that he may be recommended for a commission in the arm of service for which he is best qualified.

The Universal Military Training and Service Act (65 Stat. 75; 50 U.S.C. App. 451-467) as amended, and as further amended by the Reserve Forces Act of 1955 (PL305, 84th Congress; DA Bul. 12, 1955) defers from the draft students who are enrolled in a military science program and who meet the standards for acceptance and who agree to complete the Advanced Course training upon completion of the Basic Course. The purpose of deferring a student's active military service until completion of the R.O.T.C. course of instruction is to permit him to complete the entire four-year R.O.T.C. program prior to undertaking his active military service obligations. Additional information may be obtained from the Department.

#### Basic Course (Lower Division)

The Basic Course is offered on an elective basis to all qualified undergraduate students. (The two-year Basic Course may be compressed into one year with the approval of the professor of military science.)

The objective of the two-year Basic Course is to acquaint the student with the fundamental principles of national security through the study of the military history of this country, and contemporary military systems to introduce the techniques and principles of modern warfare, and to develop the traits of character and leadership necessary to prepare him to meet his citizenship obligations. These courses prepare the student for the Advanced Course. Draft deferments may be granted to qualified Basic Course students who intend to pursue the four-year R.O.T.C. training program.

All necessary equipment, uniforms, and textbooks are provided free of charge to students.

#### The Advanced Course (Upper Division)

The Advanced Course of instruction is designed to produce junior officers who by their education, training, and inherent quali-

ties are suitable for continued development as officers in any arm or service of the United States Army. Training in military leadership is emphasized. Instruction is given in subjects common to all branches of the Army and qualifies the graduate for the duties of a junior officer. Students in this program, pursuing courses in basic science and engineering, are fully qualified for commissions in the arms or service related to their academic course of study.

Admission to the Advanced Course is by selection from qualified regularly enrolled students who meet the academic and physical requirements and who have demonstrated positive interest and leadership potential. Students may apply if they have successfully completed the Basic Course or have credit for the Basic Course from other institutions authorized to present the equivalent instruction or can present evidence of satisfactory service in the Armed Forces. A student must qualify for appointment as second lieutenant prior to reaching twenty-eight years of age. Normally, students accepted for entrance into the Advanced Course must have at least two more academic years remaining before qualifying for their first baccalaureate degree.

Students, other than scholarship program students, accepted for admission to the Advanced Course are paid approximately \$1000 during the two-year period (exclusive of summer camp). All students have the use of all necessary equipment and textbooks free of charge. The officers uniform provided each student becomes his personal property upon successful completion of the Advanced Course.

Advanced Course students are required to attend a six-week course of training at R.O.T.C. summer camp during the summer vacation period following the completion of the first year of the Advanced Course; this summer camp is attended by Advanced Course R.O.T.C. students from several universities. The training is designed to provide the broad background necessary for a junior officer and stresses practical work in leadership, physical development, and knowledge of the important roles played by all branches of the service in the military team. Supervised social and recreational activities are provided. The student is furnished uniforms, equipment, and receives one-half pay of a second lieutenant and travel expenses to and from camp. Academic credit of four units or one course for the six weeks of camp is not granted by the University.

**Flight Training Program.** Flight Instruction is offered to students in the second year of the Advanced Course. Under this program the Army will pay for flight training for selected qualified R.O.T.C. students. To qualify, the student must have an aptitude for flying and meet required physical standards.

All students are required to attend the scheduled monthly leadership seminars as published in departmental bulletins. Transportation and required equipment will be furnished by the U. S. Army.

#### Freshman Year

In addition to courses offered below the student must complete a two units course ( $\frac{1}{2}$  course) during one quarter in one of the following fields: English composition, effective communications, general psychology, political development and political institutions.

#### 1A. Introduction to the Theory of Warfare I ( $\frac{1}{4}$ Course)

Inquiry into the nature and causes of armed conflicts and war. Course focus is on the elements of national power to include the economic, sociological, political and military factors involved.

CPT. Menig

#### 1B. Introduction to the Theory of Warfare II ( $\frac{1}{4}$ Course)

Study of the instruments of national policy with emphasis on the military institution in conditions of Cold, Limited and General War. Attention will also be directed to the introduction of new weaponry and its effect on the practice of the art of war.

CPT. Menig

#### 1C. The US Defense Establishment ( $\frac{1}{4}$ Course)

A study of the philosophy in establishing and the evolutionary process in developing the US Department of Defense. Includes a study of the Military Departments and the Armed Forces during peace and war.

CPT. Menig

#### Sophomore Year

#### 20A. United States Military History I ( $\frac{1}{4}$ Course)

A study of the evolution of the US Army from colonial times through 1865. Emphasis on the impact of the military on the development of the nation and the growth of military establishment. Includes a study of the principles of war and analysis of campaigns and key military theoreticians and commanders of the period.

MAJ. Riegel

#### 20B. United States Military History II ( $\frac{1}{4}$ Course)

Continuation of MS 20A. A study of the evolution of the US Army from 1865 to the present. Emphasis on modernization and the technological and organizational changes coming about during this era. The impact and importance of civilian control on the military establishment as seen by the professional soldier.

MAJ. Riegel

#### 20C. Contemporary Military Systems ( $\frac{1}{4}$ Course)

Contrasts the US Army to those of NATO, the WARSAW PACT and other major military establishments of the world.

MAJ. Riegel

## Junior Year

In addition to courses offered below, the student must complete a four-unit course in one of the following general fields: history and geography, political science, economics, psychology, sociology and computer sciences.

**103A. Military Teaching Principles (1 Course)**

Introduction to military teaching techniques and principles of adult education. Emphasis is placed on the military as well as the civilian application of these methods. The student is required to prepare and teach a complete original lesson to his fellow students during the course of the class.

MAJ. Hilger

**103B. Fundamentals and Dynamics of the Military Team (1 Course)**

Familiarization with small military unit organization, operations and communications, and introduction to the internal defense developments within emerging nations. Span of control, coordination and decision making factors receive special consideration.

MAJ. Hilger

**103C. Military Management I (1 Course)**

Introduction to a theory of management, organizational behavior, and leadership which will facilitate practical managerial work in either a military or civilian environment. The use of authority and

its relationship to responsibility are discussed through an analysis of role playing and selected case studies.

MAJ. Hilger

## Senior Year

In addition to courses offered below, the student must complete a four unit course in one of the following general fields: history and geography, political science, economics, psychology, sociology and computer sciences.

**104A. Military Management II (1 Course)**

(Prerequisite 103C.) Examination of organizational behavior and group dynamics, staff relationships and theories of management and decision making. This course is structured as a sequel to MS 103C and will continue investigation into the dynamics of small groups, individual and group needs and behaviors.

MAJ. Bushong

**104B. The US Role in World Affairs (1 Course)**

This requirement will be met by enrollment of the student in Political Science 138A, *Defense Strategy and Policies*.

MAJ. Bushong

**104C. Military Legal Systems (1 Course)**

Introduction to the theory and application of military law and legal systems. Course will focus on the Uniform Code of Military Justice and the rights of the accused under the constitution. MAJ. Bushong

## ■ MOLECULAR BIOLOGY

(Institute Office, 5070 Chemistry)

D. E. Atkinson, Ph.D., *Professor of Chemistry.*

Albert A. Barber, Ph.D., *Professor of Zoology.*

Paul D. Boyer, Ph.D., *Director, Professor of Chemistry.*

Isaac M. Harary, Ph.D., *Professor of Biological Chemistry.*

Thomas W. James, Ph.D., *Professor of Zoology.*

George Laties, Ph.D., *Professor of Plant Physiology.*

Wilfried Mommaerts, Ph.D., *Professor of Physiology and Medicine.*

George Popjak, Ph.D., *Professor of Psychiatry and Biological Chemistry.*

W. R. Romig, Ph.D., *Professor of Bacteriology.*

Verne N. Schumaker, Ph.D., *Professor of Molecular Biology in Chemistry.*

Richard Siegel, Ph.D., *Professor of Zoology.*

Fritiof S. Sjostrand, Ph.D., *Professor of Zoology.*

Emil Smith, Ph.D., *Professor of Biological Chemistry.*

Clara Szego, Ph.D., *Professor of Zoology.*

Samuel Wildman, Ph.D., *Professor of Botany.*

Irving Zabin, Ph.D., *Professor of Biological Chemistry.*

Stephen Zamenhof, Ph.D., *Professor of Microbial Genetics and Biological Chemistry.*

John Fessler, Ph.D., *Associate Professor of Molecular Biology in Zoology.*

Alexander N. Glazer, Ph.D., *Associate Professor of Biological Chemistry.*

Richard N. Halpern, M.D., *Associate Professor of Medicine in Residence.*

David R. Krieg, Ph.D., *Associate Professor of Bacteriology.*

Eugene Rosenberg, Ph.D., *Associate Professor of Bacteriology.*

Felix Wettstein, Ph.D., *Associate Professor of Molecular Biology in Medical Microbiology and Immunology.*

Clifford Brunk, Ph.D., *Assistant Professor of Zoology.*

David Eisenberg, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*

F. A. Eiserling, Ph.D., *Assistant Professor of Bacteriology.*  
 Dohn G. Glitz, Ph.D., *Assistant Professor of Biological Chemistry.*  
 Harvey Herschman, Ph.D., *Assistant Professor of Biological Chemistry.*  
 Bruce Howard, Ph.D., *Assistant Professor of Biological Chemistry.*  
 Michael Konrad, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*  
 Donald P. Nierlich, Ph.D., *Assistant Professor of Bacteriology.*  
 Park S. Nobel, Ph.D., *Assistant Professor of Molecular Biology in Botanical Sciences.*  
 Dan S. Ray, Ph.D., *Assistant Professor of Molecular Biology in Zoology.*  
 Winston A. Salser, Ph.D., *Assistant Professor of Molecular Biology in Zoology.*  
 Larry Simpson, Ph.D., *Assistant Professor of Zoology.*  
 Patrice Zamenhof, Ph.D., *Assistant Professor of Biological Chemistry in Residence.*

### **Undergraduate Study**

Undergraduate students with interest in molecular biology are advised to complete an undergraduate major in chemistry, biology, or physics, and to adapt their course programs in consultation with the appropriate undergraduate advisers. In making preparation for graduate study, attention should be given to recommendations given below for preparation for the Ph.D. degree in molecular biology.

An undergraduate major in the molecular biology area at UCLA may be undertaken for students of unusual qualifications and interest in accordance with the regulations governing the major in the College of Letters and Science (see page 71). Interested students may contact the Molecular Biology Institute for additional information.

### **The Ph.D. Program**

A program of study for the Ph.D. degree is supervised by the Interdepartmental Degree Committee for Molecular Biology. The Molecular Biology Institute was established to encourage fundamental research in molecular biology, biophysics, and biochemistry, and to support graduate instruction for qualified students. Members and Associates of the Institute supervise graduate work in a number of areas: molecular genetics, structure-function relationships of biopolymers, biological ultrastructure, energy transduction, and the molecular basis of biological regulation. Applicants for the Ph.D. degree program should have a major in a biological or physical science or mathematics. Course work should include mathematics through calculus, one year each of general and of organic chemistry, a year each of physics and physical chemistry based on use of calculus, and a year of biology. Modification in undergraduate requirements may be made for qualified candidates with interests in certain areas. Candidates may enter the program with some

course deficiencies, but with anticipation these will be made up in the early part of the graduate program.

### **The individual study program**

An individual program of study will be worked out for each student depending upon his particular background and area of specialization. A Student Guidance Committee selected from Molecular Biology Institute Members and Associates will be appointed by the Graduate Advisor for each first-year student. The Committee will meet with the student before the beginning of each quarter and once again at the end of the year. Its functions are to aid in the design of a course program tailored to fit the needs of the student, to help select three laboratories for the student's first year research experience, and to evaluate the student's progress. The supervision of the student's second-year curriculum and research will be transferred from the Guidance Committee to the student's Dissertation Research Supervisor, together with the Graduate Advisor. It is anticipated that by the conclusion of the second year, the student will have completed his course work, his qualifying examinations, and made a start on his dissertation research.

### **Foreign language**

The language requirement is one foreign language which may be French, German or Russian, and which is to be passed before the student is permitted to take his qualifying examination. Foreign students wishing to use English as a foreign language are required to exhibit an excellent mastery of written and oral English.

### **Qualifying examination**

An oral qualifying examination for the doctoral degree usually will be held 1½ to 2 years after entrance to the program. The examination will include preparation of a

written research proposition and its defense. The Examination Committee may also give a written examination at its discretion.

#### Dissertation research

The final period of the student's graduate training is devoted to intensive research in one of a variety of fields:

1. **Molecular Genetics**—Study of the basic principles, structures, and relationships which govern the storage, transmission and expression of genetic information.

2. **Structure-Function Relationships of Biopolymers**—The detailed linear and 3-dimensional structure and chemical properties of nucleic acids, proteins, polysaccharides, and mixed biopolymers in both the isolated state and living organism.

3. **Biological Ultrastructure**—Structure of cells and cellular materials on a molecular or near molecular level as revealed by analytical, microscopic, electron microscopic, x-ray and biological techniques.

4. **Energy Transduction**—Biological utilization of energy from oxidation or light for cellular syntheses; use of chemical change for motility, active transport, and other biological processes.

5. **Molecular Basis of Biological Regulation**—Studies of the basic mechanism of regulation at the level of action of individual catalysts and catalytic systems, and of the regulation of synthesis of biopolymers and essential metabolites.

Other areas of research and study that are being developed include: Biopolymer synthesis, immunochemistry and immunogenetics, membrane structure and function, physical probes of biological ultrastructure, photobiology, differentiation and cell assembly, molecular basis of cancer, and molecular neurobiology.

The program leading to a doctoral degree in molecular biology will usually require four years.

#### Courses related to Molecular Biology

The following courses offered by the departments listed are particularly appropriate to the research areas mentioned above. With the approval of the Guidance Committee or

Research Supervisor, other related courses may be included in a student's program:

**Bacteriology 107.** Comparative Genetics.  
202. Gene Structure and Function.  
203. Chromosome Structure and Replication.

**Biological Chemistry 253.** Proteins and Nucleic Acids.  
255. Biological Catalysis.  
257. Physical Chemistry of Biological Macromolecules.  
263. Cellular Metabolism.  
264. Regulation of Cell Metabolism.  
266. Seminar in Differentiation.  
267. Nucleic Acid and Protein Biosynthesis.

**Botany 211.** Special Topics.

**Chemistry 233A.** Physical Organic Chemistry.  
253. Proteins and Nucleic Acids.  
254. Advanced Biochemical Methods Lab.  
255. Biological Catalysis.  
257. Physical Chemistry of Biological Macromolecules.  
261. Topics in Microbial Genetics.  
261C. Biological Crystallography.  
263. Cellular Metabolism.  
264. Regulation of Cell Metabolism.  
266. Seminar in Differentiation.  
267. Nucleic Acid and Protein Biosynthesis.

**Medical Microbiology and Immunology 208.**  
Animal Virology.

**Microbiology 204.** Microbial Genetics Lab.  
207. Electron Microscopy in Microbiology.  
208. Regulatory Mechanism in Microbial Physiology.  
210. Differentiation in Eucaryotic Microorganisms.

**Zoology 111.** Functional Ultrastructure of Cells.

207. Molecular Biology Lab.  
208. Structural Macromolecules.  
222. Experimental Cell Biology.  
224. Function and Biogenesis of Subcellular Organelles.  
236. Photobiology.  
241A-241B-241C. Electron Microscopy.  
250. Seminar in Current Topics in Molecular Biology.  
277. Seminar on Extra-Nuclear DNA.

## ■ MUSIC

(Department Office, 2449 Schoenberg Hall)

Frank A. D'Accone, Ph.D., *Professor of Music.*

Roy Harris, Hon. Doc., *Professor of Music in Residence.*

Mantle Hood, Ph.D., *Professor of Music and Director of the Institute of Ethnomusicology.*

Boris A. Kremenliev, Ph.D., *Professor of Music*.  
 W. Thomas Marrocco, Ph.D., *Professor of Music*.  
 J. H. Nketia, B.A., *Professor of Music*.  
 H. Jan Popper, Ph.D., *Professor of Music*.  
 Gilbert Reaney, M.A., *Professor of Music*.  
 Walter H. Rubsam, Ph.D., *Professor of Music (Chairman of the Department)*.  
 Clarence E. Sawhill, Mus.D., *Professor of Music*.  
 Abraham A. Schwadron, Mus.A.D., *Professor of Music*.  
 Robert M. Stevenson, Ph.D., *Professor of Music*.  
 Roy E. Travis, M.A., *Professor of Music*.  
 D. K. Wilgus, Ph.D., *Professor of English and Anglo-American Folk Song*.  
 Raymond Moremen, M.S.M., *Emeritus Professor of Music*.  
 Robert U. Nelson, Ph.D., *Emeritus Professor of Music*.  
 Laurence A. Petran, Ph.D., F.A.G.O., *Emeritus Professor of Music and Psychology*.  
 John N. Vincent, Jr., Ph.D., *Emeritus Professor of Music*.  
 Paul E. Des Marais, M.A., *Associate Professor of Music*.  
 Maurice Gerow, Ph.D., *Associate Professor of Music*.  
 Edwin H. Hanley, Ph.D., *Associate Professor of Music*.  
 William R. Hutchinson, Ph.D., *Associate Professor of Music*.  
 Henri Lazarof, M.F.A., *Associate Professor of Music*.  
 David Morton, Ph.D., *Associate Professor of Music*.  
 Robert L. Tusler, Ph.D., *Associate Professor of Music*.  
 Alden Ashforth, M.F.A., *Assistant Professor of Music*.  
 Murray C. Bradshaw, Ph.D., *Assistant Professor of Music*.  
 Paul S. Chihara, A.M.D., *Assistant Professor of Music*.  
 Malcolm Cole, Ph.D., *Assistant Professor of Music*.  
 Marie L. Goellner, Ph.D., *Assistant Professor of Music*.  
 Frederick Hammond, Ph.D., *Assistant Professor of Music*.  
 Richard A. Hudson, Ph.D., *Assistant Professor of Music, and Music Librarian*.  
 James Porter, M.A., *Assistant Professor of Music*.  
 Rodney N. Vlasak, B.A., *Assistant Professor of Music*.  
 ———, *Assistant Professor of Music*.



Ruth Adams, M.A., M.L.S., *Lecturer in Music*.  
 Judith Balsam, *Associate in Music*.  
 Martin Bernheimer, M.A., *Lecturer in Music*.  
 Marjorie Call, B.M., *Lecturer in Music*.  
 Mario Carta, *Associate in Music*.  
 Charles DeLancey, M.A., *Lecturer in Music*.  
 Robert L. DiVall, B.A., *Lecturer in Music*.  
 George Drexler, *Lecturer in Music*.  
 Bert Gassman, *Lecturer in Music*.  
 Alan Gilbert, *Lecturer in Music*.  
 Gary G. Gray, M.M., *Lecturer in Music*.  
 Thomas Harmon, M.A., *Acting Assistant Professor of Music*.  
 Johana Harris, *Lecturer in Music*.  
 Maureen Hooper, Ed.D., *Lecturer in Music*.  
 James L. Jackman, M.A., *Acting Assistant Professor of Music*.  
 Freeman K. James, M.A., *Lecturer in Music*.  
 Bess Karp, M.A., *Lecturer in Music*.  
 Leon Kirchner, B.A., *Visiting Professor of Music*.  
 Leon Knopoff, Ph.D., *Research Musicologist in Ethnomusicology*.

Natalie Limonick, B.A., *Lecturer in Music.*  
 Sinclair R. Lott, B.A., *Lecturer in Music.*  
 Tsun Y. Lui, *Lecturer in Music.*  
 Mitchell Lurie, *Lecturer in Music.*  
 Mehli Mehta, *Senior Lecturer in Music.*  
 Peter Mercurio, M.A., *Lecturer in Music.*  
 Frederick W. Moritz, *Lecturer in Music.*  
 Roy H. Morton, *Lecturer in Music.*  
 Theodore Norman, *Lecturer in Music.*  
 Cesare A. Pascarella, *Lecturer in Music.*  
 Barbara Patton, B.A., *Lecturer in Music.*  
 Stanley Plummer, *Lecturer in Music.*  
 Paul V. Reale, M.A., *Acting Assistant Professor of Music.*  
 Sven H. Reher, M.A., *Lecturer in Music.*  
 Willie Ruff, M.M., *Lecturer in Music.*  
 Manoochehr Sadeghi, *Lecturer in Music.*  
 Lalo Schiffrin, *Lecturer in Music.*  
 Charles Seeger, B.A., *Research Musicologist in Ethnomusicology.*  
 Peggy Ann Sheffield, M.M., *Lecturer in Music.*  
 Hardja Susilo, M.A., *Lecturer in Music.*  
 Paul O. W. Tanner, M.A., *Lecturer in Music.*  
 Suenobu Togi, *Lecturer in Music.*  
 Pauline V. Turrill, M.A., *Lecturer in Music.*  
 Aube Tzerko, B.M., *Lecturer in Music.*  
 Roger Wagner, Mus.D., *Senior Lecturer in Music.*  
 Donn Weiss, M.M., *Lecturer in Music.*  
 Erwin Windward, B.A., *Lecturer in Music.*  
 Waldo M. Winger, M.A., *Lecturer in Music.*  
 Ikuko Yuge, *Lecturer in Music.*  
 ———, *Lecturer in Music.*  
 ———, *Lecturer in Music.*  
 ———, *Lecturer in Music.*  
 ———, *Lecturer in Music.*  
 ———, *Lecturer in Music.*  
 ———, *Lecturer in Music.*

#### Requirements for Entering Music Students

Students planning to complete a major or teaching minor in music whether or not they have taken courses elsewhere, are required to take aptitude and achievement tests prior to enrollment in musicianship and harmony. These examinations, which also include piano sight-reading and performance in the student's medium, are administered during registration week. Students with exceptional ability and achievement may satisfy lower division requirements in musicianship and harmony by examination. Further information may be obtained from the Department of Music.

#### Music Department Honors Program

This program is designed for the senior student majoring in music who has achieved

a 3.25 overall academic average and who has been recommended by the Department. If the student qualifies for this program, he must obtain the permission of the faculty member with whom he wishes to work. The program will allow the qualified student to work on an individual project in his field of specialization during one quarter of his senior year and obtain unit credit equivalent to one course. During this quarter the student need not enroll in any other courses. A public presentation will conclude the project, whether it be a composition, musicological paper, or a recital.

#### Preparation for the Major

Courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Three quarters of either French, German, or Italian, or the equivalent.

Students who plan to specialize in Historical or Systematic Musicology are urged to take six quarters, or the equivalent, of German.

## COLLEGE OF FINE ARTS

### Distribution of Units

The total number of courses in the Music Department which may be included in the 45 courses required for the Bachelor of Arts degree may not exceed 21.

### The Major

A minimum of 15 courses in the upper division, including 100A–100B, 106A, 107A; three courses from 120–147, including one course from 120–122 and one from 123–125; two years of performance organization courses 170, 171 and 172 (only one-half course per quarter in Opera Workshop will count toward this requirement; performance specialists may use two units of 164D for this requirement); and five courses selected from one of the specializations listed below:

1. Composition and Theory: courses 106B, 107B–107C and two elective courses from 101, 103A–103B, 104, 105, 106C, 108, 141–147, 192, and 194.

2. History and Literature: two additional courses, one chosen from 120–122, one from 123–125, and three elective courses. Recommended: courses 120–129, 130–140, 150–151, and 191.

3. Ethnomusicology: 140A–140B–140C and two courses selected from 120–129, 141–147, or 190A–190B.

4. Performance: three courses in applied music classes 160–165, and two elective courses of which no more than one can be in applied music classes or performance organizations. Recommended: 101, 110A–110B, 111A–111B, 171, 172, and additional courses in performance.

5. Music Education: Twenty units toward credential requirements selected from one of the following groups: a. Elementary Teaching Credential. Courses 115A, 115B or 115C, 185, 193, 331 and one elective. Also required are proficiency examinations covering the equivalent of three quarters each in piano and voice. b. Secondary Teaching Credential (Instrumental and General Music). Courses 111A, 114, three from 115A–115B–115C–115D, 116, 185, 193. Also required are proficiency examinations covering the equivalent of two quarters in piano and one quarter in voice. c. Secondary Teaching Credential (Choral and General Music). Courses

110A–110B, 114, 185, 193 and four units of electives. Also required are proficiency examinations covering the equivalent of six quarters each in piano and voice.

Note: Appropriate courses may be taken in preparation for the examinations in voice and piano.

Graduate Year. To fulfill all credential requirements in music, courses not completed in any one specialization must be elected in the fifth year. In addition, the following courses are required: two electives from 182, 184, 270, or 274; and for those specializing in the secondary credential, course 370 taken concurrently with supervised teaching.

6. Systematic Musicology: a. Sociology of Music: Courses 182, 183, and 12 units chosen from 141–147 and the electives listed below. b. Musical Acoustics: Courses 108, 186, and 12 units chosen from the electives listed below: c. Aesthetics of Music: Courses 138, Philosophy 160, and 12 units chosen from the electives listed below: d. Psychology of Music: Course 186, Psychology 188A–188B, and eight units chosen from the electives listed below: e. Electives: Music 108, 137, 138, 150A–150B–150C, 182, 183, 184, 185, 186, Philosophy 160, and Psychology 188A–188B.

7. Opera: three courses from 172A–172E, and two elective courses of which no more than one can be in applied music classes, performance organizations or opera workshop. Recommended: 101, 110A–110B, 111A–111B, 135A–135B–135C, 136, 150A–150B–150C, 151, and 165.

## COLLEGE OF LETTERS AND SCIENCE

### The Major

Twelve courses of upper division work distributed as follows: courses 100A–100B, 106A, 107A; three courses from courses 120–146, including one course from 120–122 and one from 123–125; two years of performance organization courses 170, 171 and 172 (only one-half course per quarter in Opera Workshop will count toward this requirement); and two additional upper division courses in music.

### GRADUATE DIVISION

The Music Department offers programs leading to the degrees of Master of Arts and Doctor of Philosophy in the fields of historical musicology, ethnomusicology, systematic musicology, composition and music education.



### Admission to the Master of Arts program

All applicants must have completed a Bachelor of Arts degree with a major in music (or the equivalent degree) as described in this bulletin on pages 153-154. Transcripts must show an average grade of B in the basic areas that normally constitute the undergraduate core curriculum in music (harmony, counterpoint, the history of music, analysis and musicianship). All applicants are also asked (a) to submit a letter describing the background of study and stating their reasons for wishing to pursue graduate studies in music; (b) to request three former instructors to write letters of recommendation in their behalf (these letters are to be addressed to the Chairman, Music Department, UCLA); (c) to submit written examples of their work: for all branches of musicology and music education a paper on an appropriate subject in the applicant's area; for composition, musical scores. No application can be considered until all of the above materials are received.

### Admission to the Doctor of Philosophy program

The applicant must have completed a Master of Arts degree in music (or the equivalent degree) as described in this bulletin on pages 156-160. The degree normally will have been taken in the same field of concentration as the proposed doctorate. If a student wishes to obtain a doctorate in a field other than that of his M.A., he must complete additional work as prescribed by the Department. All applicants who have received an M.A. from a university other than UCLA are also asked (a) to submit a letter describing their reasons for wishing to pursue graduate studies in music; (b) to request three former instructors to write letters of recommendation on their behalf (these letters are to be addressed to the Chairman, Music Department, UCLA); (c) to submit a copy of their M.A. thesis or composition. No application can be considered until all of the above materials are received.

### First Year Graduate Examinations

All entering students are required to take the first year graduate examinations. These consist of four parts. Three are written examinations (each of approximately three hours length) in harmony and counterpoint, history and literature of music, and analysis of form and style. A fourth part is a performance examination in sight-reading and dictation, score reading and basic piano, and solo performance in the student's principal performing medium. The four examinations will be given at the beginning of every quarter.

Where deficiencies are indicated, the student may take appropriate courses to remedy these deficiencies and take the examinations again. In order to remain in good standing, the student must pass all parts of the examinations within the first calendar year of residence. In no case will remedial course work be counted for credit towards a graduate degree or serve as a substitute for passing any part of the first year graduate examinations.

### Requirements for the Secondary Credential and Elementary Credential

Consult the UCLA Announcement of the Graduate School of Education.

### Requirements for the Master of Arts Degree

*General Requirements.* For general requirements see pages 153-154. Students are required to complete a minimum of nine courses, five of which must be at the graduate level. Upper division courses that may be counted toward the minimum of nine courses include: 103A-103B, 104, 105, 106B-106C, 107B-107C, 108, 109A-109B-109C, 110A-110B, 111A-111B, 112\*, 113\*, 114\*, 116\*, 120, 121, 122, 123, 124, 125, 129, 138, 139, 140A-140B-140C\*\*, 141A-141B, 142, 143A-143B, 145, 146, 147, 160-165, 170-171, 180, 181, 182, 183, 184, 185, 186, Psychology 188A-188B. A maximum of two half-courses in performance may be counted toward the degree. Course 598 serves to guide the preparation of the thesis and should normally be taken during the last quarter of residence.

*Language Requirement.* A reading knowledge of German or French is required in ethnomusicology, systematic musicology and composition; of German, French, Italian, or Spanish in music education, and of German and a choice of French, Italian or Latin in historical musicology. Students lacking these requirements must begin language study during the first year of residence.

### Course of Study

Each student must plan his program under the guidance of the graduate advisor in his field of concentration. Course requirements for each field of concentration are as follows:

1. Historical musicology: 200A, 200B, 210 or 211 (students planning to enter the Ph.D. program are strongly advised to take both 210 and 211 in the first year of residence),

\* May be applied only by students whose emphasis is music education.

\*\* Will not count for students whose emphasis is ethnomusicology.

three terms of 260 and one seminar from 250, 256, 257, 259, 266, or 269; the remaining courses are elective upon the recommendation of the graduate advisor.

2. Systematic musicology: 200A, 200B, 269, three terms of 272, and one term of 273 or 275; the remaining courses are elective upon the recommendation of the graduate advisor.

3. Ethnomusicology: 190A, 190B, 200A, 200B, and one term of 280; the remaining courses are elective upon the recommendation of the graduate advisor.

4. Composition: 200A, three terms of 252 and two terms of 249, 251, or 256; the remaining courses are elective upon recommendation of the graduate advisor.

5. Music Education: a. Thesis Plan: 185, 200A, 200B, 274, and two terms of 270; the remaining courses are elective upon the recommendation of the graduate advisor. b. Comprehensive Examination Plan: 185, 200A, 200B, 274, two terms of 270, and 463; electives from 100-200 series upon recommendation of the graduate advisor. The Comprehensive Examination Plan is designed for students intending to teach, or who are currently teaching at the elementary, secondary, or junior college level. The Comprehensive Examination Plan is not acceptable for future Ph.D. candidates. In addition to the course requirements, the student is expected to pass a comprehensive examination consisting of a three-hour examination in his area of specialization (music in the elementary school, choral or instrumental music in the secondary school, or music in the junior college); a three-hour examination in the general field of music education; and a two-hour examination in either theory, composition, historical musicology, systematic musicology, or ethnomusicology.

### Thesis

In historical musicology, ethnomusicology and systematic musicology the thesis will be an extended essay (see page 155). For students of composition the thesis will be a composition in a large form. Students in music education may elect either the Thesis Plan or the Comprehensive Examination Plan (see program in Music Education above).

### Final Examination

The final examination is oral and includes both discussion of the thesis and related matters. Students in music education electing the Comprehensive Examination Plan will substitute a comprehensive examination (described above) for the final examination.

### Requirements for the Doctor of Philosophy Degree

*General Requirements.* For general requirements see pages 156-160. The status of students in all fields of concentration is provisional subject to departmental approval of the Form I Application (Notice of Intention to Proceed to Candidacy for the Ph.D. degree). Normally this application is filed at the end of the first year of residence. Upon approval of the application, the student may request that a guidance committee be appointed. The guidance committee will assist him in preparing for the written qualifying examinations (see below), which are administered by the same committee. After successful completion of the examinations, a doctoral committee will be appointed. This committee administers the oral qualifying examination and also guides the student in writing his dissertation.

*Language Requirement.* A reading knowledge of French and German is required in systematic musicology, ethnomusicology and music education; of French, German and a third language approved by the Council in historical musicology. Students in the field of composition will elect two languages from German, French, Italian, Russian, or Latin.

### Course of Study

Each student must plan his program under the guidance of the graduate advisor in his field of concentration. Course requirements for each field of concentration are as follows:

1. Historical musicology: 200A, 200B, 210, 211, five terms of 260 and one seminar from 250, 256, 257, 259, 266 or 269. Students who have received the M.A. in historical musicology from UCLA will normally take a minimum of three terms of 260 in the Ph.D. program. Students may complete their residence requirements by electing courses from the 100-200 series listed under the general requirements for the M.A., upon recommendation of their advisor.

2. Systematic musicology: 200A, 200B, 269, five terms of 272 and one term of 273 or 275. Students who have received the M.A. in systematic musicology from UCLA will normally take a minimum of three terms of 272 in the Ph.D. program. Students may complete their residence requirements by electing courses from the 100-200 series listed under the general requirements for the M.A., upon recommendation of their advisor.

3. Ethnomusicology: 190A, 190B, 200A, 200B, and six terms of 280. Students who have received the M.A. in ethnomusicology

from UCLA will normally take a minimum of five terms of 280 in the Ph.D. program. Students may complete their residence requirements by electing courses from the 100-200 series listed under the general requirements for the M.A., upon recommendation of their advisor.

4. Composition: 200A, five terms of 252, and three terms of 249, 251 or 256. Students who have received the M.A. in composition from UCLA will normally take a minimum of three terms of 251 or 252 in the Ph.D. program. Students may complete their residence requirements by electing courses from the 100-200 series listed under the general requirements for the M.A., upon recommendation of their advisor.

5. Music Education: 184, 185, 200A, 200B, 274, and five terms of 270. Students who have received the M.A. in music education from UCLA will normally take a minimum of three terms of 270 in the Ph.D. program. Students may complete their residence requirements by electing courses from the 100-200 series listed under the general requirements for the M.A., upon recommendation of their advisor.

#### Examinations

Before he is admitted to candidacy, the student must pass a series of qualifying examinations; after he has completed his dissertation he must pass a final examination, concerned primarily with the dissertation. The qualifying examinations are both written and oral. In the fields of historical musicology, ethnomusicology and music education the written examinations consist of the following: (a) history of musical styles in Western civilization (three hours); (b) analysis of form and style (three hours); (c) an examination to demonstrate a basic knowledge of music in non-Western cultures (two hours); and (d) a choice of one or more: acoustics of music, aesthetics of music, psychology of music, and organology (two hours).

Further written examinations, totaling six hours are required in two areas: (1) Historical musicology: One area to be selected from Ancient, Medieval, Renaissance, or Baroque music; the other area from Classic, Romantic or 20th-century music. (2) Ethnomusicology: Two areas to be selected from contrasting musical cultures. (3) Music Education: Two areas, one to encompass historical, philosophical and psychological bases, the other to be selected from music education emphasizing elementary, secondary, college-university

levels, or adult education. (4) Systematic musicology: The written qualifying examinations consist of the following: (a) a history of musical styles in Western civilization (three hours); (b) analysis of form and style (three hours); (c) an examination to demonstrate a basic knowledge of music in non-Western cultures two hours); (d) a general examination in systematic musicology (two hours); (e) two areas to be selected from acoustics, psychology of music, aesthetics of music, sociology of music and organology (six hours). (5) Composition: The written qualifying examinations consist of the following: (a) composition of a short homophonic and a short polyphonic piece without access to an instrument (three hours); (b) general history of music (three hours); (c) one or more of the following: acoustics, psychology of music, aesthetics of music, or ethnomusicology (two hours); (d) 20th century music (two hours); (e) analysis of form and style (three hours); and (f) music theory from the medieval period to the present (three hours).

#### Dissertation

In all fields but composition the dissertation will be an extended monograph. In the field of composition, the dissertation will be a composition in an extended form, accompanied by an essay that analyzes the work thoroughly, describes its techniques and style, and shows its relationship to the tradition.

#### Lower Division Courses

##### 1. Fundamentals of Music.

Five hours weekly, including two laboratory hours. Singing, ear training, reading music and harmonization of simple melodies are the basic skills developed in this course. The Staff

##### 2A-2B. Introduction to the Literature of Music.

Five hours weekly, including two laboratory hours. Course 2A or consent of the instructor is prerequisite to 2B. Designed for the general University student. Course 13A-13B is for the major and teaching minor in music. 2A surveys the technical and formal principles of musical literature through the mid-eighteenth century; 2B surveys music literature from the mid-eighteenth century to the present. The Staff

##### 3A-3B-3C. Fundamentals of Voice. (½ course each)

(Formerly numbered 40A.) Four hours weekly. Prerequisite: Music I or consent of the instructor. 3A is prerequisite to 3B; 3B is prerequisite to 3C.

Mrs. Patton, Mr. Windward, Mr. Winger

##### 4. Fundamentals of Piano. (½ course)

(Formerly numbered 40E.) Three hours weekly. May be repeated for credit. Mrs. Turrill

**5. Sight Reading (Choral). (No credit)**

Three hours weekly. Designed as an aid for students who need sight reading techniques for solo and ensemble singing. The Staff

**10A-10B-10C. Musicianship. (½ course each)**

Five hours weekly, including three laboratory hours. Prerequisite: Aptitude, Achievement and Performance examinations. Students must enroll in the corresponding course and section of the 11 series. Ear training, sight singing, dictation, and keyboard harmony are correlated with the corresponding quarter of course 11A-11B-11C. The Staff

**11A-11B-11C. Harmony. (½ course each)**

Two hours weekly. Prerequisite: Aptitude, Achievement and Performance examinations. Students must enroll in the corresponding course and section of the 10 series. The study of harmony in music from Bach through the 20th century. The Staff

**12A-12B. Counterpoint.**

(Formerly numbered 5A-5B.) Four hours weekly. Prerequisites: courses 10A-10B-10C and 11A-11B-11C. Writing and analysis of representative contrapuntal works. First quarter: modal counterpoint; second quarter: tonal counterpoint. The Staff

**13A-13B. Introduction to Musical Styles.**

(½ course each)

(Formerly numbered 20A-20B-20C-20D.) Three hours weekly. Course 13A is prerequisite to 13B. Surveys the principal compositions of Western art tradition with emphasis on listening. Designed for the major and teaching minor in music. The Staff

**60-65. Applied Study of Music Literature:**

**Intermediate. (½ course each)**

Two hours weekly. Prerequisites: consent of the instructor. Students enrolling in the following courses must be able to perform scales in all keys for the instrument or voice and must demonstrate proficiency in a repertoire of smaller forms. May be repeated for credit.

**String Classes. 60A. Violin; 60B. Viola; 60C. Cello; 60D. String Bass; 60E. Harp; 60F. Classical Guitar; 60G. Viola da gamba. (Formerly numbered 41K, 41L, 41M, 41N, 41X respectively.)** The Staff

**Woodwind Classes. 61A. Flute; 61B. Oboe; 61C. Clarinet; 61D. Bassoon; 61E. Saxophone. (Formerly numbered 41P, 41Q, 41R, 41S respectively.)** The Staff

**Brass Classes. 62A. Trumpet; 62B. French Horn; 62C. Trombone (Formerly numbered 41U, 41T, 41V respectively.)** The Staff

**Percussion Classes. 63. Percussion (Formerly numbered 41W.)** The Staff

**Keyboard Classes. 64A. Piano; 64B. Organ; 64C. Harpsichord. (Formerly numbered 41E, 41J, 41Y respectively.)** The Staff

**Voice Classes. 65. Voice. (Formerly numbered 41A.)** The Staff

**70A-70P. Performance Organizations.**

(½ course each)

(Formerly numbered 42D, 42C, 42F, 42E, 42J, 42G, 42A, 42B, 42K, 42H respectively.) Prerequisites: consent of the instructor. May be repeated for credit.

70A. A Cappella Choir; 70B. University Chorus; 70C. Madrigal Singers; 70D. Men's Glee Club; 70E. Women's Choral Society; 70F. Collegium Musicum; 70G. Chamber Music; 70H. Symphony Orchestra; 70J. Symphonic Band; 70K. Marching and Varsity Bands; 70N. Chamber Orchestra; 70P. Contemporary Chamber Ensemble The Staff

**71A-71N. Ethnomusicology Performance**

**Organizations. (½ course each)**

(Formerly numbered 45A, 45B, 45C, 45D, 45E, 45F, 45G, 45H, 45J, 45K, 45L, 45M respectively.) Prerequisite: consent of the instructor. May be repeated for credit.

71A. Music and Dance of Bali; 71B. Music and Dance of the Balkans; 71C. Music of China; 71D. Music and Dance of Ghana; 71E. Music and Dance of Greece; 71F. Music of India; 71G. Music and Dance of Japan; 71H. Music and Dance of Java; 71J. Music and Dance of Mexico; 71K. Music of Persia; 71L. Music of the Philippines; 71M. Music of Thailand; 71N. Music of Korea. The Staff

**72A-72C. Opera Workshop. (½ course each)**

Prerequisite: Consent of the instructor. May be repeated for credit. 72A. Acting and Stage Movement for Opera; 72B. Repertory and Coaching; 72C. Rehearsal and Performance. The Staff

**Upper Division Courses****100A-100B. Studies in Analysis.**

(Formerly numbered 108A-108B.) Five hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B; course 100A is prerequisite to 100B. Analysis of significant works from each of the style periods of Western music with emphasis upon the techniques of composition.

100A: Gregorian Chant through 1750; 100B: Rococo to the Present. The Staff

**101. Keyboard Harmony and Score Reading.**

(Formerly numbered 101 and 102.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Emphasizes the reading of figured bass, sequences, modulations in the harmonic vocabulary of the 18th and 19th centuries. Reading at the piano of multi-staff notation, the various C clefs, and parts for transposing instruments; chamber music and simple orchestral scores. The Staff

**103A-103B. Advanced Harmony.**

Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. The advanced study of harmonic practices. Mr. Travis

**104. Advanced Modal Counterpoint.**

(Formerly numbered 105.) Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Writing in three and more voices, with emphasis on 16th century practices. The Staff

**105. Fugue.**

(Formerly numbered 106.) Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Fugal writing for three and more voices. The Staff

**106A-106B-106C. Orchestration.**

(Formerly numbered 109A-109B.) Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B; course 106A is

prerequisite to 106B; course 106B is prerequisite to 106C.

**106A:** Instrumentation; **106B-106C:** Scoring for Ensembles and Full Orchestra. The Staff

### **107A-107B-107C. Composition.**

Three hours weekly. **107A.** Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B, and 100A-100B which may be taken concurrently. **107B.** Prerequisite: course 107A. Primarily for the student whose specialization is composition. **107C.** Prerequisites: course 107B and consent of the instructor. Primarily for the student whose specialization is composition. Vocal and instrumental composition in the smaller forms; two and three-part song forms, rondo, sonata, etc. The Staff

### **108. Acoustics.**

(Formerly numbered 118.) Four hours weekly. Prerequisite: one year of high school physics, Physical Sciences 1, or the equivalent. A course covering the physical basis of musical sounds, including a discussion of the objective cause of consonance and dissonance, together with a treatment of the generation and the analysis of the tones produced by the various musical instruments and the voice. Illustrated lectures and class discussions. The Staff

### **109A-109B-109C. Composition for Motion Pictures and Television. (½ course each)**

Two hours weekly. Prerequisites: courses 106A-106B and 107A-107B-107C, and consent of the instructor. **109A** is prerequisite to **109B**; **109B** is prerequisite to **109C**. Composition of music for the dramatic and documentary film in cinema and television. Techniques used in recording and editing. Mr. Schifrin

### **110A-110B. Study and Conducting of Choral Literature. (½ course each)**

(Formerly numbered 110 and 179B.) Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B; **110A** is prerequisite to **110B**. The theory and practice of conducting as related to the study of choral works from the Renaissance to the present day. Mr. Gerow, Mr. Weiss

### **111A-111B. Study and Conducting of Instrumental Literature.**

(Formerly numbered 111 and 179A.) Five hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B; **111A** is prerequisite to **111B**. The theory and practice of conducting as related to the study of instrumental works for string and wind ensembles. Mr. Sawhill

### **112. Band Scoring.**

Four hours weekly, including two laboratory hours. Prerequisite: course 106A. Scoring for the modern band and wind ensembles. Mr. James

### **113. Music Literature for Children.**

(Formerly numbered 179C.) Four hours weekly, including one laboratory hour. Prerequisite: any one of the following: course 1, 2A, 13A, or consent of the instructor. Study of folk and art music suitable for children, including vocal and orchestral literature of selected periods and countries. Mr. Gerow, Miss Hooper

### **114A-114B. Music Literature for the Adolescent.**

Five hours weekly, including one laboratory hour. Prerequisites: courses 10A-10B-10C, 11A-11B-

**11C, 12A-12B, 13A-13B, 193.** The study of basic concert repertoire of selected periods and countries suitable for use with the adolescent. Emphasis will be placed upon the development of the skills of analysis and research needed in the preparation of musical materials for the beginning and intermediate young listener. Mr. Gerow, Miss Hooper

### **115A-115D. Study of Instrumental Techniques. (½ course each)**

Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. The study of instruments and the techniques used in the development of tone, intonation, fingering, relationships and transposition. Mr. Sawhill, Mr. Tanner

### **116. Study of Instrumental Ensembles. (½ course)**

Four hours weekly. Prerequisite: courses 115A-115B-115C-115D, 193. Students will be assigned to small string and/or wind ensembles as soon as they become proficient in their playing. Written arrangements for small ensembles in various combinations will be performed in class. Mr. James

### **119A-119B-119C. Advanced Study and Conducting of Choral Literature. (½ course each)**

Three hours weekly. Prerequisites: courses 110A-110B. **119A** is prerequisite to **119B**; **119B** is prerequisite to **119C**. Advanced theory and practice of conducting; the study of representative choral works from the conductor's viewpoint. Mr. Wagner

### **120. Music in the Middle Ages.**

(Formerly numbered 123.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. A detailed study of the musical forms and an introduction to sacred and secular music from early Christian times to the end of the 14th century. The Staff

### **121. Music in the Renaissance Period.**

(Formerly numbered 124.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. The meaning of the Renaissance as it applies to music. A study of musical forms, techniques, and aesthetic attitudes from the pre-Renaissance through the age of Palestrina. The Staff

### **122. Music in the Baroque Period.**

(Formerly numbered 125.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. A study of representative works from Monteverdi through Handel and J. S. Bach. The Staff

### **123. Music in the Classic Period.**

(Formerly numbered 126.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. A study of representative works from Domenico Scarlatti through Haydn, Mozart, and Beethoven. The Staff

### **124. Music of the Romantic Period.**

(Formerly numbered 127.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. The growth of Romanticism in the works of Weber and Schubert; the expansion of the style and its culmination in Brahms, Wagner, and Mahler. The Staff

**125. Music of the Twentieth Century.**

(Formerly numbered 128.) Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Form, style, and idiom in music from 1900 to the present. The Staff

**129. Byzantine Music.**

Three hours weekly. Prerequisites: course 2A, or course 13A, or consent of the instructor. An introduction to the structure of Byzantine liturgies, offices, and their chants before 1453. The Staff

**130. Music of the United States.**

(Formerly numbered 121A.) Four hours weekly. Prerequisite: course 2A, or 13A or consent of the instructor. A survey of art music from colonial times to the present. Mr. Marrocco

**131. Music of Latin America.**

(Formerly numbered 121B.) Four hours weekly. Prerequisite: consent of the instructor. A survey of art music from the earliest times to the present. Mr. Stevenson

**132A-132B. Development of Jazz.**

(Formerly numbered 153.) Four hours weekly, including one laboratory hour. Prerequisite: course 2A or 13A or consent of the instructor. Course 132A is prerequisite to 132B. An introduction to jazz; its historical background and its development in the United States. Mr. Tanner

**133. Bach.**

(Formerly numbered 150.) Four hours weekly, including two laboratory hours. Prerequisite: course 2A or 13A or consent of the instructor. The life and works of Johann Sebastian Bach. The Staff

**134. Beethoven.**

(Formerly numbered 151.) Four hours weekly, including two laboratory hours. Prerequisite: course 2A or 13A or consent of the instructor. The life and works of Ludwig van Beethoven. The Staff

**135A-135B-135C. History of the Opera.**

(Formerly numbered 152.) Five hours weekly, including one laboratory hour. Prerequisite: course 2A or 13A or consent of the instructor. 135A: Opera of the Baroque and Classical Periods; 135B: Opera of the Romantic Period; 135C: Opera of the Twentieth Century. Mrs. Limonick, Mr. Popper

**136. Music for the Legitimate Drama and Dramatic Motion Picture.**

(Formerly numbered 137.) Four hours weekly. Prerequisite: consent of the instructor. A history and analysis of incidental music for the theater from ancient Greece to the present. The place and function of background or mood music, overtures, entr'actes, and music that relates to the action or locale. Mr. Rubsamen

**137. Political Influence on Music.**

(Formerly numbered 138.) Four hours weekly. Prerequisite: consent of the instructor. The influence of revolution and dictatorship upon music and its allied arts from antiquity to the present. Mr. Rubsamen

**138. Aesthetics of Music.**

(Formerly numbered 139.) Three hours weekly. Prerequisite: course 2A or 13A or consent of the instructor. A survey of the literature of music aesthetics from Plato to the present. Mr. Marrocco

**139. History and Literature of Church Music.**

(Formerly numbered 171.) Four hours weekly. Prerequisite: course 2A or 13A or consent of the instructor. A study of the forms and liturgies of western church music. The Staff

**140A-140B-140C. Musical Cultures of the World.**

(Formerly numbered 136A-136B.) Five hours weekly. Prerequisite: consent of the instructor. Course 140A is not prerequisite to 140B, 140B is not prerequisite to 140C. A survey of the musical cultures of the world (excluding western art music), the role of music in society and its relationship to other arts; consideration will also be given to scale structure, instruments, musical forms and performance standards. The Staff

**141A-141B. Music of Indonesia.**

(Formerly numbered 122.) Five hours weekly, including two laboratory hours. Prerequisite: course 140A-140B-140C, or consent of the instructor. Study of the diverse musical cultures of Indonesia, with emphasis on the music, dance, theater, literature and historical background of Java and Bali, including a laboratory in gamelan performance. The emphasis in 141A will be on Java; in 141B, on Bali. Mr. Hood

**142. Music of the Balkans.**

(Formerly numbered 129.) Five hours weekly, including two laboratory hours. Prerequisite: course 140A-140B-140C, or consent of the instructor. A survey of the music of the Balkan countries, including a study of eastern and western elements; performance on representative instruments. Mr. Kremenliev

**143A-143B. Music of Africa.**

(Formerly numbered 176A-176B.) Five hours weekly, including two laboratory hours. Prerequisite: course 140A-140B-140C, or consent of the instructor. Course 143A is prerequisite to 143B. An investigation of the historical aspects, social functions and relationships of music to other art forms in selected areas of Africa. Mr. Nketia, Mr. Vlasak

**144. American Folk and Popular Music.**

(Formerly numbered 120 and same as Folklore 144.) Four hours weekly, including one laboratory hour. Prerequisite: course 2A or 13A or consent of the instructor. A survey of the history and characteristics of the music developed in or for general American culture and various subcultures. Mr. Wilgus

**145. History and Theory of Persian Music.**

Five hours weekly. Prerequisites: courses 140A-140B-140C, or consent of the instructor. A detailed analytical study of the history, the theory and the aesthetics of Persian classical music, covering both instrumental and vocal tradition. Mr. Sadeghi

**146. Music of Thailand.**

Five hours weekly, including one laboratory hour. Prerequisites: courses 140A-140B-140C, or consent of the instructor; concurrent participation in Music of Thailand study group. Study of the traditional music of Thailand, with emphasis on the historical background, evolution of the music, instruments and ensembles, forms and styles, theatrical and dance music; the music in its social context. Mr. Morton

**147. Music of China.**

Five hours weekly. Prerequisites: courses 140A-140B-140C or consent of the instructor. A detailed study of the history and evolution of Chinese music with analysis of representative compositions. Mr. Lui

**150A-150B-150C. Music Criticism. (½ course each)**

Two hours weekly. Prerequisites: courses 2A, 13A, or consent of the instructor. A study of factors in critical evaluation of musical works in performance. Mr. Bernheimer

**151. History of Musical Performance Practices. (½ course)**

Two hours weekly. Prerequisites: courses 2A, 13A, or consent of the instructor. A study of musical interpretation and re-creation from the viewpoint of stylistic authenticity. The Staff

**154A-154B. The Afro-American Musical Heritage.**

(Same as Folklore 154A-154B.) Four hours weekly. Prerequisite: consent of the instructor. 154A is prerequisite to 154B. A study of Afro-American rhythm, dance music, field hollers, work songs, spirituals, blues, and jazz; the contrast between West African, Afro-American and Afro-Brazilian musical traditions. Mr. Ruff

**156. Introduction to Electronic Music.**

Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B or consent of the instructor. Introduction to the theory and techniques of electronic music including practical experience in manipulation of the equipment in the studio. Mr. Strang

**160-165. Applied Study of Music Literature:****Advanced. (½ course each)**

Two hours weekly. Prerequisite: one year of intermediate instruction or its equivalent, and consent of the instructor. May be repeated for credit.

**String Classes:** 160A. Violin; 160B. Viola; 160C. Cello; 160D. String Bass; 160E. Harp; 160F. Classical Guitar; 160G. Viola da gamba; 160H. Master Class in Violin; 160J. Harp Ensemble. (Formerly numbered 141K, 141L, 141M, 141N, 141X respectively.) The Staff

**Woodwind Classes:** 161A. Flute; 161B. Oboe; 161C. Clarinet; 161D. Bassoon; 161E. Saxophone. (Formerly numbered 141P, 141Q, 141R, 141S respectively.) The Staff

**Brass Classes:** 162A. Trumpet; 162B. French Horn; 162C. Trombone. (Formerly numbered 141U, 141T, 141V respectively.) The Staff

**Percussion Classes:** 163. Percussion. (Formerly numbered 141W.) The Staff

**Keyboard Classes:** 164A. Piano; 164B. Organ; 164C. Harpsichord; 164D. Accompanying; 164E. Performance Practices in Piano—enrollment only by consent of the instructor. Designed for the most advanced students. (Formerly numbered 141E, 141J, 141Y, 143, 144 respectively.) The Staff

**Voice Classes:** 165. Voice. (Formerly numbered 141A.) The Staff

**170A-170P. Performance Organizations. (½ course each)**

(Formerly numbered 142D, 142C, 142F, 142E, 142E, 142J, 142G, 142A, 142B, 142K, 142H, 142B respectively.) Prerequisite: consent of the instructor. May be repeated for credit.

170A. A Cappella Choir; 170B. University Chorus; 170C. Madrigal Singers; 170D. Men's Glee Club;

170E. Women's Choral Society; 170F. Collegium Musicum; 170G. Chamber Music; 170H. Symphony Orchestra; 170J. Symphonic Band; 170K. Marching and Varsity Bands; 170M. Symphonic Wind Ensemble; 170N. Chamber Orchestra; 170P. Contemporary Chamber Ensemble. The Staff

**171A-171N. Ethnomusicology Performance Organizations. (½ course each)**

(Formerly numbered 145A, 145B, 145C, 145D, 145E, 145F, 145G, 145H, 145J, 145K, 145L, 145M respectively.) Prerequisite: consent of the instructor. May be repeated for credit.

171A. Music and Dance of Bali; 171B. Music and Dance of the Balkans; 171C. Music of China; 171D. Music and Dance of Ghana; 171E. Music and Dance of Greece; 171F. Music of India; 171G. Music and Dance of Japan; 171H. Music and Dance of Java; 171J. Music and Dance of Mexico; 171K. Music of Persia; 171L. Music of the Philippines; 171M. Music of Thailand; 171N. Music of Korea. The Staff

**172A-172E. Opera Workshop. (½ course each)**

Prerequisites: Consent of the instructor. May be repeated for credit. No more than ½ course per quarter in Opera Workshop will apply toward the departmental performance organization requirement for music majors. Each course in 172A-172E may not count more than twice toward this requirement. 172A. Acting and Stage Movement for Opera; 172B. Repertory and Coaching; 172C. Rehearsal and Performance; 172D. English and German Diction for Opera; 172E. French and Italian Diction for Opera. The Staff

**180. Transcription, Analysis, and Classification of Folk Music.**

(Same as Folklore 180.) Five hours weekly. Prerequisites: course 140 or 144. An intensive study of methods and techniques necessary to the study of folk music. The Staff

**181. Folk Music of Central and Western Europe.**

(Same as Folklore 181.) Prerequisite: course 2A or 13A or consent of the instructor. An illustrated examination of the musical styles indigenous to the area between Ireland and Czechoslovakia. Particular attention will be paid to the psychological function of folk music in its social and political context. Mr. Porter

**182. Sociology of Music.**

Four hours weekly. Prerequisite: consent of the instructor. The application of ideas from the social sciences to musical behavior, including socialization, social structure, culture structure, and interaction. Mr. Vlasak

**183. Ethnography of Blues.**

Four hours weekly. Prerequisite: consent of the instructor. The use of ethnographic methods for constructing a picture or model of a culture, viewing blues as a culture area, and including the analysis of blues forms and study of representative examples. Mr. Vlasak

**184. Music in Culture and Education.**

Four hours weekly. Prerequisite: consent of the instructor. The relevance of music to cultural values and the social order; music as communication, symbol and myth. Mr. Vlasak

!Does not fulfill the performance organization requirement for music majors unless 170J is taken concurrently.

**185. Historical and Philosophical Foundations of Music Education.**

Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B, and 193. The development of music education in the United States according to established schools of thought. Mr. Schwadron

**186. Music and Social Psychology.**

Four hours weekly. Prerequisite: Ability to read and write music and consent of the instructor. The study of music and ideas about music as products of psychological processes: affective, cognitive, developmental and social, including the manipulation of these processes by musicians in the invention and performance of music. Mr. Vlasak

**Proseminars****190A-190B. Proseminar in Ethnomusicology.**

(Formerly numbered 197.) Three hours weekly. Prerequisites: courses 140A-140B-140C; may be taken concurrently. The Staff

**191. Proseminar in Historical Musicology.**

Three hours weekly. Prerequisite: two courses from 120, 121, 122, 123, 124, 125. The Staff

**192. Proseminar in Composition.**

Three hours weekly. Prerequisite: course 107C. The Staff

**193. Proseminar in Music Education.**

Three hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. Mr. Gerow, Miss Hooper

**194. Proseminar in Orchestration.**

Three hours weekly. Prerequisite: course 106A-106B-106C. The Staff

**198A-198Z. Special Courses in Music.**

(½ or 1 course)

Four hours weekly. Prerequisites: courses 10A-10B-10C, 11A-11B-11C, 12A-12B, 13A-13B. The Staff

**199. Special Studies in Music.**

Individual studies and Music Department Honors Program. May be repeated to a maximum of eight units. The Staff

**Graduate Courses**

Not open to undergraduate students. See College of Fine Arts, Unit Requirements, page 90.

**200A. Research Methods and Bibliography.**

Three hours weekly. A survey of general bibliographic material in music. The Staff

**200B. Research Methods and Bibliography.**

Three hours weekly. Prerequisite: course 200A. Guided writing, utilizing specific bibliography in historical musicology, systematic musicology, ethnomusicology, and music education. The Staff

**210. Medieval Notation.**

(Formerly numbered 210A.) Three hours weekly. Prerequisite: course 120. Vocal and instrumental notation; paleography of the period. Mr. Reaney

**211. Renaissance Notation.**

(Formerly numbered 210B.) Three hours weekly. Prerequisite: course 121. Vocal and instrumental notation; paleography of the period. Mr. Rubsamen

**249. Seminar in Theory.**

Three hours weekly. Prerequisite: course 107C. The Staff

**250. Seminar in the History of Music Theory.**

Three hours weekly. Prerequisite: courses 200A and 210 or 211. The Staff

**251. Seminar in Orchestration.**

(Formerly numbered 251A-251B.) Three hours weekly. Prerequisites: courses 106B and 107C. May be repeated for credit. The Staff

**252. Seminar in Composition.**

(Formerly numbered 252A-252B.) Three hours weekly. Prerequisites: courses 106B and 107C. May be repeated for credit. The Staff

**253. Seminar in Notation and Transcription in Ethnomusicology.**

Three hours weekly. Prerequisites: courses 140A-140B-140C, 190A-190B or consent of the instructor. The Staff

**254. Seminar in Field and Laboratory Methods in Ethnomusicology.**

Three hours weekly. Prerequisites: courses 140A-140B-140C, 190A-190B or consent of the instructor. Mr. Hood

**255. Seminar in Musical Instruments of the Non-Western World.**

Three hours weekly. Prerequisites: courses 140A-140B-140C, 190A-190B or consent of the instructor. The Staff

**256. Seminar in Musical Form.**

Three hours weekly. Prerequisites: course 100A-100B. The Staff

**257. Seminar in Music of the United States and Canada.**

(Formerly numbered 257A.) Three hours weekly. Prerequisite: course 130. Mr. Marrocco

**258. Seminar in Anglo-American Folk Music.**

(Same as Folklore 258.) Three hours weekly. Prerequisite: course 144. Mr. Wilgas

**259. Seminar in Music of Latin America.**

(Formerly numbered 257B.) Three hours weekly. Prerequisite: course 131. Mr. Stevenson

**260. Seminar in Historical Musicology.**

(Formerly numbered 260A-260B.) Three hours weekly. Prerequisites: courses 200A and 200B; 210 or 211. Students may enroll in 200B, 210 or 211 concurrently. May be repeated for credit. Mr. Hanley, Mr. Rubsamen

**266. Seminar in Music of the Twentieth Century.**

Three hours weekly. Prerequisite: course 125. The Staff

**269. Seminar in the History of European Instruments.**

Three hours weekly. The Staff



**270. Seminar in Music Education.**

(Formerly numbered 270A-270B.) Three hours weekly. Prerequisite: course 193. May be repeated for credit. Mr. Gerow, Mr. Schwadron

**272. Seminar in Systematic Musicology.**

(Formerly numbered 272A-272B.) Three hours weekly. Prerequisite: course 108, Psychology 188A-188B, or consent of the instructor. May be repeated for credit. Mr. Hutchinson, Mr. Vlasak

**273. Seminar in Acoustics of Music.**

Prerequisite: course 108 or consent of the instructor. Mr. Knopoff

**274. Seminar in the Philosophy of Music Education.**

Three hours weekly. Mr. Schwadron

**275. Seminar in Aesthetics of Music.**

Three hours weekly. Prerequisite: course 138. Mr. Marrocco

**280. Seminar in Ethnomusicology.**

(Formerly numbered 280A-280B.) Three hours weekly. Prerequisite: courses 190A-190B and 200A-200B. May be repeated for credit. Mr. Hood

**Professional Courses****330. Music in the Elementary School.**

Five hours weekly, including one laboratory hour. A professional course to equip the student to teach many phases of music in the modern school. Emphasis is placed upon the study of musical literature and interpretive activities. Recommended for candidates for the elementary credential. Miss Hooper

**370. Music in General Education. (½ course)**

Two hours weekly. Prerequisite: courses 110 or 111, 114, 193. Must be taken concurrently with two quarters of supervised teaching. May be repeated for credit up to six units. A study of music instructional materials and learning experiences for the student in general education at the secondary level. Miss Hooper

**463. Administration and Supervision of Music Education.**

Three hours weekly. Considers basic principles and procedures applicable to supervision of instruction, in-service education of teachers who teach music, and problems of administration in music education. Mr. Gerow

**Individual Study and Research**

**596A. Directed Individual Studies in Orchestration and Composition. (½ or 1 course)** The Staff

**596B. Directed Individual Studies in Musicology. (½ or 1 course)** The Staff

**596C. Directed Individual Studies in Music Education. (½ or 1 course)** The Staff

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ or 1 course)** The Staff

**598. Guidance of Master's Thesis. (1 to 2 courses)**

One full course may be applied to course requirements for M.A. The Staff

**599. Guidance of Doctoral Dissertation. (1 or 2 courses)**

The Staff

**Related Courses in Other Departments**

**Dance 154. Music as Dance Accompaniment. 206. Music for Dance.**

**Folklore 106. Anglo-American Folk Song. 243. The Ballad.**

**Integrated Arts 1A-1B-1C. Integrated Arts. Psychology 188A-188B. Psychology of Music.**

**■ NAVAL SCIENCE**

(Department Office, 123 Men's Gymnasium)

Stephen G. Warren, B.S., Colonel, U. S. Marine Corps, *Professor of Naval Science (Chairman of the Department).*

Harry M. Carter, Jr., B.B.A., Lieutenant, U. S. Naval Reserve, *Assistant Professor of Naval Science.*

Gary C. Chapman, B.S., Lieutenant, U. S. Navy, *Assistant Professor of Naval Science.*

Gordon S. Jones, M.S., Lieutenant-Commander, U. S. Navy, *Assistant Professor of Naval Science.*

George H. Ng, B.S., Lieutenant, U.S. Navy, *Assistant Professor of Naval Science.*

Barry P. Rust, B.S., Major, U. S. Marine Corps, *Assistant Professor of Naval Science.*

*Application of Naval Science Courses Toward the Departmental Major Requirements.* Naval science courses may be taken as free elective courses and applied toward the total departmental course requirements. Contact the Naval R.O.T.C. unit and the cognizant college or department to determine the num-

ber of free elective courses for which naval science courses may be substituted.

**Naval Reserve Officers' Training Corps**

By action of the Secretary of the Navy and of the Regents of the University of California in June, 1938, provision was made

for the establishment of a unit of the Naval Reserve Officers' Training Corps on the Los Angeles campus.

The primary objective of the Naval Reserve Officers' Training Corps is to provide at civil institutions systematic instruction and training which will qualify selected students of such institutions for appointment as officers in the regular Navy, Naval Reserve, Marine Corps, and Marine Corps Reserve.

Courses in naval science are given for those who intend to complete the four years of training for a commission in the Navy or Marine Corps. In addition to the courses in naval science described herein, Naval R.O.T.C. students are required to participate each week in a one hour drill period and a one hour discussion section associated with the naval science course.

Initial program enrollment is restricted to able-bodied male students who are citizens of the United States between the ages of seventeen and twenty-one years. Students must pass a physical examination prior to acceptance in this program.

All courses listed are the courses prescribed by the Navy Department for the Naval R.O.T.C. In addition Regular and Contract students must complete, in suitable combinations approved by the Professor of Naval Science, a three quarter sequence in mathematics (calculus); a three quarter sequence in physics or chemistry or physical sciences; a course in American Military Affairs (History) and National Security Policy (Political Science); and a course in computer science. The United States Government furnishes on loan to the individual equipment, uniforms, and naval science textbooks for the use of these students. Upon satisfactory completion of the course, the uniform becomes the property of the student who was enrolled in the regular or contract status.

Regular and Contract students may apply for duty to allow graduate work in selected disciplines.

*Types of N.R.O.T.C. Students.* The Department of the Navy recognizes two N.R.O.T.C. student categories:

1. Regular N.R.O.T.C. students are appointed midshipmen, U.S.N.R., and receive subsistence allowance at the rate of \$50 per month for a maximum period of four years while under instruction at the N.R.O.T.C. institution. Their tuition, fees, books, and laboratory expenses are paid by the U.S. Government during the above period. These

midshipmen are required to take three summer cruises and to remain a member of a regular or reserve component of the U.S. Naval Service until the sixth anniversary of receipt of original commission in that service, four years of which will be on active duty after commissioning as Ensign, U.S. Navy or Second Lieutenant, U.S. Marine Corps. Midshipmen enrolled in this status are selected by nation-wide competitive examination and selection commencing in early November of the year preceding the students' entrance into the University in the fall.

2. Contract N.R.O.T.C. students have the status of civilians who have entered into a mutual contract with the Navy during their first two years. During their junior and senior years they are enlisted in the U.S. Naval Reserve and are entitled to subsistence allowance at the rate of \$50 per month. Contract N.R.O.T.C. students agree to accept a commission in the Naval Reserve or the Marine Corps Reserve, to remain a member of a reserve component of the U.S. Naval Service until the sixth anniversary of receipt of original commission and to serve not less than three years of active duty when ordered. Contract students participate in one summer training cruise.

Regular and contract students are deferred from induction until after completion or termination of their courses of instruction and so long as they continue in a regular or reserve status upon being commissioned. Credit may be allowed for work completed during training cruises and summer camps at the rate of  $\frac{1}{2}$  unit per two weeks duty performed, not to exceed a total of six units.

3. Naval Science students are civilians who, with the approval of the academic authorities and the Professor of Naval Science, may be permitted to pursue Naval Science courses for college credit. They are neither eligible to take N.R.O.T.C. training cruises nor to be paid any compensation or benefits. When vacancies occur in the N.R.O.T.C. Unit quota, naval science students are encouraged to apply for enrollment.

#### Freshman Year

### 1A. Naval Organization. ( $\frac{1}{2}$ course)

An introduction to the structure of the Department of the Navy and its legal framework. Relationships in the Department of Defense. Components of the naval service. Naval organization and practices are examined within the context of American social and industrial organization and practice. Shipboard organization.

LCDR Jones

**1B. Naval Management.**

An introduction to the principles of naval management and leadership practices dictated by the requirements of sea power. Command and control, service and support, logistics management functions and systems. Communications. LCDR Jones

**1C. Naval Ships Systems.**

A familiarization with naval ship design structure, type and purpose. Propulsion systems and basic thermodynamics. Auxiliary power systems, electrical and interior communications. Damage control and ship stability characteristics. LCDR Jones

Sophomore Year

**2A. Seminar: Seapower and Maritime Affairs.**

(½ course)

The seminar is designed to develop the concept of seapower in relation to national power and its application to international relations. The course discusses the precepts of seapower as postulated by Mahan and examines them in light of current world events. LT Chapman

**2B. Seminar: Seapower and Maritime Affairs.**

(½ course)

Prerequisite: course 2A. The seminar continues to develop the concepts presented in course NS 2A and examines them in relation to World War II and the Sea War in Korea. LT Chapman

**2C. Seminar: Seapower and Maritime Affairs.**

(½ course)

Prerequisite: course 2A and 2B. The seminar continues development of principles presented in 2A and 2B. Also examined are current problems involving seapower (e.g. Vietnam, the decline of U.S. merchant marine, the U.S.S.R. presence in the Mediterranean, etc.) LT Chapman

Junior Year

**101A. Dead Reckoning Navigation.**

A study of piloting, coastal navigation, navigational aids and rules of the road. Elements of weather applied in an operational reference. LT Carter

**101B. Celestial Navigation.**

Prerequisite: course 101A. A study of the theory, principles and procedures employed in the determination of position at sea through the use of celestial points of reference. Course includes spherical trigonometry, mathematical analysis, sights, sextants, publications and report logs. LT Carter

**101C. Naval Operations. (½ course)**

Prerequisite: course 101A and consent of the instructor. An introduction to tactical formations and dispositions, ship maneuvers, relative motion, maneuvering board. Tactical plots are analyzed for force effectiveness and unity. LT Carter

**103A. Military Operations I.**

Provides history, missions, and organization of the Marine Corps. Examines the evolution of the art of land warfare with emphasis on the principles of offensive and defensive combat employing historical examples. MAJ Rust

**103B. Military Operations II.**

Further development of the principles of offensive and defensive combat employing historical examples from the Civil War through World War II. MAJ Rust

**†103C. Basic Strategy and Tactics. (½ course)**

Further development of the principles of offensive and defensive combat with emphasis on Marine Corps small unit tactics. An introduction to basic strategy and tactics with an examination of the strategic philosophies of other nations. MAJ Rust

Senior Year

**102A. Naval Engineering.**

A study of naval machinery and auxiliary equipment with emphasis on the basic steam cycle. Concepts of heat transfer, flow of fluids, gas turbine cycle, distillation and refrigeration are included. An introduction is made to principles and problems of nuclear reactors. LT Ng

**102B. Ship Stability and Damage Control.**

(½ course)

Introduction to ship design and construction with special emphasis on damage control as related to stability considerations. Ship models will be used to determine metacentric height, righting arm, and associated stability characteristics. LT Ng

**102C. Leadership, the Naval Judicial System and Functions and Concepts of Naval Management.**

Conceptual approaches to leadership, interpersonal relationships, motivational practices and counseling techniques, ethical and moral responsibilities of persons in authority, extragroup relations as a representative of the Navy. Function of the division officer, study of military law. LT Ng

**†104A. Amphibious Operations I.**

The primary mission of the Marine Corps is to conduct amphibious warfare. The evolution of amphibious doctrines and techniques is examined with emphasis on the U. S. landings in the South Pacific during World War II. MAJ Rust

**†104B. Amphibious Operations II.**

Continuation of the examination of the evolution of amphibious warfare techniques with emphasis on the U. S. landings in the European Theater in World War II. Marine Corps operations in Korea are examined. A detailed study is made of the phases of an amphibious operation. MAJ Rust

**†104C. Uniform Code of Military Justice, Leadership. (½ course)**

The midshipman is given an indoctrination in military law, coordinated with the development of administrative leadership qualities. MAJ Rust

† These courses to be pursued by candidates for commissions in the Marine Corps or Marine Corps Reserve in lieu of courses 101A-101B-101C, 102A-102B-102C.

## ■ NEAR EASTERN LANGUAGES

(Department Office, 302 Royce Hall)

Amin Banani, Ph.D., *Professor of Persian and Persian History.*

† Arnold Band, Ph.D., *Professor of Hebrew.*

Seeger A. Bonebakker, Ph.D., *Professor of Arabic.*

Janos Eckmann, Ph.D., *Professor of Turkic Languages.*

Wolf Leslau, *Docteur-es-Lettres, Professor of Hebrew and Semitic Linguistics.*

Moshe Perlmann, Ph.D., *Professor of Arabic.*

Avedis K. Sanjian, Ph.D., *Professor of Armenian.*

Andreas Tietze, Ph.D., *Professor of Turkish.*

Pinhas Delougaz, Baccalaureate, *Professor in Residence of Near Eastern Archaeology.*

Giorgio Buccellati, Ph.D., *Associate Professor of Ancient Near East and History.*

Herbert A. Davidson, Ph.D., *Associate Professor of Hebrew.*

John Callender, Ph.D., *Assistant Professor of Egyptology.*

Thomas Penchoen, Ph.D., *Assistant Professor of Berber.*

Joseph Eliash, *Assistant Professor of Arabic.*



Suzan Akkan, Licence Diplome, *Lecturer in Turkish.*

Shimeon Brisman, *Lecturer in Hebrew.*

Jay D. Frierman, M.A., *Lecturer in Near Eastern Archaeology.*

Aaron Haddad, Ph.D., *Lecturer in Arabic.*

Gualtherus Juynboll, *Visiting Assistant Professor of Arabic.*

David L. Lieber, D.H.L., *Lecturer in Hebrew.*

Stanford Shaw, Ph.D., *Professor of History.*

### Bachelor of Art Degree

The degree is offered in Hebrew, Arabic and Ancient Near Eastern Civilizations. In each case the student must both meet the prerequisites and take the courses prescribed for majors.

For a Hebrew major the prerequisites are Hebrew 1A-1B-1C, 102A-102B-102C, 150A-150B or their equivalents. The student is required to take 16 quarter courses distributed as follows: Hebrew 103A-103B-103C; three courses from Hebrew 120A, 120B, 120C, 120D, 120E, 120F; two courses from 130A, 130B, 130C, 130D; two courses from Hebrew 140A, 140B, 140C, 140D, 160A, 160B; both 190A and 190B; three additional courses in Hebrew or Aramaic to be approved by Department Adviser; History 138A or 138B.

For an Arabic major the prerequisites are Arabic 1A-1B-1C, 102A-102B-102C, 150A-150B or their equivalents. The student is required to take 17 quarter courses distributed

as follows: 14 courses in Arabic selected with approval of Department Adviser from Arabic 103A-103B-103C, 111A-111B-111C, 113A-113B-113C, 130A-130B-130C, 140A-140B-140C, 141A-141B-141C, 180A-180B-180C, 199; one elective in the 200 series; History 134A, 134B.

For a major in Ancient Near Eastern Civilizations the prerequisites are History 1A-1B-1C, 9D, Anthropology 5A-5B-5C, Geography 10C, and (only for students taking option 3) Hebrew 1A-1B-1C and 102A-102B-102C (or their equivalents). The student is required to take 16 quarter courses including: Ancient Near Eastern 150A-150B, History 117, 200A-200B, 203; six quarter courses out of Ancient Near East 160A-160B, 161A-161B-161C, Art 101A-101B-101C, 104; and one of the following options: (1) Semitics 140A-140B, 141A-141B; (2) Ancient Near East 120A-120B-120C, 121A; (3) four courses out of Hebrew 120A-120B-120C-120D-120E-120F, Semitics 130. For recommended courses the stu-

† Absent on leave, 1970-1971.

dent will consult with the Departmental Adviser.

No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

#### Requirements for the Master's Degree

*General Requirements.* See pages 153-154.

*Department Program.* (1) The master's degree is offered in seven specialties: Ancient Near Eastern Civilizations, Arabic, Armenian, Hebrew, Persian, Semitics and Turkish. The candidate for the degree in Ancient Near Eastern Civilizations will be required to study two ancient languages one of which has to be one of the major languages of the Ancient Near East (Ancient Egyptian, Akkadian, or Hebrew), and the history and archaeology of the related area. The candidate for the degree in Hebrew will be required to study Hebrew plus one other Semitic language. The candidate for the degree in Semitics will be required to study three Semitic languages. The candidate for the degree in Arabic, Armenian or Persian will be required to continue to study his language of choice plus one other related language. The candidate for a degree in Turkish will be required to study two Turkic languages. The student may concentrate on either language or literature but will be required to do work in both. In addition, each candidate will be required to have competent knowledge of the history of his major culture area. (2) For admission to the program: a bachelor's degree, or its equivalent, in the language area chosen for the M.A. (3) Course requirements: a minimum of nine upper division and graduate level courses, of which at least six courses must be graduate level. All candidates will be required to take one quarter of Near Eastern Languages 200, Bibliography and Method. (4) The candidate must be able to read one modern European language other than English. The choice of the language will be determined in consultation with the departmental adviser. The student must pass the Graduate Foreign Language Reading Examination in this language by the end of the third quarter of residence. It is also strongly recommended that the student who intends to continue toward a Ph.D. degree acquire a knowledge of a second European language other than English while still a candidate for the M.A. (5) Final examination: the candidate will take a comprehensive final examination.

#### Requirements for the Doctor of Philosophy Degree in Near Eastern Languages and Literatures

*General Requirements.* See page 156.

*Requirements for the Program.* (1) A reading knowledge of two major Western languages other than English. The student is expected to take the examination in one of the two languages at the beginning of his first quarter in residence; the examination of the second not later than at the beginning of his fourth quarter. The choice of languages must be approved by the adviser. (2) The candidate for the degree may concentrate either in language or in literature, or, in the case of the Ancient Near Eastern field, in a combination of both with Near Eastern archaeology. In each case, upon entrance to the program he is expected to have fulfilled the requirements of the M.A. in his field. (A) A candidate in languages is expected to take the equivalent of one year of general linguistics and one year of comparative grammar in his field of concentration, e.g., Semitics or Turkic. Moreover, he is required to achieve competence in three languages taken from his field of concentration with particular emphasis on two major languages. It is mainly the structural mastery of the languages and familiarity with their development and their position within the appropriate family of languages that are required. The student is advised to acquaint himself with the historical, literary, religious, and social background of the various languages of his interest. His fields of examination will be three languages and the literary and historical background of at least two of them. (B) In the case of a candidate specializing in literature, competence in two languages is required; his second language should be a literary language taken from the cultural area related to his first language; e.g. a Hebraist can choose Aramaic, Akkadian, Arabic, or Yiddish; an Arabist can choose Persian or Turkish, and so on. The candidate will be required to be familiar with the history of literary criticism and methods of literary research as offered by the various departments of the University, particularly the course in literary criticism offered by the English Department or the course in the Methodology of Comparative Literature. His field of examination will be the literatures written in two languages within the cultural area of his concentration, and the historical and cultural background of these languages with emphasis on one of them. (C) A candidate interested in the

Ancient Near Eastern Civilizations will be required to emphasize in his preparation the philological and linguistic aspects of the languages of his choice, and to be familiar with the literature, history and archaeology of the major areas of the Ancient Near East. His fields of examination will be two languages, with emphasis on one of them, and the history and archaeology of one related area.

The student is advised to take his M.A. degree prior to his Ph.D. degree.

## Ancient Near East

(Akkadian, Aramaic and Ugaritic are listed under Semitics).

### Upper Division Courses

#### \$120A-120B-120C. Elementary Ancient Egyptian.

Lecture, three hours; laboratory, two hours. Prerequisite: consent of the instructor. Grammar and texts. Mr. Callender

#### †121A-121B-121C. Intermediate Ancient Egyptian.

Three hours. Prerequisite: courses 120A-120B-120C. Readings in Ancient Egyptian literature. Mr. Callender

#### \$122A-122B. Late Egyptian.

Three hours. Prerequisite: courses 121A-121B-121C and consent of the instructor. An introduction to late Egyptian grammar and reading of both hieroglyphic and hieratic texts. The quarters this course is offered vary from year to year. Check with department. Mr. Callender

#### \$123A-123B. Coptic.

Three hours. Prerequisite: consent of the instructor. An introduction to Coptic grammar and reading of Coptic texts. The quarters this course is offered vary from year to year. Check with department. Mr. Callender

#### \*150A-150B. Survey of Ancient Near Eastern Literatures in English.

Lecture, three hours. Knowledge of original languages not required. Courses 150A and 150B may be taken independently for credit. 150A: Mesopotamia and Hittites; 150B: Egypt and Syria-Palestine. Mr. Buccellati, Mr. Callender

#### 160A-160B. Introduction to Near Eastern Archaeology.

Lecture, three hours. Terminology, geography, principles, strategy of research, bibliography and a general survey of Near Eastern archaeology. Mr. Frierman

#### 161A-161B-161C. Archaeology of Mesopotamia.

Prerequisite: consent of the instructor. Survey of the main archaeological periods in Mesopotamia with special emphasis on late prehistoric and early historical periods and with reference to neighboring cultural areas. Mr. Delougaz

#### 199. Special Studies in the Ancient Near East. (½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

### Graduate Courses

#### 250. Seminar in Ancient Mesopotamia.

Prerequisite: consent of the instructor. Selected topics on the political, social and intellectual history of ancient Mesopotamia. May be repeated for credit. Mr. Buccellati

#### 260. Seminar in Ancient Near Eastern Archaeology.

Lecture, two hours. Prerequisite: consent of the instructor. May be repeated for credit. Mr. Delougaz

#### 261. Practical Field Archaeology. (½ to 2 courses)

Two hours. Prerequisite: consent of the instructor. Participating in archaeological excavations or other archaeological research in the Near East under supervision of the staff. May be repeated for credit. The Staff

### Individual Study and Research

#### 596. Directed Individual Studies. (½ to 2 courses)

The Staff

#### 597. Preparation for the Master's Comprehensive Examination or the Doctoral Qualifying Examination. (½ to 2 courses)

The Staff

#### 599. Dissertation Research and Preparation. (½ to 2 courses)

The Staff

### Related Courses in Other Departments

#### Art 101A-101B-101C. Egyptian Art and Archaeology.

104. Art of the Ancient Near East.

210. Egyptian Art.

#### History 117. History of Ancient Egypt.

140A-140B. History of Ancient Mesopotamia and Syria.

240J. Topics in History.

## Arabic

### Lower Division Courses

#### †1A-1B-1C. Elementary Arabic.

Sections meet seven hours weekly. Basic structure. The Staff

### Upper Division Courses

#### †102A-102B-102C. Intermediate Arabic.

Lecture, four hours; laboratory, two hours; Arabic lecture, one hour. Prerequisite: courses 1A-1B-1C or consent of the instructor. Readings in both Classical and Modern Arabic. Composition, conversation and a weekly lecture in Arabic. The Staff

#### †102K. Intensive Intermediate Arabic. (2 courses)

Prerequisites: courses 1A-1B-1C or consent of the instructor. Offered in the summer only. Readings in both classical and modern Arabic, composition, conversation. The Staff

\* Not to be given, 1970-1971.

† Given in alternate years; not to be given 1970-1971.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given, 1970-1971.

**†103A-103B-103C. Advanced Arabic.**

Lecture, four hours; laboratory, two hours; Arabic lecture, one hour. Prerequisite: courses 102A-102B-102C or consent of the instructor. Review of grammar, continued reading of literary works. Composition, conversation and a weekly lecture in Arabic.

The Staff

**†111A-111B-111C. Spoken Egyptian Arabic.**

Three hours. Prerequisite: consent of the instructor. Introduction to the contemporary Arabic dialect of Egypt. Phonology, morphology and syntax will be presented with emphasis on oral practice.

Mr. Haddad

**†113A-113B-113C. Spoken Iraqi Arabic.**

Three hours. Prerequisite: consent of the instructor. Introduction to the contemporary Arabic dialect of Iraq. Phonology, morphology and syntax will be presented with emphasis on oral practice.

The Staff

**†130A-130B-130C. Classical Arabic Texts.**

Lecture, three hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. Reading and interpretation of texts from classical Arabic literature: Koran, historiography, biography, geography and travelogues, poetry.

The Staff

**132A-132B-132C. Philosophical Texts in Classical Arabic.**

Lecture, three hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. A study of excerpts from the major work of medieval Arab philosophy.

Mr. Bonebakker

**†140A-140B-140C. Modern Arabic Texts.**

Lecture, three hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. Readings and interpretation of modern Arabic texts: newspaper articles, modern fiction, poetry, folklore.

Mr. Haddad

**†141A-141B-141C. Modern Arabic Literature.**

Prerequisite: course 140 or its equivalent. A study of modern literary styles and trends, as represented by selected texts in Arabic.

The Staff

**150A-150B. Survey of Arabic Literature in English.**

Lecture, three hours. Knowledge of Arabic is not required. Courses 150A and 150B may be taken independently for credit.

Mr. Bonebakker

**180A-180B-180C. Structure of Literary Arabic.**

Lecture, three hours. Prerequisite: consent of the instructor. A survey of the basic structural features of literary Arabic with emphasis on the verbal system.

The Staff

**199. Special Studies in Arabic. (½ to 2 courses)**

Prerequisite: consent of the instructor. The Staff

**Graduate Courses****220A-220B-220C. Islamic Texts.**

Lecture, two hours. Scripture and interpretation in Islam; traditional scholarship; historical and literary problems of modern research; selections from various fields of Arabic letters. May be repeated for credit.

Mr. Perlmann

**230A-230B-230C. Arabic Poetry.**

Lecture, two hours. Readings in Arabic poetry from various periods.

The Staff

**240A-240B-240C. Arab Historians.**

Lecture, two hours. Readings from the works of the most outstanding Arab historians of the classical period of Islam.

Mr. Perlmann

**250A-250B-250C. Seminar in Arabic Literature.**

Two hours.

Mr. Bonebakker

**Individual Study and Research****596. Directed Individual Study. (½ to 2 courses)**

The Staff

**597. Examination Preparation. (½ to 2 courses)**

The Staff

**599. Dissertation Research and Preparation.**

(½ to 2 courses)

The Staff

**Related Courses in Another Department**

**History 134A-134B. Near and Middle East from 600 A.D.**

**267A-267B. Seminar in Near Eastern History.**

**Armenian****Upper Division Courses****†101A-101B-101C. Elementary Modern Armenian.**

Three hours. Armenian grammar, conversation and exercises.

The Staff

**†102A-102B-102C. Intermediate Modern Armenian.**

Three hours. Prerequisite: courses 101A-101B-101C or the equivalent. Reading of selected texts, composition and conversation.

The Staff

**†103A-103B. Advanced Modern Armenian.**

(Formerly numbered 103A-103B-103C.) Three hours. Prerequisite: courses 102A-102B-102C or the equivalent. Readings in advanced modern Armenian texts.

Mr. Sanjian

**§130A-130B. Elementary Classical Armenian.**

(Formerly numbered 130A-130B-130C.) Three hours. Grammar of the Classical Armenian language and readings of selected texts.

Mr. Sanjian

**§131A-131B. Intermediate Classical Armenian.**

(Formerly numbered 131A-131B-131C.) Three hours. Prerequisite: courses 130A-130B or the equivalent. Reading of selected texts.

Mr. Sanjian

**†132A-132B. Advanced Classical Armenian.**

(Formerly numbered 132A-132B-132C.) Three hours. Prerequisite: courses 131A-131B or the equivalent. Readings in advanced classical Armenian texts.

Mr. Sanjian

**†150A-150B. Survey of Armenian Literature in English.**

Three hours. Knowledge of Armenian is not required. Courses 150A and 150B may be taken independently for credit.

Mr. Sanjian

† Given in alternate years; not to be given 1970-1971.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years. To be given, 1970-1971.

**†160A-160B. Armenian Literature of the 19th and 20th Centuries.**

Three hours. Prerequisite: 102A-102B-102C or the equivalent. Reading of texts and discussion of various genres of modern Armenian literature, within the context of the Armenian Cultural Renaissance. Mr. Sanjian

**199. Special Studies in Armenian Language and Literature. (½ to 2 courses)**

Prerequisite: Consent of the instructor. The Staff

**Graduate Courses****§210. History of the Armenian Language.**

Three hours. Prerequisite: consent of the instructor. The development of the Armenian language in its various stages: Classical, Middle, and Modern. Mr. Sanjian

**§220. Armenian Literature of the Golden Age (A.D. 5th Century).**

Three hours. Prerequisite: courses 131A-131B or the equivalent. Reading of texts and discussion of literary genres; the course will concentrate on both original works and those translated from Greek and Syriac. Mr. Sanjian

**250A-250B. Seminar in Armenian Literature.**

Three hours. Prerequisite: consent of the instructor. Selected topics from various periods of Armenian literature. May be repeated for credit. Mr. Sanjian

**290. Seminar in Armenian Paleography.**

Three hours. Prerequisite: consent of the instructor. Discussion of variety of Armenian scripts and training in the use of manuscripts. Mr. Sanjian

**Individual Study and Research****596. Directed Individual Study. (½ to 2 courses).**

Mr. Sanjian

**597. Examination Preparation. (½ to 2 courses)**

Mr. Sanjian

**599. Dissertation Research and Preparation.**

(½ to 2 courses) Mr. Sanjian

**Related Courses in Other Departments****History 131A-131B-131C. Armenian History.**

132. The Caucasus since 1801.

207. Armenian Intellectual History.

228. Methods in Armenian Oral History.

230S. Advanced Historiography: Armenian.

240. Topics in History: Armenia and the Caucasus.

286A-286B. Seminar in Armenian History.

**Indo-European Studies 150. Introduction to Indo-European Linguistics.****Berber****Upper Division Courses****‡101A-101B-101C. Elementary Berber.**

Lecture, three hours; laboratory, two hours. Development of oral proficiency and analysis of basic grammatical structure. Mr. Penchoen

**‡102A-102B-102C. Advanced Berber.**

Prerequisite: courses 101A-101B-101C or consent of the instructor. Advanced study of Berber. Regional and stylistic variants in folk literature. Mr. Penchoen

**‡120A-120B-120C. Introduction to Berber Literature.**

Three hours. Prerequisites: courses 102A-102B-102C or consent of the instructor. The development of Berber literary forms: systematic analysis of texts and a study of Berber writing systems. Mr. Penchoen

**199. Special Studies in Berber Languages.**

(½ to 2 courses)

Prerequisite: consent of the instructor. Study based on the requirements of the individual student. Mr. Penchoen

**Related Courses in Other Departments****History 133A-133B. History of North Africa from the Muslim Conquest.****Linguistics 225M. Linguistics Structures: Berber.****Caucasian Languages****‡111A-111B-111C. Elementary Georgian.**

Three hours. Prerequisite: consent of the instructor. Script, grammar, simple reading in this main Caucasian language.

**199. Special Studies in Caucasian Languages.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**Hebrew****Lower Division Courses****‡1A-1B-1C. Elementary Hebrew.**

Lecture, three hours; laboratory, two hours. Structural principles of grammar. Students who have previous knowledge of reading and some vocabulary are advised to take courses 10A-10B-10C. Students with credit for 10A will not receive credit for Hebrew 1A. Students with credit for 10B will not receive credit for 1B or 1C. The Staff

**‡10A-10B-10C. Accelerated Elementary Hebrew.**

Prerequisite: consent of the instructor. Structural principles of grammar. Open to students who wish to cover the equivalent of two years college Hebrew

‡ Given in alternate years, not to be given in 1970-1971.

† Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given in 1970-1971.



in one academic year; recommended for students who have previously studied the rudiments of Hebrew. Students with credit for Hebrew 1A will not receive credit for 10A. Students with credit for 1B and/or 1C will not receive credit for 10B. The Staff

#### Upper Division Courses

#### 102A-102B-102C. Intermediate Hebrew.

Five hours. Prerequisite: courses 1A-1B-1C or the equivalent. Amplification of grammar; reading of vocalized texts from modern, Biblical, and Medieval/Rabbinic literature. The Staff

#### 102K. Intensive Intermediate Hebrew. (3 courses)

Prerequisites: courses 1A-1B-1C or the equivalent. Offered in the summer only. Amplification of grammar; reading of vocalized texts from modern, Biblical and Medieval/Rabbinic literature. Mr. Davidson

#### 103A-103B-103C. Advanced Hebrew.

Five hours. Prerequisite: courses 102A-102B-102C or the equivalent. Reading of unvocalized texts, primarily modern literature. The Staff

#### 103K. Intensive Advanced Hebrew. (2 courses)

Prerequisites: courses 102A-102B-102C or equivalent. Offered in the summer only. Reading of unvocalized texts, primarily modern literature. The Staff

#### 120A-120F. Biblical Texts.

Three hours. Prerequisite: courses 102A-102B-102C or the equivalent. Translations and analysis of Old Testament texts with special attention given to texts of primary literary and historical importance. Courses 120A, 120B, 120C, 120D, 120E, and 120F may be taken independently for credit. The Staff

#### 130A-130D. Medieval Hebrew Texts.

Three hours. Prerequisite: courses 103A-103B-103C or consent of the instructor. Readings in medieval Hebrew prose and poetry with special attention to literature of the "Golden Age." Courses 130A, 130B, 130C, and 130D may be taken independently for credit. Mr. Davidson

#### 135A-135B. Advanced Medieval Texts.

Three hours. Prerequisite: two courses from 130A-130B-130C-130D or the equivalent. Readings in genres such as medieval Hebrew Bible commentaries, the *Musar* literature, and philosophy. Each course will be offered in alternate springs. Mr. Davidson

#### 140A-140D. Modern Hebrew Poetry and Prose.

Three hours. Prerequisite: courses 103A-103B-103C and consent of the instructor. A study of the major Hebrew writers of the past one hundred years: prose—Mendele, Abad, Ha'am, Agnon, Yizhar; poetry—Bialik, Tchernichovsky, Greenberg, Shlonsky, Alterman, Amihai. The Staff

#### 150A-150B. Survey of Hebrew Literature in English.

Three hours. Knowledge of Hebrew not required. Courses 150A and 150B may be taken independently for credit. 150A: From Biblical period to 1300; 150B: From 1300 to the present day. Mr. Band

#### 160A-160B. The Hebrew Essay.

Three hours. Prerequisite: courses 103A-103B-103C or consent of the instructor. The Hebrew essay from its rise in Europe in the late eighteenth century to the contemporary Israeli essay; the liter-

ary, political, sociological, philosophical, and scholarly essay will be studied. Each course will be offered in alternate spring quarters. The Staff

#### 5190A-190B. Survey of Hebrew Grammar.

Two hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. Descriptive and comparative study of the Hebrew phonology and morphology. Mr. Leslau

#### 199. Special Studies in Hebrew. (½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

#### Graduate Courses

#### 210A-210B. History of the Hebrew Language.

Prerequisite: courses 103A-103B-103C or consent of the instructor. The development of the Hebrew language in its various stages: Biblical, Mishnaic, Medieval, Modern, and Israeli; differences in vocabulary, morphology, syntax, and the influence of other languages; problems of language expansion in Israeli Hebrew. The Staff

#### 220A-220B-220C. Studies in the Text of the Hebrew Bible.

Three hours. A critical study of the Hebrew text in relation to the major versions; philological, comparative, literary, and historical study of various Biblical books. The Staff

#### 230A-230B-230C. Seminar in Medieval Hebrew Literature.

Three hours. Mr. Davidson

#### 241A-241B-241C. Studies in Modern Hebrew Prose Fiction.

Studies in specific problems and trends in Hebrew prose fiction of the last two centuries. Mr. Band

#### 242A-242B-242C. Studies in Modern Hebrew Poetry.

Studies in specific problems and trends in Hebrew poetry of the last two centuries. Mr. Band

#### Individual Study and Research

#### 596. Directed Individual Study. (½ to 2 courses)

The Staff

#### 597. Examination Preparation. (½ to 2 courses)

The Staff

#### 599. Dissertation Research and Preparation.

(½ to 2 courses)

The Staff

#### Related Courses in Other Departments

#### History 138A-138B. Jewish History.

## Islamic

#### Individual Study and Research

#### 596. Directed Individual Study. (½ to 2 courses)

The Staff

† Given in alternate years, not to be given, 1970-1971.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given, 1970-1971.

- 597. Examination Preparation.** (½ to 2 courses)  
The Staff
- 598. Thesis Research and Preparation.**  
(½ to 2 courses) The Staff
- 599. Dissertation Research and Preparation.**  
(½ to 2 courses) The Staff

Related Courses in Another Department

- History 135. Introduction to Islamic Culture.  
136. Islamic Institutions and Political Ideas.  
209A-209B. The Modern Middle East.

## Near Eastern Languages

Upper Division Course

- 198. Special Studies in Near Eastern Languages.**  
(½ to 2 courses)  
Prerequisite: consent of the instructor. The Staff

Graduate Courses

- 200. Bibliography and Method of Near Eastern Languages and Literatures.**  
Two hours. Prerequisite: consent of the instructor. One quarter required for the M.A. in Near Eastern Languages and Literatures. An introduction to the bibliography of all the Near Eastern Languages: morphology, lexicography, and literature. May be repeated for credit. The Staff

- §241. Folklore and Mythology of the Near East.**  
(Same as Folklore 241.) Prerequisite: Folklore 101 or the equivalent. The Staff

- †290. Seminar in Paleography.**  
Three hours. To provide the students with the ability to cope with varieties of manuscripts. Mr. Banani

Individual Study and Research

- 596. Directed Individual Study.** (½ to 2 courses)  
The Staff
- 597. Examination Preparation.** (½ to 2 courses)
- 599. Dissertation Research and Preparation.** (½ to 2 courses)  
The Staff

## Persian

Upper Division Courses

- †101A-101B-101C. Elementary Persian.**  
Lecture, four hours; laboratory, two hours. Mr. Banani

- 102A-102B-102C. Advanced Persian.**  
Lecture, three hours; laboratory, two hours. Prerequisite: courses 101A-101B-101C or the equivalent. Mr. Banani

† Given in alternate years, not to be given 1970-1971.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given, 1970-1971.

## 150A-150B. Survey of Persian Literature in English.

Three hours. Knowledge of Persian not required. Courses 150A and 150B may be taken independently for credit. Mr. Banani

- 199. Special Studies in Persian.** (½ to 2 courses)  
Prerequisite: consent of the instructor. The Staff

Graduate Courses

- 220A-220B. Classical Persian Texts.**  
Three hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. Study of selected Classical Persian texts. Mr. Banani

- 250. Seminar in Persian Literature.**  
Three hours. Prerequisite: courses 102A-102B-102C and Persian 199 or consent of the instructor. Mr. Banani

Individual Study and Research

- 596. Directed Individual Study.** (½ to 2 courses)  
The Staff
- 597. Examination Preparation.** (½ to 2 courses)  
The Staff
- 599. Dissertation Research and Preparation.** (½ to 2 courses)  
The Staff

Related Courses in Other Departments

- History 211A-211B-211C. Islamic Iran.
- Indo-European Studies 160. Elementary Sanskrit.  
161. Intermediate Sanskrit.  
162. Advanced Sanskrit.  
210. Indo-European Linguistics: Advanced Course.  
230A-230B. Old Iranian.  
231A-231B. Middle Iranian.  
260A-260B. Seminar in Indo-European Mythology.  
280A-280B. Seminar in Indo-European Linguistics.

## Semitics

Upper Division Courses

- †101A-101B-101C. Elementary Amharic (Modern Ethiopic).**  
Lecture, three hours. Elements of Amharic, the national language of Ethiopia; grammar and reading of texts. Mr. Leslau

- 102A-102B-102C. Advanced Amharic (Modern Ethiopic).**  
Lecture, three hours. Prerequisite: Semitics 101A-101B-101C or consent of the instructor. Mr. Leslau

- §130. Biblical Aramaic.**  
Three hours. Prerequisite: Hebrew 102A-102B-102C or the equivalent. Grammar of Biblical Aramaic and reading of texts. Mr. Leslau

**140A-140B. Elementary Akkadian.**

Lecture, three hours. Elementary grammar and reading of texts in standard Babylonian.

Mr. Buccellati

**141A-141B. Advanced Akkadian.**

Lecture, three hours. Prerequisite: consent of the instructor. Selected grammatical and lexical questions; reading of Old Babylonian and literary texts.

Mr. Buccellati

**Graduate Courses****201A-201B-201C. Old Ethiopic.**

Lecture, two hours. Grammar of Old Ethiopic and reading of texts.

Mr. Leslau

**202A-202B-202C. Readings in Old Ethiopic Literature.**

Lecture, two hours. Prerequisite: Semitics 201A-201B-201C.

Mr. Leslau

**209A-209B-209C. Comparative Study of the Ethiopian Languages.**

Two hours. Prerequisite: consent of the instructor. Comparative study of the various Semitic Ethiopian languages: Geez, Tigrinya, Tigre, Amharic, Harari, Gurage, and Gafat.

Mr. Leslau

**210A-210B. Ancient Aramaic.**

Two hours. Prerequisite: Hebrew 103A-103B-103C or the equivalent. Study of the grammar and vocabulary of Ancient Aramaic and reading of the surviving inscriptions and texts.

The Staff

**215A-215B-215C. Syriac.**

Two hours. Morphology and syntax of the Syriac language; readings in the Syriac translation of the Bible and Syriac literature.

The Staff

**220A-220B-220C. Ugaritic.**

Two hours. Prerequisite: Hebrew 103A-103B-103C or the equivalent. Study of the Ugaritic language and literature.

The Staff

**240. Seminar in Akkadian Language and Literature.**

Two hours. Prerequisite: consent of the instructor. May be repeated for credit.

Mr. Buccellati

**280A-280B-280C. Seminar in Comparative Semitics.**

Two hours.

Mr. Leslau

**290A-290B-290C. Comparative Morphology of the Semitic Languages.**

Two hours. Prerequisite: Semitics 280A-280B-280C or consent of the instructor. Comparative study of the noun and verb of the various Semitic languages (Arabic, Hebrew, Ethiopic, Akkadian, and Aramaic).

Mr. Leslau

**Individual Study and Research****596. Directed Individual Study. (½ to 2 courses)**

The Staff

**597. Examination Preparation. (½ to 2 courses)**

The Staff

**599. Dissertation Research and Preparation.**

(½ to 2 courses)

The Staff

**Related Courses in Other Departments**

**Art 104. Art of the Ancient Near East.**  
**History 200A-200B. History of the Ancient East.**

**Turkic Languages****Upper Division Courses****‡101A-101B. Elementary Turkish.**

Lecture, three hours; laboratory and drill, two hours. Grammar, reading, conversation and elementary composition drills.

Mr. Tietze

**‡102A-102B. Intermediate Turkish.**

Lecture, three hours; laboratory and drill, two hours. Prerequisite: courses 101A-101B or the equivalent. Continuing study of grammar, readings, conversation and composition drills.

Mr. Tietze

**‡103A-103B. Advanced Turkish.**

Lecture, three hours; laboratory and drill, two hours. Prerequisite: courses 102A-102B or equivalent. Reading in modern literature and social science texts; conversation and composition.

Mr. Tietze

**\*110A-110B-110C. Old and Middle Turkic.**

Three hours. Prerequisite: 102A or consent of the instructor. Grammar, readings in 8th to 14th century texts.

Mr. Eckmann

**111A-111B-111C. Chagatai.**

Three hours. Prerequisite: 102A or consent of the instructor. Literary language of Central Asia before the Soviet era. Grammar, readings in 15th to 19th century texts.

Mr. Eckmann

**112A-112B-112C. Uzbek.**

Three hours. Prerequisite: 102A or consent of the instructor. Grammar, reading of literary and folkloristic texts.

Mr. Eckmann

**\*113A-113B-113C. Kirghiz.**

Three hours. Prerequisite: courses 101A-101B or consent of the instructor. Grammar, reading of literary and folkloristic texts.

Mr. Eckmann

**190A-190F. Survey of the Turkic Languages.**

Prerequisites: course 102A or consent of the instructor. 190A-190B-190C: Comparative Turkic grammar classification, structure, comparative phonology, morphology, and syntax. 190D-190E-190F: Turkic historical grammar, old literary languages. Developments in phonology, morphology, and syntax from the 8th to the 20th centuries.

Mr. Eckmann

**199. Special Studies in Turkic Languages.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

\* Not to be given, 1970-1971.

† Given in alternate years, not to be given in 1970-1971.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given, 1970-1971.

## Graduate Courses

**210A-210B-210C. Ottoman.**

Two hours. Prerequisite: courses 103A-103B or consent of the instructor. Readings of literary and historical texts. May be repeated for credit.

Mr. Tietze

**211. Ottoman Diplomatics.**

Prerequisites: courses 210A-210B-210C or the equivalent. Organization and contents of the Ottoman archives; reading and discussion of documents and registers. Introduction to the use of Ottoman archive materials as a source for historical research.

Mr. Shaw

## Individual Study and Research

**596. Directed Individual Study. (½ to 2 courses)**

The Staff

**597. Examination Preparation. (½ to 2 courses)**

The Staff

**599. Dissertation Research and Preparation.**

(½ to 2 courses)

The Staff

## ■ NEUROSCIENCE

An interdisciplinary program of graduate training leading to the Ph.D. in Neuroscience is offered, utilizing facilities, resources, and activities of the Brain Research Institute and administered by an interdepartmental degree committee.

Applicants must satisfy minimum requirements for admission to the Graduate Division (page 29). The program is designed particularly for students from the health and life sciences, but applications are encouraged from prospective trainees from the physical sciences and engineering as well.

All students will be given instruction designed to provide basic knowledge of the anatomy, physiology, and chemistry of neural function. Thereafter, the student may pursue an educational experience through any of eight subdisciplines: neuroanatomy, neurochemistry, neurophysiology, behavior, neurocybernetics and communications, neuroendocrinology, neuropharmacology, neuroimmunology.

The curriculum includes a major commitment to appropriate courses listed by departments in addition to offerings shown below.

Prospective applicants may inquire concerning the availability of this curriculum by consulting J. D. French, 73-364 Brain Research Institute, Center for the Health Sciences.

† Native speakers of the language will not normally be eligible for this course.

## Related Courses in Another Department

History 139A-139B-139C. History of the Turks.

201A. History of the Eurasian Nomadic Empires.

## Urdu

## Upper Division Courses

**†101A-101B-101C. Elementary Urdu.**

Three hours. Prerequisite: consent of the instructor. Elements of Urdu, the language of Pakistan.

**199. Special Studies in Urdu. (½ to 2 courses)**

Prerequisite: consent of the instructor.

## Related Courses in Another Department

South Asian Languages 171A-171B-171C.  
Hindi.

## Graduate Courses

**200. Clinical Concepts in the Neurosciences.**

(½ course)

Prerequisite: consent of instructor. Presents information concerning neurological and psychiatric disorders for students from basic science backgrounds.

Mr. Kales, Mr. Walter

**254. Interdisciplinary Research Seminar. (½ course)**

Prerequisite: consent of instructor. Lectures and discussions concern many different disciplinary approaches to knowledge of brain function. The subject matter serves to broaden the experience of students studying in different fields other than that of the lecturer and offers new information in depth from students in fields closely related to the subject discussed.

Mr. French

**256. Survey of the Basic Neurological Sciences.**

(½ course)

Prerequisite: consent of instructor. Summary information concerning methodologies utilized in different research approaches to brain research (e.g., neurophysiology, neuroendocrinology, brain ultrastructure, neuropharmacology, and others) and brief review of present state of knowledge available from each. For students with interest in interdisciplinary aspects of brain research.

Mr. Kales, Mr. Sterman

**259. Neurophysiology of Behavior: the Fetus, Newborn, and Infant. (½ course)**

Prerequisite: consent of instructor. An integrated review of neuroanatomic, neurophysiologic, and behavioral development of human and animal fetuses and infants. Behavior will be correlated with the development of the brain during this period of rapid change in both.

Mr. Parmelee

**599. Dissertation Research for Ph.D. Candidates.**

(1 to 2 courses)

For students requiring special instruction or time to work on dissertation.

Mr. French

## ■ NURSING

(Department Office, 12-139C Center for the Health Sciences)

- Dorothy E. Johnson, R.N., M.P.H., *Professor of Pediatric Nursing.*  
 Lulu Wolf Hassenplug, R.N., M.P.H., Sc.D., *Emeritus Professor of Nursing.*  
 Imogene D. Cahill, R.N., M.N., M.A., Ed.D., *Associate Professor of Nursing.*  
 Harriet C. Moidel, R.N., M.A., *Associate Professor of Medical-Surgical Nursing.*  
 Agnes A. O'Leary, R.N., M.P.H., *Associate Professor of Public Health Nursing and  
 Lecturer in Public Health Nursing (Vice-Chairman of the Department).*  
 Jeanine Auger, R.N., M.S., Ph.D., *Assistant Professor of Nursing.*  
 Karen B. Bell, R.N., M.S., *Assistant Professor of Psychiatric Nursing.*  
 Marie F. Branch, R.N., M.S., *Assistant Professor of Nursing.*  
 Pamela Brink, R.N., M.S., *Assistant Professor of Nursing.*  
 Bonnie Bullough, R.N., M.S., M.A., Ph.D., *Assistant Professor of Nursing.*  
 Beatrice M. Dambacher, R.N., M.S., N.Sc.D., *Assistant Professor of Psychiatric Nursing.*  
 Grace L. Deloughery, R.N., M.P.H., Ph.D., *Assistant Professor in Residence in Nursing.*  
 Afaf I. Meleis, R.N., M.S., Ph.D., *Assistant Professor of Nursing.*  
 Grace A. Millington, R.N., M.A., *Assistant Professor of Nursing.*  
 Lynn R. Purinton, R.N., M.N., *Assistant Professor of Nursing.*  
 Phyllis A. Putnam, R.N., Ph.D., *Assistant Professor of Nursing.*  
 Donna L. Vredevoe, Ph.D., *Assistant Professor of Nursing.*  
 Betty L. Williams, R.N., M.S., *Assistant Professor of Nursing.*  
 ———, *Assistant Professor of Nursing.*  
 ———, *Assistant Professor of Nursing.*  
 Christina W. Flynn, R.N., M.S., *Instructor in Nursing.*  
 Kristine Gebbie, R.N., M.N., *Instructor of Nursing.*  
 Jean A. Kerr, R.N., M.S., *Instructor in Nursing.*  
 Helen F. McGrane, R.N., M.N., *Instructor of Nursing.*  
 Marjorie Muecke, R.N., M.A., *Instructor of Nursing.*  
 Madlyn Lee Schmidt, R.N., M.N., *Instructor of Nursing.*  
 Leonide Tanner, R.N., M.S., *Instructor of Nursing.*



- Clara Arndt, R.N., M.S., *Lecturer in Nursing Service Administration.*  
 Elizabeth DeSantis, R.N., M.S., *Lecturer in Nursing.*  
 Charles K. Ferguson, Ed.D., *Lecturer in Nursing.*  
 Jeva-Jurate Kades, R.N., M.S., *Lecturer in Nursing.*  
 Corrine Loing, R.N., M.N., *Lecturer in Nursing.*  
 Beryl Lovaas, R.N., M.N., *Lecturer in Nursing.*  
 Betty Neuman, R.N., M.S., *Lecturer in Psychiatric Nursing.*  
 Joan P. Riehl, R.N., M.S., *Lecturer in Nursing.*  
 G. Marjorie Squaires, R.N., M.A., *Lecturer in Nursing.*  
 Muriel Uprichard, Ph.D., *Lecturer in Nursing and Associate Research Psychologist.*  
 Mary A. Wallace, R.N., M.S., *Lecturer in Nursing.*  
 Joan Wilcox, R.N., M.S., *Lecturer in Nursing.*



- Rachel A. Ayers, R.N., M.S., *Assistant Clinical Professor of Nursing Service Administration.*  
 Jamella M. Bell, R.N., M.S., *Assistant Clinical Professor of Nursing Service Administration.*  
 Cynthia A. Dauch, R.N., Ed.D., *Assistant Clinical Professor of Public Health Nursing.*

- Evelyn M. Hamil, R.N., M.N., *Assistant Clinical Professor of Nursing Service Administration.*
- Barbara W. Madden, R.N., M.S., *Assistant Clinical Professor of Medical-Surgical Nursing.*
- Julia Ilene Toten, R.N., M.P.H., *Assistant Clinical Professor of Public Health Nursing.*
- Katherine M. Bryan, R.N., B.S., *Clinical Instructor in Public Health Nursing.*
- Edith M. Cole, R.N., B.S., *Clinical Instructor in Psychiatric Nursing.*
- Dorothy J. Hicks, R.N., B.S., *Clinical Instructor in Medical-Surgical Nursing.*
- Eleanor E. Hicks, R.N., B.S., *Clinical Instructor in Psychiatric Nursing.*
- Mary Louise Jarvis, R.N., *Clinical Instructor in Public Health Nursing.*
- Ina B. Knight, R.N., M.S., *Clinical Instructor in Public Health Nursing.*
- Jerry G. Peers, R.N., B.S., *Clinical Instructor in Surgical Nursing.*
- Vera Louise Thompson, R.N., M.S., *Clinical Instructor in Public Health Nursing.*
- Bertha B. Unger, R.N., M.A., *Clinical Instructor in Psychiatric Nursing.*
- Elsie M. Beard, R.N., M.S., *Field Work Supervisor.*
- Sheila G. Cadman, R.N., M.A., *Field Work Supervisor.*

The School of Nursing admits students of junior or higher standing and offers curricula leading to the degrees of Bachelor of Science and Master of Nursing.

#### CURRICULA OFFERED FOR THE BACHELOR OF SCIENCE DEGREE

##### Preparation for the Major

Completion of 21 courses of college work including the courses listed on page 86 of this catalog or the equivalent.

##### The Major

At least 23 courses of required upper division nursing courses and elective courses designed to prepare university women for professional nursing responsibilities in the care of the patient and his family.

#### REGISTERED NURSES

##### Preparation for the Major

Same as baccalaureate program.

##### The Major

A minimum of 23 courses of coordinated upper division nursing and elective courses planned on the basis of professional need.

##### Upper Division Courses

#### 101A-101B. Pathophysiological Basis for Nursing Measures.

Lecture, two hours; laboratory, six hours. Prerequisites: Medical Science 101A and enrollment in School of Nursing. Study of the theory underlying and practice in the nurses' participation in the medical management of patients. Discussion and laboratory are focused on pathophysiological basis for medical management and nursing care of patients. Laboratory includes practice in selected nursing measures and in evaluation of patients' response to treatment.

The Staff

#### 102A-102B. The Development of Modern Nursing. (½ course each)

Lecture, two hours. Prerequisites: junior standing and acceptance by the School of Nursing for the baccalaureate program in nursing. Study of the evolution of nursing. Content focuses on its historical base with a consideration of the interpersonal and moral and legal ramifications of the formal and informal components of the social systems in which nursing is practiced today.

Mrs. Moidel, Miss Uprichard

#### 104A-104B. Nursing Science.

Lecture, two hours; laboratory, eight hours. Prerequisite: accepted by School of Nursing for baccalaureate program in nursing. 104A and 104B can be taken in either sequence. A synthesis and ordering of knowledge about biopsychosocial man through study of integrated behavioral systems as they operate through the life cycle and within the usual fluctuations of the environment.

Mrs. Kades

#### 105. Behavior in Illness.

Lecture, two hours; laboratory, eight hours. Prerequisite: courses 104A-104B. Study of the nature of illness and wellness, the adaptive responses and the behavioral expectations associated with the experience of illness, and the conditions under which these expectations become operative.

Mrs. Kades

#### 110A-110B-110C. Clinical Nursing. (1½ courses each)

Lecture, two hours; laboratory, 16 hours. Prerequisites: courses 101A-101B, 104A-104B, 105, Medical Science 101A-101B, and Psychology 112 or its equivalent. Study of theories and their application in the nursing care of adults and children, including consideration of family and community health. Laboratory problems and practice in hospital and community settings.

Mrs. Bell

#### \*155. Changing Perspectives in the Nursing Profession.

Lecture, four hours. Prerequisite: senior standing. A critical examination of the current situation in nursing and the changing perspectives in the health

\* Not to be given, 1970-1971.

fields. Discussion is directed toward helping the student develop a philosophy and focus for leadership consistent with today's world.

### 175. Nursing Care of Children in Schools. (1½ courses)

Lecture, two hours; laboratory, 12 to 16 hours. Prerequisites: consent of the instructor. Study of the theory involved in the planning, organization, implementation and evaluation of nursing services in public schools. Laboratory problems and practices in public school systems. Mrs. Branch

### 185. Study of the Nursing Profession.

Lecture, four hours. Prerequisite: concurrent with course 195. A study of the institutional, associational and societal aspects of professional nursing practice with emphasis on the rights and obligations of professional status within nursing, between professions and in relation to the community. Miss Cahill

### 190. The Interpersonal Process in Nursing.

Lecture, two to four hours. Prerequisites: consent of the instructor. Study of theoretical and practical problems in human relationships. Focus on the nature of two person nurse-patient interaction and the implications for improved communication and its effect on nursing care. Miss Dambacher

### \*191. Group Process and Interaction in Nursing.

Lecture, three hours; small group experience, one and one-half hours. Prerequisites: consent of the instructor. Study of the structure of small groups in which nurses function, i.e., institutional, professional, community, etc. Consideration of task and maintenance functions as phenomena in group life. Analysis of cognitive, methodological, emotional and goal systems, power, role, communications and norms in groups pertinent to nursing.

### 192. Health Care Organizations as Small Societies.

Lecture and discussion, four hours. Prerequisites: consent of the instructor. A study of the large scale interaction systems within which nursing is practiced. Content is focused on the role and function of nursing at the interprofessional and professional-societal levels of analysis. Miss Cahill

### 195. Nursing Care Practices and Staffing Patterns. (2 courses)

Lecture, three hours; laboratory to be arranged. Prerequisites: courses 101A-101B, 104A-104B-104C, 102A-102B-102C. Analysis and synthesis of systems of administering nursing care programs including evaluation and prediction of success. Participation in administering nursing services. Mrs. Auger and Staff

### 196. Health Care Problems of Minority Group Members.

Prerequisite: Sociology 1A or 101. Description and discussion of the special health care problems which members of minority groups face. These problems may be related to socio-economic status as well as ethnic background and subcultural differences. Mrs. Bullough

### 198. Special Courses in Nursing. (1 to 2 courses)

Lecture, two to four hours; laboratory none to eight hours. Prerequisites: admission to School of Nursing and consent of the instructor. Not offered for students who have credit for courses 105, 110A-110B-110C, or who are eligible for 200 nursing level courses. Study of modern concepts, recent

advances and specific problems in the field. Nursing laboratory in hospitals and community agencies may be required in certain sections. Miss Muecke

### 199. Special Studies in Nursing. (½ to 1 course)

Lecture, to be arranged. Prerequisites: senior standing or consent of the instructor. Individual study of a problem in the field of nursing. Mrs. Auger, Miss Muecke

#### Graduate Courses

### 203. Theoretical Framework of Nursing Practice.

Comparative study of selected conceptual models of nursing and the recipient of nursing, with particular emphasis on the regulatory model, the adaptation model, the supplementary model, and the complementary model. Miss Johnson

### 205A-205B. Research in Nursing.

Prerequisite: course 203 and upper division statistics. An examination of processes for exploration, experimentation, and validation of knowledge in nursing. Particular emphasis will be given to the treatment of problems of inquiry in a clinical setting. Miss Vredevoe

### 210. Developmental Theory and Problems.

Prerequisites: three approved coordinated basic science courses. A critical analysis of the problems of deprivation, distortion, and overload arising from disturbances in sensory input or through constraints in man-man interactions. The focus will be on clinical nursing problems of both a conceptual and practical nature. Miss Cahill

### 212. Man-Environment Interactions.

Lecture, two hours. Prerequisite: three approved coordinated basic science courses. Study of physical and social influences on patient behavior, with particular emphasis on sensory deprivation and social isolation. Miss Johnson

### 214. The Self and the Social Situation in Patient Behavior.

Prerequisite: three approved coordinated basic science courses. Examination of psychological influences and social processes in patient behavior characterized by social withdrawal and estrangement from the self and society. Miss Dambacher

### 216. Pathophysiological Changes and Patient Behavior.

Prerequisite: three approved coordinated basic science courses. Study of problems in somatic stability and instability as these are influenced by medical pathology and psychosocial processes and interaction. Mrs. Auger

### 234. Group Behavior in Health Care Institutions.

Prerequisite: three approved coordinated basic science courses. Focuses on the problems of social control, legitimization of authority, and processes of decision making in relation to organized social life in the complex settings in which nursing is practiced. The Staff

### 250. Seminar: Nursing in Other Cultures.

Prerequisite: consent of instructor. Discussion of anthropological principles which affect nursing care in a particular cultural environment. Individual research projects based upon the medical problems found in such an environment and the projected nursing interventions relative to these findings. Miss Brink

\* Not to be given, 1970-1971.

## Professional Courses

**370. Supervised Teaching of Nursing.**  
(1 to 2 courses)

Prerequisite: course 430B. Critical appraisal of the content of courses offered in collegiate nursing programs. Supervised teaching experience in the student's major field of nursing. Miss Uprichard

**401. Nursing Assessment and Intervention.**

Prerequisite: course 203 or concurrent. Instruction and experience in the systematic assessment of patients for the identification of nursing problems. Discussion and evaluation of major modes of inter-ventive practice. Mrs. Moidel

**410. Selected Problems in Nursing Care.**

Prerequisite: course 401 or consent of instructor. May be repeated by enrollment in a different section. Section 1. Problems in Environmental Management. Mrs. McCaffery

Section 2. Management of Developmental Problems. Miss Cahill, Miss Putnam

Section 3. Problems in Patient Motivation. Mrs. Dambacher

Section 4. Nursing Problems Related to Medical Pathology. Mrs. Anger

**420. Supervised Practice in Nursing Care.**

Prerequisites: courses 401, 410. Application of newly acquired knowledge and technology in nursing practice. Supervised practice in the clinical area of the student's choice. May be repeated for credit. Miss Arndt and the Staff

**425. Human Relations in Administration.**

(Formerly numbered 225.) A systematic study of the principles of human relations in administration, with emphasis upon their application to the field of nursing. Mr. Ferguson

**430A-430B. Educational Programs in Nursing.**

(Formerly numbered 230.)

430A. A critical appraisal of patterns of nursing education as considered from the standpoint of the changing social order. Focuses on philosophy and objectives, social origins, and relationships.

430B. A systematic study of the nature of the relationship between theories of learning, the selection and organization of learning experiences, and the evaluative process. Miss Uprichard

**\*432. Current Concepts in Community College Nursing Programs.**

(Formerly numbered 332.) Prerequisite: course 430A. A study of theoretical and practical problems in associate degree programs in nursing. Individual and group study and field work.

**434. Nursing Administration.**

(Formerly numbered 252A-252B and 254.) Prerequisites: courses 401, 410, 420, 425. A study of administrative theories and their relationships to effective administration in nursing service and nursing education. Critical analysis of the role of the administrator. Miss Arndt

\* Not to be given, 1970-1971.

**\*435. Internship in Nursing School Administration.**  
(2 courses)

(Formerly numbered 454.) Prerequisite: post-masters and course 434. The internship in Nursing School Administration is organized to provide experience in administering either a junior college or a baccalaureate program in nursing. May be repeated for credit.

**436. Internship in Nursing Service Administration.**  
(2 courses)

Prerequisites: post-masters and course 434. Directed learning in nursing service organizations with critical appraisal of the applicability of administrative theories. May be repeated for credit. Miss Arndt

**470. Clinical Nursing Specialization. (2 courses)**

Prerequisites: courses 401, 410 and 420. The refinement and extension of professional knowledge and skills in a clinical field of the student's choice. May be repeated for credit. Mrs. Moidel and the Staff

**475. Supervision of Nursing Services.**  
(1 to 2 courses)

Prerequisites: course 434. Critical appraisal of supervisory theory and process. Guided experience in supervision in hospitals or health agencies. Miss Arndt and Miss O'Leary

**476A. Community Mental Health Nursing.**

Prerequisites: courses 401, 410, 420 and 470. Theories of the consultation process concomitant with direct nursing consultation activities with caregiving individuals, groups and administrative personnel in community mental settings. Mrs. Gebbie, Mrs. Neuman, Mrs. Wiest

**476B. Community Mental Health Nursing.**

Prerequisites: courses 401, 410, 420 and 470. Community Mental Health theory and conceptual frameworks applied to experiences within community mental health settings. Emphasis upon the application of theory in community mental health programs through observation, participation, and intervention in areas of prevention, organization and planning. Mrs. Gebbie, Mrs. Neuman, Mrs. Wiest

## Individual Study and Research

**596. Directed Individual Studies for Graduate Students. (1 to 2 courses)**

(Formerly numbered 297.) Opportunity for graduate students in nursing to pursue special research interests. One quarter course (4 units) may be applied toward departmental minimum one time only. The Staff

**597. Individual Study for Master's Comprehensive Examination. (1 to 2 courses)**

One quarter course only may be applied toward departmental minimum requirement for the Master of Nursing. The Staff

**598. Research for Thesis. (1 to 2 courses)**

(Formerly numbered 299.) Prerequisite: one quarter in research; thesis approved. One quarter course (4 units) may be applied toward departmental minimum one time only. The Staff



## ORIENTAL LANGUAGES

(Department Office, 399 Social Welfare Building)

- Fr. Heinrich Busch, Ph.D., *Professor of Oriental Languages in Residence.*  
 Fr. Eugen Feifel, Ph.D., *Professor of Oriental Languages in Residence.*  
 Kan Lao, B.A., Academician, *Professor of Oriental Languages.*  
 Richard C. Rudolph, Ph.D., *Professor of Oriental Languages.*  
 Fr. Gerhard Schreiber, Ph.D., *Professor of Oriental Languages in Residence.*  
 Ensho Ashikaga, M.Litt., Giko, *Associate Professor of Oriental Languages (Chairman of the Department).*  
 Ben Befu, Ph.D., *Assistant Professor of Oriental Languages.*  
 Hung-Hsiang Chou, Ph.D., *Assistant Professor of Oriental Languages.*  
 Robert C. Epp, Ph.D., *Assistant Professor of Oriental Languages.*  
 Alicia O. Matsunaga, Ph.D., *Assistant Professor of Oriental Languages.*



- Y. C. Chu, M.A., *Lecturer in Chinese.*  
 Che-Hwei Lin, B.A., M.S. in L.S., *Lecturer in Japanese.*  
 Man-hing Mok, M.A., M.S., *Lecturer in Chinese.*  
 Kuo-yi Pao (Unensečen), M.A., M.S., *Lecturer in Oriental Languages.*  
 George Takahashi, M.A., *Lecturer in Japanese.*  
 Shirleen S. Wong, M.A., *Acting Assistant Professor of Oriental Languages.*

The Bachelor of Arts Degree in Oriental Languages is offered with a major either in Chinese or Japanese. The program is designed to provide familiarity with the culture and history of the Far East and a more specialized knowledge of the language and literature of the area of major interest.

No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

### Preparation for the Major

For the major in Chinese, courses 1A-1B-1C, 9A-9B-9C, 13A-13B, and 40A; also History 9B and 9C. For the major in Japanese, courses 1A-1B-1C, 9A-9B-9C, and 40B; also History 9B and 9C. Recommended for both majors: Anthropology 5C and 22.

### The Major

Required for the major in Chinese: 140A or 140B, 199 (at least ½ course), Art 114B and either History 191A, 191B, or 191C; also, nine upper division quarter courses chosen from 101A, 101B, 101C, 113A, 113B, 121A, 121B, 121C, 122, 124A, 124B, 139, 152, 163A, 163B, 163C.

Required for the major in Japanese: 141A or 141B, 199 (at least ½ course), Art 114C and either History 195A or 195B; also nine upper division quarter courses chosen from 109A, 109B, 109C, 119A, 119B, 119C, 129,

134, 137, 139, 142A, 142B, 153, 179A, 179B.

In the event Art 114B or 114C is not offered, substitutions may be made as follows: course 170A, 170B or 170C for 114B, course 172B for 114C.

*Recommended for Chinese majors:* course 13C.

*Recommended for both majors:* Anthropology 112, 114, Geography 186. Those planning to undertake graduate study are urged to include in their undergraduate program five quarters of French or German (see also p. 155), three courses in classical Chinese or Japanese at the upper division level, and course 195 or 196.

### Requirements for Admission to Graduate Study

Students seeking admission in graduate status in Oriental Languages are expected to meet, in addition to the general University requirements, not only the minimum requirements for the undergraduate major but in addition a minimum of three courses in classical Chinese or Japanese at the upper division level and course 195 or 196. Although students whose undergraduate preparation was not in the field of Oriental Languages will be admitted, such students will be required to meet the departmental standards in linguistic competence and course requirements prior to undertaking advanced work. Selection will be based on 1) prior scholastic performance (at the junior, senior and/or graduate levels),

2) recommendations by professors and others, 3) score on the Graduate Record Examination (aptitude test), and 4) degree of commitment to the field of study. Undergraduate education in China or Japan for a native of that country will not of itself be deemed sufficient commitment. Foreign students are reminded that a high degree of proficiency in English will be required for successful study in this department. Foreign students may be required to take English 106J (Advanced Composition for Foreign Students) and 109J (Introduction to Literature) beyond the minimum University requirements in English. Evaluation of the student's total performance during his first year will determine whether he will be permitted to continue his studies.

#### Requirements for the M.A. Degree

1. For general requirements, see pages 153-154.

2. Demonstrate a reading knowledge of French or German by passing the Graduate School Foreign Language Test administered by Educational Testing Service, or by successful completion of a course of at least level 5 (with a grade of C or better). Students are urged to meet their requirements by the end of the second quarter of graduate study.

3. Complete at least five graduate courses and the requisite number of upper division courses within the department to make a total of nine courses.

4. Comprehensive Plan: A student who expects to terminate his studies with attainment of an M.A. will take comprehensive examinations in the culture, history and literature of either China or Japan. If the results of these examinations show promise and the student is encouraged to continue his studies toward the Ph.D., he will submit a brief research paper showing the results of an original investigation of an appropriate problem.

Thesis Plan: Students who plan to proceed toward the Ph.D. will prepare a thesis showing the results of independent scholarship.

In either case, the quality of the research paper or the thesis will determine admittance to the doctoral program.

#### Requirements for the Ph.D. Degree

1. For general requirements, see page 156.

2. Requirements for the Master's degree in the department or its equivalent must be met for admission to the program (see Requirements for the M.A. Degree). A student admitted with an M.A. degree or advanced graduate standing from another institution

will not automatically be exempted from any part of our graduate program. At the very least, he will be required to submit a brief research paper showing his ability to conduct original research and his aptitude in communicating his findings.

3. Demonstrate a reading knowledge of French and German (whichever was not offered for the M.A. degree) by passing (minimum score: 500) the Graduate School Foreign Language Test administered by the Educational Testing Service, or by successful completion of a level 5 course (with a grade of C or better). This requirement must be met prior to advancement to candidacy.

4. All students will have completed a minimum of four courses in classical Chinese or classical Japanese at the upper division level and four more at the graduate level.

5. Chinese majors will present evidence of successful completion of three courses in modern Japanese at the intermediate level (109A-109B-109C) or higher; Japanese majors will present evidence of successful completion of three courses in classical Chinese (13A-13B-13C or higher). With the approval of the graduate adviser, this requirement may be met by presenting three courses in an Oriental language other than Japanese or Chinese (i.e., Mongolian, Sanskrit, or Tibetan).

6. Present a minor chosen from the following five fields: Buddhism, Chinese Archaeology, Linguistics, Chinese Language and Literature, and Japanese Language and Literature. Three courses at the upper division level followed by two graduate courses will constitute a minor.

7. Complete a minimum of five graduate courses in the department beyond the M.A. degree.

8. The candidate may concentrate in Chinese language and literature, Chinese archaeology, Japanese language and literature, Buddhism, or in a combination of any of these fields. Those specializing in Chinese Archaeology will be required to have completed courses 170A-170B-170C, 188A-188B and Anthropology 130A-130B (Origins of Old World Civilization) or Indo-European Studies 132 (European Archaeology: The Bronze Age). Recommended courses: Anthropology 133A (Ancient Civilizations of Western Middle America—Nahuatl Sphere), 133B (Ancient Civilizations of Eastern Middle America—Maya Sphere). Students specializing in Buddhism will be required to have completed courses 139, 164A-164B, 168,

172A-172B, Indo-European Studies 160 and 161 (Sanskrit). Recommended for those specializing in Chinese or Japanese language and literature: Linguistics 103 (Introduction to General Phonetics), 120 (Linguistic Analysis) and 225P (Linguistic Structures—Chinese) or 225H (Linguistic Structures—Japanese), English 110 (Introduction to Poetry), 140 (Criticism), and 201 (The Functions of Literary Criticism).

9. Complete written qualifying examinations in the major field, the minor field and in Far Eastern history and culture. Chinese or Japanese language and literature must be presented as a major in any program.

10. Pass an oral qualifying examination on the proposed dissertation topic and in appropriate related areas of study.

11. Present a dissertation embodying the results of independent investigation.

12. Pass a final oral examination which deals primarily with the relation of the dissertation to the field of knowledge to which it contributes.

#### Lower Division Courses

##### 1A-1B-1C. Elementary Modern Chinese.

Lecture, five hours. Not open to students with previous training. An introduction to the standard or "National Language" or *Kuoyü*. Conversational drill to be based on material covered in class.

Mr. Chu in charge

##### 3. Intensive Elementary Modern Chinese.

Fifteen hours weekly. Not open to students with previous training. An introduction to the "National Language" or *Kuoyü*. Weekly conversation drill to be based on material covered in class. Equivalent to course 1A-1B-1C combined. Normally to be offered in Summer Quarter only.

The Staff

##### 9A-9B-9C. Elementary Modern Japanese.

Prerequisite: not open to students with previous training. Introduction to modern Japanese with attention to conversation, grammar and the written forms. Conversation drill to be based on material covered in class.

Mr. Takahashi

##### 11. Intensive Elementary Modern Japanese.

Fifteen hours weekly. Prerequisite: not open to students with previous training. Introduction to modern Japanese with attention to conversation, grammar and the written form. Conversation drill to be based on material covered in class. Equivalent to course 9A-9B-9C combined. Normally to be offered in Summer Quarter only.

The Staff

##### 13A-13B-13C. Introduction to Classical Chinese.

Lecture, three hours; reading or discussion, one hour. Prerequisite: course 1A or consent of the instructor. Study of the development of the writing system and introduction to literary Chinese.

Mr. Chou, Mr. Pao

##### 40A-40B. History of Far Eastern Civilization.

Lecture, three hours; reading or discussion, one hour. (A) A survey of the development of the out-

standing aspects of Chinese culture from prehistoric to modern times. No knowledge of Chinese required. (B) A survey of the development of Japanese culture and its relationship to the Asiatic mainland. No knowledge of Japanese required.

Mrs. Matsumaga, Mr. Pao

#### Upper Division Courses

##### 101A-101B-101C. Intermediate Chinese.

Lecture, three hours; laboratory, one hour. A continuation of 1A-1B-1C. Weekly conversation drill to be based on material covered in class.

Mr. Chu, Miss Wong

##### 109A-109B-109C. Intermediate Modern Japanese.

Lecture, three hours; laboratory, one hour. A continuation of 9A-9B-9C. Weekly conversation drill to be based on material covered in class.

Mr. Epp, Mrs. Matsumaga, Mr. Takahashi

##### 113A-113B. Intermediate Classical Chinese.

Lecture, three hours; reading or discussion, one hour. Prerequisite: courses 13A-13B. Further readings in the classics.

Mr. Chou, Mr. Lao

##### 119A-119B. Advanced Modern Japanese.

Lecture, three hours; laboratory, one hour. A continuation of 109A-109B-109C. Weekly conversation drill to be based on material covered in class.

Mr. Takahashi

##### 119C. Advanced Conversational Japanese.

Prerequisite: course 109C or consent of the instructor. Not open to native speakers of Japanese. Advanced modern Japanese with emphasis on the spoken language for majoring students.

The Staff

##### 121A-121B. Advanced Chinese.

Lecture, three hours; laboratory, one hour. A continuation of 101A-101B-101C, with practice in newspaper style. Weekly conversation drill to be based on material covered in class.

Mr. Chu

##### 121C. Advanced Conversational Chinese.

Prerequisite: course 101C or consent of the instructor. Not open to native speakers of Chinese. Advanced modern Chinese with emphasis on the spoken language for majoring students.

The Staff

##### 122. Readings in Modern Chinese Literature.

Lecture, four hours. Prerequisite: course 121B or consent of the instructor. Readings and discussion of masterpieces of modern poetry, drama, and fiction.

Mr. Chou, Miss Wong

##### 124A-124B. Readings in Modern Expository Chinese.

Lecture, three hours. Prerequisite: course 121B or consent of the instructor. Readings in the social sciences, including Chinese Communist materials.

Mr. Chou, Mr. Chu

##### 129. Introduction to Classical Japanese.

(Formerly numbered 129A.) Lecture, three hours. Prerequisite: course 119B. Introduction to literary Japanese, with readings and discussions in the prose and poetry of the Heian Period.

Mr. Befa

##### 134. Readings in Contemporary Japanese Literature.

Lecture, three hours. Prerequisite: course 109C. Readings in contemporary novels, short stories and literary essays.

Mr. Epp

**137. Introduction to Kambun and Other Literary Styles.**

(Formerly numbered 129B.) Lecture, three hours. Introduction to Kambun, the Japanese literary rendering of Classical Chinese and Sorobun, the epistolary style. Mr. Befe

**139. Introduction to Buddhist Texts.**

Lecture, three hours. Prerequisite: course 13C, 121A or 119A. Studies on Buddhist terminology. Mr. Ashikaga

**140A-140B. Chinese Literature in Translation.**

(Formerly numbered 140B.) No knowledge of Chinese required. Lectures and collateral reading of representative works in English translation. (A) Poetry from earliest times to the present. (B) Drama and fiction from the 13th century to the 20th century. Miss Wong

**141A-141B. Japanese Literature in Translation.**

(Formerly numbered 140A.) No knowledge of Japanese required. A survey of Japanese literature from the beginning to modern times, emphasizing Chinese, Buddhist and Western influences. Mr. Befe

**142A-142B. Readings in Modern Expository Japanese.**

(Formerly numbered 143A-143B.) Lecture, three hours. Prerequisite: course 119B. (A) Japanese history and social sciences. (B) Japanese studies on Modern China; descriptive and interpretative. Mr. Epp, Mr. Takahashi

**152. Chinese Poetry.**

(Formerly numbered 152A.) Lecture, three hours. Prerequisite: course 113B. Readings and discussion of masterpieces of classical poetry. Miss Wong

**153. Modern Japanese Fiction.**

(Formerly numbered 152B.) Lecture, three hours. Prerequisite: course 119B. Advanced reading and discussion of novels and short stories, primarily of the Meiji and Taishō periods. Mr. Epp

**163A-163B-163C. Readings in Chinese Literary Texts.**

(Formerly numbered 163A-163B.) Lecture, three hours. Prerequisite: course 113B. (A and B) Literary texts. (C) Historical texts. Mr. Chou, Mr. Lao

**164A-164B. Tibetan.**

Lecture, three hours; reading or discussion, one hour. Mr. Ashikaga

**168. Introduction to Buddhist Thought.**

(Formerly numbered 172A.) No language requirement. Fundamental concepts of Indian Buddhism beginning with the period of the historical Buddha and proceeding through the early developments of Mahayana. Mrs. Matsunaga

**170A-170B-170C. Archaeology in Early and Modern China.**

170A. Introduction to Chinese archaeology: types of artifacts, monumental remains, bronze inscriptions. Early Chinese study of their own past: development of antiquarianism, earliest interpretation of archaeological data; Sung dynasty museums, classification and illustrated catalogs. Types of Chinese archaeological literature and early field work up to 1900.

170B. The beginnings of scientific archaeology in China. Excavations of prehistoric Shang and Chou sites and the foundation of modern archaeology by the Nationalist government.

170C. Survey of major excavations of sites of all periods carried out under the intensive archaeological program of the Communist regime. Mr. Chou, Mr. Rudolph

**172A-172B. The Influence of Buddhism on Far Eastern Cultures and on Western Thought.**

(Formerly numbered 172B-172C.) No language requirement. The historical development of Buddhism in China, Tibet, and Japan and its influence on the culture and society of these areas to the West. Mr. Ashikaga, Mrs. Matsunaga

**174. Readings in Mongolian.**

Mr. Pao

**175A. The Structure of the Chinese Language.**

Lecture, three hours; reading or discussion, one hour. Prerequisite: consent of the instructor. Phonology, morphology, and syntax of Chinese. The Staff

**175B. The Structure of the Japanese Language.**

Lecture, three hours; reading or discussion, one hour. Prerequisite: consent of the instructor. Phonology, morphology and syntax of Japanese. Mr. Takahashi

**177. Readings in Tibetan.**

Prerequisites: courses 164A-164B. Mr. Ashikaga

**179A. Readings in Medieval Japanese Literature.**

Lecture, three hours. Prerequisite: course 129 or consent of the instructor. Readings and discussion in the prose, poetry and drama up till 1600. Mr. Befe

**179B. Readings in Edo Literature.**

Lecture, three hours. Prerequisite: course 129. Readings and discussion in the prose, poetry and drama from 1600 to 1868. Mr. Befe

**188A-188B. Chinese Paleography.**

(Formerly numbered 196.) Prerequisite: an advanced reading knowledge of classical Chinese. (A) Introduction to the earliest known Chinese writing that is found on the oracle bones, and information derived from source. (B) The decipherment and interpretation of ancient texts and the development of the Chinese script, starting with the Chou dynasty. Mr. Chou, Mr. Lao

**195. Chinese Bibliography.**

Prerequisite: reading knowledge of Chinese and consent of the instructor. Mrs. Mok

**196. Japanese Bibliography.**

Prerequisite: reading knowledge of Japanese and consent of the instructor. Mr. Liu

**199. Special Studies in Oriental Languages.**

(1/2 to 1 course)

Prerequisite: senior standing in the Department or advanced reading knowledge of Chinese or Japanese, and consent of the instructor. Special individual study. The Staff

**Graduate Courses****203A-203B. Chinese Philosophical Texts.** Mr. Leo**213A-213B. Chinese Buddhist Texts.** Fr. Busch

**223. History of the Japanese Language.** The Staff

**226. Problems in Techniques of Translation.**

Introduction to theoretical works on translation, practice in rendering specific passages from the Japanese into appropriate English, stress on works in thought and social sciences, and discussion of difficulties encountered. Mr. Epp

**229A-229B. Japanese Buddhist Texts.**

Mrs. Matsunaga

**240. Chinese Classics.**

Prose and poetry in the Classical Style.

Miss Wong

**242A-242B. Japanese Classics.**

242A. Prose and poetry up to 1600.

242B. Prose and poetry from 1600 to 1868.

Mr. Befu

**245. Modern Japanese Literature.**

Mr. Epp

**251. Seminar: Selected Topics in Chinese Literature.**

May be repeated for credit.

The Staff

**252. Seminar: Selected Topics in Japanese Literature.**

May be repeated for credit.

Mr. Befu

**253A-253B. Seminar in Buddhist Studies.**

Mr. Ashikaga

**262. Seminar in Sineological Literature.**

Fr. Feifel

**270. Seminar: Selected Topics in Chinese Archaeology.**

(Formerly numbered 270A-270B.) May be repeated for credit.

Mr. Rudolph

**275. Seminar: Selected Topics in Chinese Cultural History.**

May be repeated for credit.

Mr. Rudolph

**285. Problems in Buddhist Culture.**

Mr. Ashikaga

**295. Bibliography and Methods of Research in Chinese.**

Fr. Schreiber

**296. Bibliography and Methods of Research in Japanese.**

The Staff

Professional Courses

**301. Methods of Teaching Chinese as a Second Language.**

The Staff

**309. Methods of Teaching Japanese as a Second Language.**

The Staff

Individual Study and Research

All of these courses will be graded Satisfactory/Unsatisfactory. A student may enroll in 596 and 598 two times and in 597 and 599 three times, but only one of these may apply toward the minimum course requirement.

**596. Directed Individual Studies.**  
(1 to 2 courses)

The Staff

**597. Preparation for Comprehensive or Qualifying Examinations.**

The Staff

**598. Master's Level Research.**

The Staff

**599. Doctoral Research. (1 to 2 courses)**

The Staff

Related Courses in Other Departments

**Art 114A. Indian Art.**

114B. Chinese Art.

114C. Japanese Art.

115A. Advanced Indian Art.

115B. Advanced Chinese Art.

116. Buddhist Art in Asia.

260. Asian Art.

**Geography. 186. Eastern Asia.**  
285. Asia.

**History. 124A-124B. History of Religions.**

191A-191B-191C. History of China.

193. Diplomatic History of the Far East.

195A-195B. Tokugawa and Modern Japan.

196. Early History of India.

212. Intellectual History of Recent China.

214. Social and Intellectual History of Recent Japan.

230. Advanced Historiography: L. China.

M. Japan. P. History of Religions.

240. Topics in History: L. China. M. Japan. P. History of Religions.

279A-279B. Seminar in Chinese History.

281A-281B. Seminar in Modern Japanese History.

**Linguistics. 220. Linguistic Areas: H. Far East.**

225. Linguistic Structures. H. Japanese. P. Chinese.

**Music. 171. Ethnomusicology Performance Organization: C. Music of China. G Music and Dance of Japan.**

**Political Science. 135. International Relations of East Asia.**

159. Chinese Government and Politics.

160. Japanese Government and Politics.

250. Seminars in Regional and Area Political Studies: C. Chinese and East Asian Studies. D. Japanese and Western Pacific Studies.

## ■ PATHOLOGY

(Department Office, 13-267 Center for the Health Sciences).

W. Jann Brown, M.D., *Professor of Pathology (Acting Chairman)*.

William H. Carnes, M.D., *Professor of Pathology*.

Baldwin G. Lamson, M.D., *Professor of Pathology and Director of Hospital and Clinics*.

Harrison Latta, M.D., *Professor of Pathology*.

Sidney C. Madden, M.D., *Professor of Pathology*.

Roy L. Walford, M.D., *Professor of Pathology*.

Louis J. Zeldis, M.D., *Professor of Pathology (Vice-Chairman of the Department)*.

Pasquale A. Cancilla, M.D., *Associate Professor of Pathology*.

Walter F. Coulson, M.D., *Associate Professor of Pathology*.

M. Anthony Verity, M.D., *Associate Professor of Pathology*.

John M. Andrews, M.D., *Assistant Professor of Pathology*.

Rosemary D. Bevan, M.D., *Assistant Professor of Pathology in Residence*.

Robert Y. Foos, M.D., *Assistant Professor of Pathology*.

Ruth Gussen, M.D., *Assistant Professor of Pathology*.

Gen Niwayama, M.D., *Assistant Professor of Pathology*.

Lydia Osvaldo-Decima, M.D., *Assistant Professor of Pathology*.

Donald E. Paglia, M.D., *Assistant Professor of Pathology in Residence*.

David D. Porter, M.D., *Assistant Professor of Pathology*.

George S. Smith, M.D., *Assistant Professor of Pathology*.

Thomas M. Stanley, M.D., *Assistant Professor of Pathology*.

Marrilyn J. Stein, M.D., *Acting Assistant Professor of Pathology*.

Jerry Waisman, M.D., *Assistant Professor of Pathology*.



Joseph Raymond, M.D., *Lecturer in Pathology and Head of Clinical Laboratories*.

Graduate study programs in the department are offered to a limited number of medical students between the second and third or between the third and fourth years. For further information consult the chairman of the Department. The following course is open to qualified nonmedical graduate students in so far as facilities permit.

### Graduate Courses

#### 231A. Pathological Anatomy and Physiology.

(2 courses)

Credit to be given only on completion of 231B. Prerequisite: graduate student status and completion of a curriculum satisfying basic requirements for

the study of human pathology. Candidates should make application to the Department of Pathology office. Limited to four students. Demonstrations, discussions, and individual study of a student loan collection of microscopic slide preparations of fresh specimens from recent autopsies, supplemented by fixed museum specimens, Kodachrome photomicrographs, and projection of microslides. The course of study includes general pathology and the special pathology of organ systems, emphasizing the correlation of abnormal anatomy with deranged physiology and chemistry. Laboratory exercises illustrative of major phenomena of disease are performed by students under staff supervision. The topic for the term paper should be selected in consultation with the instructor. The Staff

#### 231B. Pathological Anatomy and Physiology.

Continuation of course 231A.

## ■ PHARMACOLOGY

(Department Office, 23-263 Center for the Health Sciences)

John A. Bevan, B.Sc., M.B., B.S., *Professor of Pharmacology*.

Robert George, Ph.D., *Professor of Pharmacology*.

William L. Hewitt, M.D., *Professor of Medicine and Pharmacology*.

Donald J. Jenden, B.Sc., M.B., B.S., *Professor of Pharmacology and Biomathematics (Chairman of the Department)*.

Dermot B. Taylor, M.A., M.D., *Professor of Pharmacology.*  
 Wallace D. Winters, M.D., Ph.D., *Professor of Pharmacology in Residence.*  
 Peter Lomax, M.D., *Associate Professor of Pharmacology.*  
 J. Heward Thompson, M.B., B.Ch., B.A.O., *Associate Professor of Pharmacology.*  
 M. D. Fairchild, Ph.D., *Adjunct Assistant Professor of Pharmacology.*  
 Ronald Okun, M.D., *Adjunct Assistant Professor of Pharmacology.*  
 Che Su, Ph.D., *Assistant Adjunct Professor of Pharmacology.*



J. H. Beckerman, M.S., *Lecturer in Pharmacology.*  
 Sandra I. Lamb, Ph.D., *Lecturer in Pharmacology.*  
 Michael W. Whitehouse, Ph.D., *Acting Professor of Pharmacology.*

#### Admission to Graduate Status

In addition to meeting the requirements of the Graduate Division, the student must have received the bachelor's degree in a biological or physical science or in the pre-medical curriculum, provided that the following, or their equivalents, have been completed: 6 semester units of college mathematics, 8 units of physics, 16 units of chemistry (including quantitative analysis and organic chemistry), 8 units of zoology (including comparative gross and microscopic anatomy), 8 units of mammalian physiology (including laboratory), 10 units of biochemistry (including laboratory).

In suitable cases, students who have not completed the above requirements may be admitted to graduate status, but the deficiencies will have to be removed within a specified time.

Students may from time to time be required to pass such examinations as may be thought advisable by the staff of the Department.

#### Requirements for the Degree of Master of Science

In addition to the general requirements of the Graduate Division the student must complete the following: Pharmacology 201 (Mammalian Pharmacology and Toxicology); Pharmacology 231 (Introduction to Pharmacology); Pharmacology 232 (Fundamental Principles of Drug Action); Pharmacology 233 (Statistical Principles in Pharmacology); Pharmacology 234A-234B-234C (Experimental Methods in Pharmacology); Pharmacology 251A-251B-251C (Seminar); Pharmacology 261 (Introduction to Clinical Pharmacology); suitable additional courses in related subjects to make a total of 36 units; and a thesis.

The responsibility for completion of all technical requirements for the master's degree rests solely with the candidate. This includes application to the Graduate Division

for advancement to candidacy during the first two weeks of the final quarter in which the candidate hopes to qualify. The deadline for this application is set by the Graduate Division.

#### Requirements for the Doctor's Degree

*Advancement to Candidacy.* In addition to the general requirements of the Graduate Division, the student must pass a series of qualifying examinations both written and oral. His guidance committee may also stipulate additional requirements. This committee will be appointed by the Chairman of the Department.

*Departmental Requirements.* The minimum requirements in addition to those for the master's degree in pharmacology and toxicology are: Pharmacology 236 (Neuropharmacology); two quarters of physical chemistry; a course in calculus; such additional subjects as his guidance committee may designate.

The responsibility for completion of all technical requirements for the doctor's degree rests solely with the candidate.

#### Upper Division Course

##### 101. Elements of Pharmacology. (2 courses)

Lectures, laboratories, demonstrations and conferences. Prerequisite: enrollment in School of Dentistry or consent of the instructor. Required course for junior dental students. A general consideration of the modes of action and the pharmacological and toxicological effect of drugs with a more detailed study of those agents used in clinical dentistry and the principles governing their use.

Mr. Lomax in charge

#### Graduate Courses

##### 201. Mammalian Pharmacology and Toxicology. (2 courses)

Lectures, demonstrations, laboratories and conferences. Prerequisite: mammalian physiology. A detailed and comprehensive consideration of the classification, description, modes of action and the pharmacological and toxicological actions of drugs with special reference to the principles governing their use in medicine.

Mr. Jenden in charge

**231. Introduction to Pharmacology. (½ course)**

Prerequisite: consent of the instructor. Lectures, discussions and assigned reading on the scope of pharmacology and its relation to other sciences.

Mr. Jenden

**232. Fundamental Principles of Drug Action.**

Prerequisite: Inorganic, organic and physical chemistry. Advanced lectures on the scientific basis of pharmacological action. Interaction between drugs and cell components. Principles governing absorption, distribution, metabolism and excretion. Diffusion of drugs into and through tissues. Relationships between structure and action in relevant series of drugs.

Mr. Bevan, Mr. Taylor

**233. Statistical Principles in Pharmacology.**

(½ course)

The theory and practice of the application of statistical methods to the design of experiments and the analysis of data in pharmacology, toxicology and therapeutics.

Mr. Jenden in charge

**234A-234B-234C. Experimental Methods in Pharmacology. (½ course each)**

Prerequisite: consent of instructor. A survey of experimental methods and instrumentation used in the analysis, identification, and study of mechanisms of action of pharmacologically active compounds.

Mr. Su, Mr. George, Mrs. Lamb

**235. Systemic Mammalian Pharmacology and Toxicology. (2 courses)**

Prerequisite: mammalian physiology. A comprehensive lecture course in systemic general mammalian pharmacology including the classification, description and mode of action of pharmacological agents.

Mr. Jenden in charge

**236. Neuropharmacology.**

Prerequisite: neurophysiology. Advanced neuropharmacology, including actions and modes of ac-

tion of drugs acting on central nervous system, interactions between drugs and nervous tissue, movements of drugs through the blood brain barrier, and distribution to central nervous system, problems of central transmission.

Mr. George, Mr. Winters

**251A-251B-251C. Seminar in Pharmacology.**

(½ course each)

Mr. Thompson

**252. Seminar in Chemical Pharmacology. (½ course)**

Prerequisite: consent of the instructor. Oral reports and discussions of topics of current interest in the application of chemical concepts and techniques to pharmacology. May be taken for credit three times.

Mr. Whitehouse

**261. Introduction to Clinical Pharmacology.**

(½ course)

Prerequisite: consent of the instructor. Lectures, case presentations and discussions designed to acquaint graduate students with the special problems and effects encountered in clinical use of drugs, including absorption, metabolism and excretion, drug interactions and interference with clinical laboratory analysis.

Mr. Okun, Mr. Thompson

**291. Special Topics in Pharmacology. (½ course)**

Prerequisite: consent of instructor. Examination in depth of topics of current importance in pharmacology. Emphasis on recent contributions of special interest to advanced doctoral candidates, academic staff or visiting faculty. May be taken for credit three times.

The Staff

**Individual Study and Research****596. Directed Individual Research in Pharmacology.**

(1 to 3 courses)

The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (1 to 3 courses)**

The Staff

**■ PHILOSOPHY**

(Department Office, 321 Social Welfare Building)

Alonzo Church, Ph.D., *Professor of Philosophy and Mathematics in Residence.*

Donald Kalish, Ph.D., *Professor of Philosophy.*

Arnold S. Kaufman, Ph.D., *Professor of Philosophy.*

Richard Montague, Ph.D., *Professor of Philosophy.*

Herbert Morris, LL.B., D.Phil., *Professor of Philosophy and Law.*

J. Wesley Robson, Ph.D., *Professor of Philosophy.*

Richard A. Wasserstrom, LL.B., Ph.D., *Professor of Philosophy and Law.*

Robert M. Yost, Ph.D., *Professor of Philosophy.*

Rudolf Carnap, Ph.D., *Emeritus Professor of Philosophy.*

Hugh Miller, Ph.D., *Emeritus Professor of Philosophy.*

Ernest A. Moody, Ph.D., *Emeritus Professor of Philosophy.*

Montgomery Furth, Ph.D., *Associate Professor of Philosophy.*

David Kaplan, Ph.D., *Associate Professor of Philosophy.*

Thomas E. Hill, Jr., Ph.D., *Assistant Professor of Philosophy.*

David K. Lewis, Ph.D., *Assistant Professor of Philosophy.*

John R. Perry, Ph.D., *Assistant Professor of Philosophy.*

Sandra L. Peterson, B.Phil., Ph.D., *Assistant Professor of Philosophy.*



Warren S. Quinn, Ph.D., *Assistant Professor of Philosophy.*  
 C. Wade Savage, Ph.D., *Assistant Professor of Philosophy.*  
 Martin Tweedale, Ph.D., *Assistant Professor of Philosophy.*  
 ———, *Assistant Professor of Philosophy.*  
 ———, *Assistant Professor of Philosophy.*  
 ———, *Assistant Professor of Philosophy.*



John Bennett, B.A., *Acting Assistant Professor of Philosophy.*  
 Angela Y. Davis, M.A., *Acting Assistant Professor of Philosophy.*

#### Preparation for the Major\*

Four lower division philosophy courses (16 units), including course 31 and either courses 6 and 7 or courses 20 and 21.

#### The Major\*

Twelve upper division or graduate philosophy courses (48 units), including at least two courses (8 units) in any three of the following four groups, and one course (4 units) in the remaining group.

Upon the recommendation of the Philosophy Department faculty, honors in philosophy will be awarded at graduation to a major whose grade point average in upper division philosophy courses is 3.3 and who has completed two graduate courses (8 units) in philosophy with an average grade of 3.5.

Students intending to do graduate work in Philosophy should consult with the graduate adviser as well as with the undergraduate adviser.

#### Admission to Graduate Status

Students interested in admission to graduate study should write to the Graduate Adviser, Department of Philosophy for documents describing the graduate program.

An undergraduate major in Philosophy is not required, although some undergraduate preparation is expected.

#### Graduate Courses and Seminars

During the period between admission to graduate standing and advancement to candidacy a graduate student is normally required in each academic year of attendance to take at least two courses (8 units) in philosophy numbered in the 200 series.

#### First Year Graduate Program

During the Fall, Winter, and Spring Quarters of his first full academic year, each graduate student enrolls in Philosophy 250A-250B-250C. Students who have not taken Philosophy 31 and 32 do so during their first year. These courses serve as the core of the first year graduate program.

#### Second Year Examination

During the Fall of his second full year of graduate study, each student takes a written examination on the material covered in Philosophy 250A-250B-250C the preceding year, plus elementary logic as covered in Philosophy 31 and 32.

Candidates for the M.A. who are not admitted to the doctoral program may, if necessary, repeat the Second Year Examination at the end of the second year.

#### Admission to the Doctoral Program

Following a student's Second Year Examination, the faculty determines whether the student is to be admitted to the doctoral program. This decision is based on his performance in his first year courses, including Philosophy 250A-250B-250C, on his performance in the Second Year Examination, and on any other available evidence concerning his ability to complete the program successfully. (Passage of the Second Year Examination is neither necessary nor sufficient for admission to the doctoral program.) In exceptional circumstances the decision may be postponed for at most two quarters.

#### Requirements for the Master's Degree

*General Requirements.* See pages 153-154.

*Foreign Language.* A reading knowledge of one of the following languages: Greek, Latin, French, or German. On petition to the Department, another language relevant to the candidate's field of specialization may be chosen.

*Course Requirement.* At least nine courses (36 units) numbered over 100 (excluding 199), five courses (20 units) of which must be in philosophy courses numbered in the 200 series.

\* Students who enrolled as majors before the fall term of 1966 have the option of fulfilling slightly different requirements. See *UCLA General Catalog, 1966-1967.*

**First Year Program**

Satisfactory completion of Philosophy 250A-B-C, 31 and 32.

**Second Year Examination**

Passage of the Second Year Examination.†

**Requirements for the Candidate in Philosophy Degree**

The Candidate in Philosophy Degree (C. Phil.) is awarded upon a Ph.D. candidate's formal advancement to candidacy. A student is advanced to candidacy for the doctorate when he has completed all requirements for the Ph.D. except one of his two foreign languages, the dissertation, and the final examination. The Candidate in Philosophy is not a terminal degree. The Department will not recommend a student for advancement to candidacy and at the same time disqualify him for continued registration and further study or research on his dissertation. If a student withdraws from the University after advancement to candidacy and at award of the C.Phil., then the Department will readmit him upon application, provided the period of absence has not exceeded seven years. Any student, of course, may himself decide not to proceed beyond the C.Phil. Four quarters of academic residence three of which (normally the last three) must be spent in continuous residence at UCLA are required for the C.Phil.

**Requirements for the Doctor's Degree\***

*General Requirements.* See pages 156-160.

*Foreign Language.* A reading knowledge of two of the following languages: Greek, Latin, French, or German. On petition to the Department, one of these may be replaced by another language relevant to the candidate's field of specialization.

*Course Requirement. Logic.* Philosophy 134 and Philosophy 135, with grades of B or A.

*Course Requirement. History.* Four graduate level courses or seminars in History of Philosophy, with grades of B or A.

† In some cases, the Second Year Examination may be replaced by (1) an oral examination testing the student's general knowledge of philosophy, and (2) a thesis supervised and approved by a committee appointed by the Dean of the Graduate Division. Students interested in such an option should consult the Graduate Adviser.

\* Students notified of admission to the graduate program before October 1969 may elect to remain wholly or partly under the old requirements specified in the 1969-70 *General Catalog*. For details consult the Graduate Adviser.

*Proposition Requirement.* Five accepted propositions, distributed as follows: Two in Metaphysics and Epistemology, two in Value Theory, one in an area of the student's choice. A proposition is a substantial research paper which states a problem, reviews the pertinent history and contemporary literature, proposes a solution, and surveys difficulties to be anticipated in working out that solution.

*Oral Qualifying Examination.* An oral examination, administered by the doctoral committee appointed by the Dean of the Graduate Division. The examination covers the general field of philosophy in which the student's proposed dissertation falls, and any fields outside philosophy in which competence is required for successful completion of the dissertation.

*Dissertation.* A dissertation on a subject chosen by the candidate and approved by his doctoral committee and the Dean of the Graduate Division.

*Final Examination.* An oral examination in the field of the student's special interest as represented by his dissertation, administered by the doctoral committee.

**Lower Division Courses**

All lower division courses are introductory and without prerequisites except as otherwise stated.

**6. Introduction to Philosophy.**

Lectures, three hours; discussion section, one hour. Selected topics from the following: ethics, political philosophy, and philosophy of art.

Mr. Bennett, Mr. Yost

**7. Introduction to Philosophy.**

Course 6 is not a prerequisite. Lectures, three hours; discussion section, one hour. Selected topics from the following: metaphysics, theory of knowledge, philosophy of science, and philosophy of religion.

Mr. Quinn

**20. Ancient Philosophical Classics.**

Lectures, three hours; discussion section, one hour. Selected topics from the following: the beginnings of Western science and philosophy; the philosophies of Socrates, Plato, and Aristotle; Greek philosophies in the Roman world and in the Christian era.

Mr. Furth, Miss Peterson

**21. Modern Philosophical Classics.**

Course 20 is not a prerequisite. Lectures, three hours; discussion section, one hour. Selected topics from the following: the Renaissance and the rise of modern science; rationalism in Descartes, Spinoza, Leibniz; empiricism in Locke, Berkeley, Hume; philosophies of Kant and his successors; recent movements.

Mr. Perry, Mr. Tweedale

**31. Logic, First Course.**

Lectures, three hours; discussion section, one hour. Recommended for students who plan to pursue more advanced studies in logic. The elements of symbolic logic, sentential and quantificational; forms of reasoning and structure of language.

Mr. Church

**32. Logic, Second Course.**

Lectures, three hours; discussion section, one hour. Prerequisite: course 31, preferably in the preceding quarter. Symbolic logic: extension of the systematic development of course 31. Quantifiers, identity, definite descriptions. Mr. Montague

**99. Recurring Philosophical Themes in Black Literature.**

Lectures, three hours; discussion section, one hour. The purpose of this course is to survey and analyze the implicit ideas, whether systematic or individual, in the art, literature, music, religion, and language of Afro-Americans. Lectures cover historical origins of the marginal nature of Afro-American culture, and the social realities of various periods which provide the background for cultural expressions.

**Upper Division Courses**

Normally, prerequisite for all upper division courses is upper division standing and such special prerequisites as are mentioned in the course listings.

**GROUP I****101. Greek Philosophy: Plato and Precursors.**

Prerequisites: one course (4 units) in philosophy or consent of the instructor. A study of the pre-Socratic philosophers in relation to selected works of Plato. Miss Peterson

**102. Greek Philosophy: Aristotle and Later Greek Philosophy.**

Prerequisite: one course in philosophy or consent of the instructor. A study of the philosophical contributions of Aristotle, the Stoics, Epicureans, Sceptics, and late Platonists, based on the reading and discussion of major works of Aristotle and of selected sources from later Greek authors. Mr. Furth

**103. Medieval Philosophy from Augustine to Aquinas.**

Lecture, three hours. Prerequisite: one course in philosophy or consent of the instructor. The formation of western scholastic philosophy within the framework of Christian doctrine, and its assimilation and criticism of the Greek philosophical heritage by Aquinas and other thirteenth century theologians. Selected writings of authors from Augustine through Aquinas read in translation. Mr. Tweedale

**104. Late Medieval and Renaissance Philosophy.**

Prerequisite: one course in philosophy or consent of the instructor. Duns Scotus, Ockham, and the *via moderna* of the fourteenth century; Renaissance skepticism and humanism; and the philosophical background of the scientific revolution. Selected texts of the late scholastic and Renaissance philosophers. Mr. Tweedale

**105. Continental Rationalism.**

Prerequisite: one course in philosophy or consent of the instructor. The philosophies of Descartes, Spinoza, and Leibniz. Mr. Furth

**106. British Empiricism.**

Prerequisite: one course in philosophy or consent of the instructor. The philosophies of Locke, Berkeley, and Hume. Mr. Ferry

**107. Kant and Idealism.**

Prerequisite: one course in philosophy or consent of instructor. A study of Kant as the basis for later German idealism.

**108. Nineteenth Century Philosophy.**

Prerequisite: one course in philosophy or consent of the instructor. Selected topics in nineteenth century thought.

**110. Islamic Philosophy.**

Prerequisite: one course (4 units) in philosophy or consent of the instructor. The development of Muslim philosophy in its great age (from Kindi to Averroes, 850 to 1200), considered in connection with Muslim theology and mysticism.

**111. Topics in Islamic Philosophy.**

Prerequisite: consent of the instructor; course 110 recommended. Advanced study of selected issues in Islamic philosophy.

**GROUP II****125. Introduction to Modern Logic.**

Open to lower division students with consent of the instructor. A survey of elementary topics in sentential logic, axiomatic foundations of arithmetic, calculus of classes and relations, elementary theory of probability, modal logic.

**126A. Philosophy of Science.**

Prerequisite: course 32 or course 125. An analysis of explanation, confirmation, and theory in the sciences.

**126B. Philosophy of Science.**

Prerequisite: course 126A or consent of the instructor. Certain philosophical problems regarding the content of the sciences.

**126C. Philosophy of Science: Social Sciences.**

Prerequisite: any two courses in philosophy or consent of the instructor. A discussion of topics in the philosophy of social science; e.g., the methods of the social sciences in relation to the physical sciences; value—bias in social inquiry; concept formation; theory construction; explanation and prediction; the nature of social laws. Mr. Kaufman

**127A-127B. Philosophy of Language.**

Prerequisite: course 31 and either course 32 or course 125; or consent of the instructor. With the consent of the instructor, course 127B may be taken without course 127A. Semiotic; syntax, semantics, pragmatics. The semantical concept of truth, sense and denotation, synonymy and analyticity, modalities and tenses, indexical terms, semantical paradoxes. Indirect discourse, subjunctive conditionals. Mr. Montague

**128. Philosophy of Mathematics.**

Prerequisite: course 134 or Mathematics 112A-112B or consent of the instructor. Axiomatic and set-theoretical foundations of systems of numbers; natural numbers, integers, rationals, reals, complex numbers. Foundational approaches of Russell, Hilbert, and Brouwer. Mr. Montague

**129. Philosophy of Psychology.**

Prerequisites: one 4-unit course in Psychology and one 4-unit course in Philosophy. Selected philosophical issues arising from psychological theories of

thinking, learning, motivation, perception and measurement. The meaning and verification of such theories. The difference between philosophy and psychology.

### 133. Logic, Third Course.

Prerequisite: course 32, preferably in the preceding quarter. Symbolic logic: formal theories, definitions, selected applications.

### 134. Introduction to Set Theory.

Prerequisite: course 133 (which with the consent of the instructor may be taken concurrently), or upper division standing in mathematics and consent of the instructor. Introduction to axiomatic set theory: sets, natural numbers, relations, functions, cardinality, infinity. Mr. Montague

### 135. Introduction to Metamathematics.

Prerequisite: course 134 or consent of the instructor. Models, satisfaction, truth, definability; logical truth and logical consequence; consistency and completeness. Mr. Church

## GROUP III

### 150A-150B. Society and Morals.

Course 150A is not prerequisite to 150B. A critical study of principles and arguments advanced in discussion of current moral issues. Possible topics: Black Power, Vietnam War, civil disobedience, sexual morality, punishment versus therapy. Guest lecturers may be employed and discussion sections will be held. Mr. Hill, Mr. Kaufman

### 151. History of Ethics.

Prerequisite: two courses in philosophy or consent of the instructor. Selected classics in the history of ethics. Mr. Hill

### 152. Ethical Theory.

Prerequisites: two courses in philosophy or consent of the instructor. Fundamental concepts and theories of morals. Mr. Quinn

### 155. Social Philosophy.

Selected problems in the field of social philosophy.

### 156. Political Philosophy.

Prerequisites: two courses in philosophy or consent of the instructor. An analysis of basic concepts in political theory. Mr. Bennett, Mr. Hill

### 160. Philosophy of Art.

The aesthetic experience; form and expression; the functions of art; bases of art criticism. Mr. Bennett

### 161. Aesthetic Theory.

Prerequisite: one course in philosophy or consent of the instructor. Theories of art; theories of aesthetic value; philosophical problems of art criticism. Mr. Quinn

## GROUP IV

### 175. Philosophy of Religion.

The nature and existence of God; death and immortality; religious obligation and the question of free will; the systematic nature of theology and its relation to the philosophical enterprise.

### 176. Existentialism and Phenomenology.

A general introduction to basic concepts and methods.

### 178. Philosophy of History.

Selected problems in the philosophy of history.

### 180. Dialectical Materialism.

An analysis of the philosophical foundations and implications of dialectical materialism.

### 184. Metaphysics.

Prerequisite: two courses in philosophy or consent of the instructor. A study of selected metaphysical questions illustrating traditional approaches but stressing recent discussions. Questions will be selected from such topics as: metaphysical systems, causation, space and time, substance, qualities and relations, universals and particulars, identity, mind and body, free will, etc. Mr. Perry

### 186. Theory of Knowledge.

Prerequisite: two courses in philosophy. Philosophical problems concerning knowledge and belief. Possible topics: perception, certainty, memory, the analytic-synthetic distinction, self-knowledge, etc. Mr. Yost

### 188. Philosophy of Perception.

Prerequisite: two courses in philosophy or consent of the instructor. A critical study of the main philosophical theories of perception and the arguments used to establish them.

### 190. Philosophy of Mind.

Prerequisite: two courses in philosophy or consent of the instructor. An analysis of various problems concerning the nature of mind and mental phenomena, persons, knowledge of other minds, and behaviorism and its alternatives.

### 192. Philosophy of Language.

Prerequisite: two courses in philosophy or linguistics. Analysis of the concepts of meaning, reference, and truth in natural languages; syntactic and semantic descriptions of natural languages; theory of speech acts.

### 194. Contemporary Philosophy.

Prerequisite: two lower division courses in philosophy or one upper division course in philosophy or one course in logic or consent of the instructor. Analysis of the views of several recent philosophers.

## NO GROUP

### 199. Special Studies. (½ to 2 courses)

Prerequisite: consent of the instructor. This course can be used for the philosophy major but is not included in any of the four groups. The Staff

## Graduate Courses

### GROUP I

#### 201. Plato.

A study of the later dialogues. Miss Peterson

#### 202. Aristotle.

Prerequisite: undergraduate preparation in the history of Greek philosophy. Analysis of major problems in Aristotle's philosophy based on the reading, exposition and critical discussion of relevant texts in English translation. Mr. Furth

**203. Hobbes.**

Prerequisite: consent of the instructor. Hobbes' political philosophy, especially the Leviathan, with attention to its relevance to contemporary political philosophy. Mr. Bennett

**204. Hume.**

Prerequisite: consent of the instructor.

**205. Continental Rationalism.**

Prerequisite: consent of the instructor. Selected topics in the philosophy of Descartes, Spinoza, and Leibniz. Mr. Furth

**208. Kant.**

Prerequisite: consent of the instructor. A study of one of the three Critiques and supplementary works.

**209. Medieval Arabic Philosophers.**

Prerequisite: consent of the instructor.

**GROUP II****221A-221B-221C. Set Theory.**

(Formerly numbered 231A-231B and same as Mathematics 221A-221B-221C.) Prerequisite: Mathematics 112A or Philosophy 134 or consent of the instructor. Students may not receive credit for both Mathematics 221A-221B-221C and Philosophy 231A-221B-221C. Sets, relations, functions. Partial and total orderings; well-orderings. Ordinal and cardinal arithmetic, finiteness and infinity, the continuum hypothesis, inaccessible numbers. Formalization of set theory. Zermelo-Fraenkel Theory, von Neumann-Gödel Theory. Constructability. Results on relative consistency and independence.

**222. Gödel Theory.**

Prerequisite: course 135 or Mathematics 112A-112B or consent of the instructor. Elementary syntax: arithmetization of syntax; the Herbrand-Gentzen-Beth theorem. Theory of arithmetical theories: models, interpretability, self-reference, incompleteness, nondemonstrable consistency, modern development. Number-theoretically definable relations; specializations to recursive functions. Mr. Church

**223. Model Theory.**

Prerequisite: course 135 or Mathematics 112A-112B. Mr. Montague

**224. Philosophy of Physics.**

Prerequisite: consent of the instructor. Selected philosophical topics related to physical theory, depending on interests and background of the participants. Might include: space and time; observation in quantum mechanics; foundations of statistical mechanics.

**225. Probability and Inductive Logic.**

Prerequisite: course 134 or Mathematics 112A-112B or consent of the instructor.

**226. Topics in Mathematical Logic.**

Prerequisite: consent of the instructor. Content will vary from quarter to quarter. Mr. Church

**GROUP III****236. Topics in Political Philosophy.**

Prerequisites: course 150, 155, or 156; or any two courses in philosophy; or consent of the instructor.

An examination of one or more topics in political philosophy: e.g., justice, democracy, human rights, political obligation, alienation. Mr. Kaufman

**Graduate Seminars****250A-250B-250C. Seminar for First Year Graduate Students.**

Prerequisite: open to first year graduate students only. Selected topics in metaphysics and epistemology, history of philosophy, and ethics. Required for all first year graduate students. Mr. Furth

**GROUP I****251A. Seminar: History of Ancient Philosophy.**

Prerequisite: consent of the instructor. Selected problems and philosophers. Miss Peterson

**251B. Seminar: History of Medieval and Renaissance Philosophy.**

Prerequisite: consent of the instructor. Selected problems and philosophers. Mr. Tweedale

**251C. Seminar: History of Modern Philosophy.**

Prerequisite: consent of the instructor. Selected problems and philosophers. Mr. Furth

**GROUP II****260. Seminar: Mathematical Philosophy.**

Prerequisite: consent of the instructor.

**261. Seminar: Logic.**

Prerequisite: consent of the instructor. Mr. Church

**262A-262B. Seminar: Recursive Functions.**

Prerequisite: consent of the instructor.

**GROUP III****270. Seminar: History of Ethics.**

Prerequisite: consent of the instructor. Selected topics. Mr. Hill

**271. Seminar: Ethical Theory.**

Prerequisite: consent of the instructor. Selected topics. Content will vary from quarter to quarter. Mr. Hill

**272. Seminar: Political Theory.**

Prerequisite: consent of the instructor. Mr. Kaufman

**274. Seminar: Free Will and Morality.**

Prerequisite: consent of the instructor.

**275. Seminar: Responsibility in Law and Morals.**

Prerequisite: consent of the instructor. Mr. Morris, Mr. Wasserstrom

**276A. Legal Philosophy: The Nature of Law.**

Prerequisite: consent of the instructor. 276A is not a prerequisite to 276B. An inquiry into selected theories concerning the nature of law.

Mr. Morris, Mr. Wasserstrom

**276B. Legal Philosophy: The Nature of Justice.**

Prerequisite: consent of the instructor. An inquiry into selected topics relating to justice and the law. Mr. Morris, Mr. Wasserstrom

**277. Seminar: Aesthetic Theory.**

Prerequisite: consent of the instructor. Selected topics. Mr. Quinn

**GROUP IV**

**280. Seminar: Phenomenology.**

Prerequisite: consent of the instructor.

**282. Seminar: Metaphysics.**

Prerequisite: consent of the instructor.

**283. Seminar: Theory of Knowledge.**

Prerequisite: consent of the instructor.

**284. Seminar: Philosophy of Perception.**

Prerequisite: consent of the instructor. Mr. Yost

**287. Seminar: Philosophy of Language.**

Prerequisite: consent of the instructor. Mr. Montague, Miss Peterson

**288. Seminar: Wittgenstein.**

Prerequisite: consent of the instructor. Mr. Perry

Individual Study and Research

The courses in the 500 series do not apply toward the course requirement for the master's degree.

**596A-596B. Directed Individual Studies.**

(½ to 2 courses)

Any properly qualified graduate student who wishes to pursue a problem through reading or advanced study may do so if his proposed project is acceptable to a member of the staff. May be repeated for credit. Course 596A offered only on a graded basis; 596B only on a satisfactory/unsatisfactory basis. The Staff

**597. Preparation for Master's Comprehensive or Doctoral Qualifying Examinations.**

(½ to 2 courses)

Independent study in preparation for examination. May be repeated for credit. Graded only on a satisfactory/unsatisfactory basis. The Staff

**598A-598B. Research for Master's Thesis.**

(½ to 2 courses)

Prerequisite: passage of the oral qualifying examinations for the master's degree. May be repeated for credit. Course 598A offered only on a graded basis; 598B only on a satisfactory/unsatisfactory basis. The Staff

**599A-599B. Research for Doctoral Dissertation.**

(½ to 2 courses)

Prerequisite: advancement to candidacy for the doctoral degree. May be repeated for credit. Course 599A offered only on a graded basis; 599B only on a satisfactory/unsatisfactory basis. The Staff

**PHYSICAL EDUCATION**

(Department Office, 206 Men's Gymnasium, 124 Women's Gymnasium)

Camille Brown, Ed.D., *Professor of Physical Education.*

Bryant J. Cratty, Ed.D., *Professor of Physical Education.*

Valerie V. Hunt, Ed.D., *Professor of Physical Education.*

Ben W. Miller, Ph.D., *Professor of Physical Education.*

Norman P. Miller, Ed.D. *Professor of Physical Education.*

Laurence E. Morehouse, Ph.D., *Professor of Physical Education.*

Raymond A. Snyder, Ed.D., *Professor of Physical Education.*

Rosalind Cassidy, Ed.D., *Emeritus Professor of Physical Education.*

Carl H. Young, Ed.D., *Emeritus Professor of Physical Education.*

Serena Arnold, Ed.D., *Associate Professor of Physical Education.*

Glen Egstrom, Ph.D., *Associate Professor of Physical Education.*

Gerald W. Gardner, Ph.D., *Associate Professor of Physical Education.*

Donald T. Handy, Ed.D., *Associate Professor of Physical Education (Chairman of the Department).*

Jack F. Keogh, Ed.D., *Associate Professor of Physical Education (Vice-Chairman of the Department).*

Marjorie E. Latchaw, Ph.D., *Associate Professor of Physical Education.*

Wayne W. Massey, Ph.D., *Associate Professor of Physical Education.*

V. Reggie Edgerton, Ph.D., *Assistant Professor of Physical Education.*

Judith L. Smith, Ph.D., *Assistant Professor of Physical Education.*



Ethel T. Bell, Ed.D., *Supervisor of Physical Education.*

Norman D. Duncan, M.A., *Supervisor of Physical Education (Facility Manager).*

Briggs M. Hunt, B.E., *Supervisor of Physical Education.*

Joan L. Martin, M.S., *Supervisor of Physical Education.*

William F. Pillich, M.S., *Supervisor of Physical Education.*

Nanette T. McIntyre, M.S., *Associate Supervisor of Physical Education.*

Edith I. Hyde, M.A., *Emeritus Supervisor of Physical Education.*

Orsie M. Thomson, M.A., *Emeritus Supervisor of Physical Education.*

### **Bachelor's Degree in Physical Education**

Students of physical education pursue course work designed to develop and integrate concepts of human movement (kinesiology) and an allied field of inquiry, either physiology, psychology, or sociology. Selection of Plan I, II, or III in preparation for the major and in the major is contingent upon declaration of the allied field during the first year in the program. Subsequent transfer from one plan to another is permissible with the approval of an adviser. Some courses in allied and related fields satisfy a requirement in all three plans as well as one of the requirements of the College of Letters and Science. Students intending to major in physical education should confer with a departmental adviser before enrollment in classes.

All students are expected to demonstrate an acceptable level of performance in specified movement patterns through participation in proficiency-skills testing. Referral for instruction in appropriate activity areas will be made on the basis of individual test results. A departmental adviser in Women's Gym 124 must be consulted concerning course 2, proficiency-skills courses.

### **Preparation for the Major**

Courses 2, 10A, 10B; and one of the following groups of related and allied field courses.

Plan I. Allied Field, Physiology: Chemistry 1A, 1B, 1C; Biology 1A, 1B; Physical Sciences 1; Physical Education 15A, 15B. Recommended electives: Chemistry 4A, 4B, 4C; 6A, 6B, 6C; Mathematics through Calculus; Physical Education 15A, 15B.

Plan II. Allied Field, Psychology: Psychology 10, 12; Physical Education 15A, 15B; Physical Sciences 1, 2; Biology 2.

Plan III. Allied Field, Sociology: Sociology 1, 18, 19; Anthropology 5A, 5B; Physical Education 15A, 15B; Physical Sciences 1, 2; Biology 2.

### **The Major**

†Physical education courses—110A, 110B, 120, 148, and at least two (2) full courses from 112, 113, 114, 118, 119, 122, 136, 193,

199. One of the following groups of allied field courses.

Plan I. Allied Field, Physiology: a choice of four (4) physiological upper division courses in zoology approved by the departmental adviser.

Plan II. Allied Field, Psychology: Psychology 141 and six (6) upper division courses from two or three of the following areas: learning and learning disorders, physiological psychology, perception, personality and abnormal psychology, developmental psychology, social psychology, psychological measurement and evaluation. A minimum of one and a half courses must be taken in each of the areas selected.

Plan III. Allied Field, Sociology: four (4) upper division courses selected with the approval of the major adviser as follows: Two must be selected from Core Area I (Theory and Method), and two must be selected from either Core Area II (Social Structure and Change) or Core Area V (Social Psychology).

Upon completion of the bachelor's degree the student of physical education has several options. He may (1) with attention to requirements for the teaching major in the selection of undergraduate electives, complete the fifth year to meet California State Teaching Credential requirements; (2) proceed directly toward both the master's degree and the teaching credential; or (3) proceed toward a doctoral degree.

### **Requirements for the Bachelor's Degree in Prephysical Therapy**

For curricular requirements in prephysical therapy see interdepartmental major, College of Letters and Science pages 85-86.

### **Requirements for the Standard Teaching Credential**

For information concerning the teaching major consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION or confer with a departmental adviser.

**Teaching Minors.** (Elementary, Secondary, Junior College.) Eight (8) courses are required for the teaching minors as follows:

† Major and minor students may take physical education courses, beyond requirements on a pass/fail basis.

Physical Education 2, 10A-10B, 111A-111B, 120; one course selected from 113 or 119 or a dance elective; 121, 112, or 113 and 370 for secondary students. Courses required for the teaching minor may not be taken on a pass/fail basis.

#### Admission to Graduate Status

Students seeking admission to graduate status in the Department of Physical Education will be expected to meet the general requirements of the Graduate Division for admission, as described on page 29. Questions should be directed to the Chairman, Committee of Graduate Studies, Department of Physical Education.

#### Requirements for the Master's Degree

The degree of Master of Science is awarded in physical education. Study under the Thesis Plan or the Comprehensive Examination Plan (see page 155) is available.

The Master of Science degree program comprises an integrated course of study in primarily the theoretical foundations of kinesiology. The program is an interdisciplinary one with emphasis upon research and general principles. It is designed to provide the student with the intellectual orientation necessary for scholarly studies, research and professional work in the human movement field. It does so by three stages:

1. Provides a common core of knowledge, integrated by a framework of the total field, developed as a continuum of the undergraduate major in human movement;
2. Provides directions of specialization within the field; and,
3. Brings the student to the point of successful, independent research work in a selected area of specialization.

Requirements are based on a minimum of nine courses taken for this degree, of which six must be 200 series. Five courses in the 200 series must be taken in the Department of Physical Education. Three courses must be selected, with the approval of the major adviser, from one of the departments of Physiology, Psychology or Sociology. Course requirements will be developed on an individual basis in conference with a graduate adviser.

#### Requirements for the Degree of Doctor of Education

The Department of Physical Education participates with the School of Education in offering a program leading to the degree of Doctor of Education. A student consider-

ing this program should communicate with the Dean of the Graduate School of Education in this regard. For admission and program requirements see page 119. In addition consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION. Specific information regarding the degree should be obtained by correspondence or in conferences, well in advance of beginning course work, with the Dean of the Graduate School of Education and the Chairman of the Committee on Graduate Studies, Department of Physical Education.

#### Lower Division Courses

#### 1. Physical Education Activities (Men and Women). (½ course)

Four units (one full course) of Physical Education 1 may be counted toward the bachelor's degree. Graduate students may enroll on a Satisfactory/Unsatisfactory basis. Classes† meet for ninety minutes of instruction per week, scheduled in two or three meetings, depending on the nature of the activity. Program content is designated by section each semester in the printed SCHEDULE OF CLASSES. Expert instruction is available on beginning, intermediate and advanced levels in such activities as: aquatics (swimming, water safety instruction, senior lifesaving), badminton, basketball, body conditioning, dance (social, tap, square), field sports, exercise and figure control, fencing, golf, self-defense (men and women), skiing, wrestling. Mr. Fillich in charge

#### 2A-2Z. Fundamentals of Human Performance (Men and Women). (¼ course each)

Lecture, one hour; laboratory, two one-half hour sessions. Open to Physical Education major and minor students only. The principles of conditioning and improvement of human performance. 2A, Badminton; 2B, Basketball (M); 2C, Basketball (W); 2D, Dance (Folk-social); 2E, Modern Dance; 2F, Field Sports (M); 2G, Field Sports (W); 2H, Football (M); 2J, Golf; 2K, Gymnastics; 2L, Scuba; 2M, Softball (W); 2N, Swimming; 2P, Tennis; 2R, Track and Field; 2S, Volleyball; 2T, Wrestling (M); 2U, Elementary School Activities; 2V Care and Prevention of Athletic Injuries. Unless otherwise specified, all sections are coeducational.

Miss Martin in charge

#### 10A-10B. Introduction to Kinesiology.

(Formerly numbered 4A-4D and 10.) Lecture, three hours; laboratory, two hours. Required of all physical education majors and teaching minors in physical education. Basic concepts in the study of human movement.

Miss Brown in charge

#### 15A. Human Neuromuscular Anatomy.

Prerequisites: Physical Science 1 and 2 and Biology 2. Anatomy of the human skeletal, muscular, and nervous systems. Basic concepts of sensorimotor processes in relation to neuromuscular control with particular reference to human movements are also emphasized.

Mr. Edgerton, Mr. Smith

† Towels and gymnasium clothing, except shoes and bathing caps, are furnished. Information concerning special equipment and course fee required for some activities may be obtained in departmental offices.



**15B. Introduction to Human Physiology.**

Prerequisites: Biology 2; Physical Science 1 and 2; or consent of the instructor. An introduction to human physiology. Mr. Edgerton, Miss Smith

**Upper Division Courses**

**110A-110B. General Kinesiology.**

Lecture, three hours; laboratory, two hours. Prerequisite: courses 10A-10B; Biology 1A-1B-1C or 2A and Physical Education 15A-15B; Physical Sciences 1 and 2 or Chemistry 1A-1B-1C; Sociology 18 or Psychology 141 (may be taken concurrently with 110A). Relationship between man's movement and his structure, function and behavior. Mr. Egstrom, Mr. Gardner

**111A-111B. Elements of Kinesiology.**

Lecture, four hours. Not open to Physical Education major students. 111A must be completed prior to enrollment in 111B. A study of the biological and physical principles of movement and the effects of movement upon the structure and function of the human body. Miss V. Hunt, Miss Smith

**112. Analysis of Expressive Movement.**

Lecture, three hours; laboratory, two hours. Prerequisite: courses 110A-110B or 111A-111B or consent of the instructor. Interpretation of the expressive aspects of human movement. Miss Hunt

**113. Assessment of Human Movement Skill.**

Lecture, three hours; laboratory, two hours. Prerequisite: courses 110A-110B or 111A-111B. Analysis and evaluation of movement skills under varying environmental conditions. Mr. Egstrom

**\*114. Kinesiotherapy.**

Lecture, three hours; laboratory, two hours. Prerequisite: courses 110A-110B. The role of exercise in the improvement of movement in physically handicapped individuals. Mr. Gardner in charge

**116. Conditioning for Maximal Performance.**

Prerequisite: courses 110A-110B. The study of anatomical, physiological and psychological barriers to maximal performance. Examination and evaluation of theories of conditioning. Mr. Edgerton

**119. Movement Strategy in Team Play.**

(Formerly numbered 162A-162I.) Prerequisite: advanced knowledge in team sports, specifically football, basketball, soccer and baseball and consent of the instructor. The study of defensive and offensive strategy in selected team sports. Mr. Duncan, Miss Martin, Miss McIntyre

**120. Human Movement Development.**

Prerequisite: upper division standing. Movement development throughout life with emphasis upon individual and societal determinants. Mr. Keogh, Mr. Cratty

**121. Nature and Theory of Physical Education for Children.**

Lecture, three hours; laboratory, two hours. Prerequisite: Consent of instructor. Not open to physical education major students. Exploration of varied, graded and sequential physical activities for children. Miss Latchaw

**122. Perceptual-Motor Education.**

Lecture, three hours; laboratory, two hours. Prerequisite: courses 110A-110B; course 120 recommended. Movement problems of the minimally-neurologically handicapped with emphasis on the clumsy-child syndrome. Mr. Cratty

**136. Sports in American Life.**

Prerequisite: junior standing and consent of the instructor. The national and international roles and interrelationships of American sports emphasizing socio-cultural variables, changing patterns, current trends, problems and issues. Mrs. Bell, Mr. Loy, Mr. Snyder

**139A-139B. Leisure and Recreation in Contemporary Society.**

(Formerly numbered 139 and 140.) Prerequisite: consent of the instructor. A consideration of the historical development, philosophical concepts and social forces influencing leisure and recreation in American life. Mrs. Arnold

**148. History of Physical Education in the United States.**

Prerequisite: upper division standing or consent of the instructor. Challenge, continuity, and change underlying human movement programs. Mr. B. Miller

**190A-190B. Field Studies.**

Prerequisite: consent of the instructor. The Staff

**193. Kinesiometrics.**

Prerequisite: consent of the instructor. Measurement and instrumentation in Kinesiology. Mr. Massey

**199. Special Studies in Kinesiology. (½ or 1 course)**

Prerequisite: senior standing and consent of the instructor and Departmental Chairman. A student may count this course only once to satisfy his major in Physical Education. He may take it a second time to meet University Graduation requirements. The Staff

**Graduate Courses**

**200. Philosophy in Physical Education.**

(Formerly numbered 250.) Study of philosophical thought influencing physical education programs in contemporary United States of America. Miss Latchaw

**201. Social Bases of Leisure and Recreation.**

(Formerly numbered 266.) A synthesis of basic concepts and processes underlying theories of leisure and recreation with implications for solution of fundamental problems. Mrs. Arnold, Mr. N. Miller

**205. Advanced Kinesiotherapy.**

(Formerly numbered 258.) Selected studies in therapeutic exercises. Mr. Gardner

**210. Human Movement Theory.**

(Formerly numbered 265.) Significant theoretical formulations of the body of knowledge of human movement. Miss Brown

**215. Social Correlates of Human Movement.**

(Formerly numbered 266.) Cultural derivation, and style and pattern variations of human movement. Mrs. Arnold

\* Not to be given, 1970-1971.

**220. Exercise Physiology.**

(Formerly numbered 267.) Response of organs and systems to exercise, and physiological mechanisms underlying elements of human performance.

Mr. Gardner, Mr. Morehouse

**225. Movement Behavior.**

A study of man's movement responses. Miss Hunt

**227. Human Movement Learning.**

Analysis of selected variables which influence the learning of skills. Mr. Cratty

**231. Environmental Kinesiology.**

Modifications of human movement and kinesiological adaptations to physical environments.

Mr. Edgerton, Mr. Morehouse

**235. Evaluation Procedures.**

Analysis of kinesiological data. Mr. Massey

**240A-240B. History of Human Movement Programs.**

240A. U. S. History; 240B. World History. Historical development of physical education from the national and international perspectives. Mr. E. Miller

**241. Comparative Physical Education and Sports.**

(Formerly numbered 280G.) Comparative analysis of recent developments and of emergent characteristics of patterns and systems of Physical Education and Sports in representative nations and world regions as influenced by geographical, political, economic, socio-cultural, religious, educational and historical factors.

**275. Research in Human Movement.**

Application of research designs to problems in human movement. The Staff

**280A-280F. Advanced Topics in Kinesiology.**

The subject matter of these courses will be in a field of kinesiology in which the staff member giving the course has developed special proficiency owing to his research interest.

280A. Biochemistry of Exercise. Mr. Edgerton

280B. Electromyographic Assessment of Human Action. Miss Hunt

280C. Studies of Children with Movement Problems. Mr. Keogh

280D. Underwater Kinesiology. Mr. Egstrom

280E. Kinesthesia and Gross Action Patterns. Mr. Cratty

280F. Leisure and Recreation Modifiers. Mrs. Arnold

280G. Neuromuscular Mechanisms and Motor Performance. Miss Smith

**Professional Courses****370. Teaching of Physical Education.**

Lecture, two hours; laboratory, five hours. Prerequisite: upper division standing, assurance that activity proficiencies have been satisfied and consent of the instructor. May be taken concurrently with Education 130. Accepted as education elective for the Standard Teaching Credential. Class management, organization of teaching materials and methods of subject matter presentation. Mr. Handy

**401. Curriculum in Physical Education.**

(Formerly numbered 201.) The identification of subject matter for elementary, secondary and college programs in physical education. Miss Brown, Mr. Handy

**402. Administration of Physical Education.**

(Formerly numbered 256.) Principles and policies applied to the unique organizational problems of physical education. Mr. Snyder

**Individual Study and Research****596A-596ZZ. Directed Individual Study or Research. (½ to 2 courses)**

To be arranged with the member of the faculty who will direct the study or research. May not be used to fulfill any course requirements for the master's degree. The member of the faculty directing the study or research will be identified by a two-letter code as follows: S. E. Arnold, 596SA; C. Brown, 596CB; B. J. Cratty, 596BC; V. R. Edgerton, 596VE; G. H. Egstrom, 596GE; G. W. Gardner, 596GG; D. T. Handy, 596DH; V. V. Hunt, 596VH; J. F. Keogh, 596JK; M. Latchaw, 596ML; W. W. Massey, 596WM; B. W. Miller, 596BM; N. P. Miller, 596NM; L. E. Morehouse, 596LM; J. L. Smith, 596JS; R. A. Snyder, 596RS. Graded on a satisfactory/unsatisfactory basis. The Staff

**597. Preparation of Master's Comprehensive****Examination. (½ to 2 courses)**

Prerequisite: consent of the Department of Physical Education Adviser. Course 597 may not be used to fulfill any of the course requirements for the master's degree. Graded on a satisfactory/unsatisfactory basis.

The Physical Education Graduate Adviser

**598A-598ZZ. Research for and Preparation of the Master's Thesis. (½ to 4 courses)**

Each member of the faculty supervises research of master's students and holds research group meetings, seminars, and discussions with students that take his master's research course which is identified by the same two-letter code used to identify the 596 course. Course 598 may not be used to fulfill any of the course requirements for the master's degree. Graded on a satisfactory/unsatisfactory basis. The Staff

**PHYSICAL SCIENCES****1. Physics.**

Lecture and demonstration, three hours; quiz and discussion, one hour. Prerequisite: two years of high school mathematics which are acceptable as mathematics for admission to UCLA. This course satisfies in part the College of Letters and Science E requirement in the physical sciences for nonphysical science

majors. An introductory survey course in classical and modern physics. This portion of the College of Letters and Science E requirement may be satisfied by examination. Students must arrange in advance through the Physics Department Undergraduate Affairs Office (Knudsen Hall 3-145R) to take the final examination in a regular section of the course. Entering students may arrange to take the examination

any time after they have received official notification of admission.

## 2. Chemistry.

(Same as Chemistry 2.) Lecture and quiz, four hours. This course is designed to meet part of the College of Letters and Science requirements for non-science majors and similar requirements in other colleges. The course deals with the concept of the submicroscopic world of chemistry, and ranges from protons to proteins in subject matter. This course is not open to students who have received credit for Chemistry 1A. Mr. Hardwick, Mr. Kaesz

## 3A. Astronomy.

Lectures three hours, discussion one hour. Not open to students who have taken or are taking Astronomy 101 or 103A. An introductory survey course in the general principles and the fundamental facts of astronomy, designed primarily for students not majoring in a physical science or mathematics. The Staff

## 3G. Geology.

Lecture, three hours; laboratory, two hours; field trips. Prerequisite: course 2, or equivalent. Elements of earth science; study of earth materials; the nature and interpretation of geologic evidence; study of geologic processes; historical aspects of geology. The Staff

## 3M. Meteorology.

Lecture, three hours; laboratory, two hours. Prerequisite: courses 1 and 2 or equivalent. Introduction to the phenomena and processes which occur in atmospheric environment. The Staff

### Professional Course in Methods

## 370. Methods and Materials for Teaching Physical Sciences.

Prerequisite: graduate or senior standing. Methods and materials for teaching physical sciences in secondary schools. Solution of special problems which arise in secondary school physical science courses.

# ■ PHYSICS

(Department Office, 3174 Knudsen Hall)

Alfredo Baños, Jr., Dr.Eng., Ph.D., *Professor of Physics.*

Hans E. Bömmel, Ph.D., *Professor of Physics.*

Rubin Braunstein, Ph.D., *Professor of Physics.*

Nina Byers, Ph.D., *Professor of Physics.*

Robert J. Finkelstein, Ph.D., *Professor of Physics.*

A. Theodore Forrester, Ph.D., *Professor of Physics and Engineering.*

Burton Fried, Ph.D., *Professor of Physics.*

Christian Fronsdal, Ph.D., *Professor of Physics.*

Theodore Holstein, Ph.D., *Professor of Physics.*

George J. Igo, Ph.D., *Professor of Physics.*

\*\*Leon Knopoff, Ph.D., *Professor of Physics and Geophysics.*

Kenneth R. MacKenzie, Ph.D., *Professor of Physics.*

Steven A. Moszkowski, Ph.D., *Professor of Physics.*

Richard E. Norton, Ph.D., *Professor of Physics.*

Raymond L. Orbach, Ph.D., *Professor of Physics.*

Philip A. Pincus, Ph.D., *Professor of Physics.*

J. Reginald Richardson, Ph.D., *Professor of Physics.*

Isadore Rudnick, Ph.D., *Professor of Physics.*

J. J. Sakurai, Ph.D., *Professor of Physics.*

Robert A. Satten, Ph.D., *Professor of Physics (Vice-Chairman of the Department).*

David S. Saxon, Ph.D., *Professor of Physics.*

Peter Schlein, Ph.D., *Professor of Physics.*

Donald H. Stork, Ph.D., *Professor of Physics.*

Harold K. Ticho, Ph.D., *Professor of Physics (Chairman of the Department).*

Byron T. Wright, Ph.D., *Professor of Physics.*

Carl M. York, Ph.D., *Professor of Physics.*

Leo P. Delsasso, Ph.D., *Emeritus Professor of Physics.*

Laurence E. Dodd, Ph.D., *Emeritus Professor of Physics.*

Joseph Kaplan, Ph.D., Sc.D., L.H.D., *Emeritus Professor of Physics.*

Vern O. Knudsen, Ph.D., LL.D., *Emeritus Professor of Physics.*

Norman A. Watson, Ph.D., *Emeritus Professor of Physics.*

Ernest S. Abers, Ph.D., *Associate Professor of Physics.*

\*\* Member of the Institute of Geophysics and Planetary Physics.

Marvin Chester, Ph.D., *Associate Professor of Physics.*  
 W. Gilbert Clark, Ph.D., *Associate Professor of Physics.*  
 John Cornwall, Ph.D., *Associate Professor of Physics.*  
 Darrell J. Drickev, Ph.D., *Associate Professor of Physics.*  
 Roy P. Haddock, Ph.D., *Associate Professor of Physics.*  
 Charles Kennel, Ph.D., *Associate Professor of Physics.*  
 Bernard Nefkens, Ph.D., *Associate Professor of Physics.*  
 William E. Slater, Ph.D., *Associate Professor of Physics.*  
 Alfred Wong, Ph.D., *Associate Professor of Physics.*  
 Eugene Wong, Ph.D., *Associate Professor of Physics.*  
 Peter Barrett, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Charles D. Buchanan, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Jeffrey Davis, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Shun-Yi Lee, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Moises Levy, Ph.D., *Assistant Professor of Physics.*  
 Jean-Luc Perrenoud, Ph.D., *Adjunct Assistant Professor of Physics.*  
 F. David Rudnick, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Peter Seligmann, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Paul Shepard, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Jules W. Sunier, Ph.D., *Assistant Professor of Physics.*  
 Peter Truoeel, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Don Villarejo, Ph.D., *Assistant Professor of Physics.*  
 Charles A. Whitten, Ph.D., *Assistant Professor of Physics.*  
 Glenn Williamson, Ph.D., *Adjunct Assistant Professor of Physics.*  
 Chun-Wa Wong, Ph.D., *Assistant Professor of Physics.*  
 Michael Woolf, Ph.D., *Assistant Professor of Physics.*



Ivo Slaus, Ph.D., *Visiting Professor of Physics.*  
 Edward Teller, Ph.D., Sc.D., *Professor of Physics at Large.*

### Preparation for the Major in Physics

Required: Physics 7A†–7B–7C–7D (to be taken in the order listed); Chemistry 1A–1B–1C; Mathematics 11A–11B–11C, 12A–12B–12C.

### The Major in Physics‡

The required courses are Physics 105A, 105B, 110A, 110B, 112A, 115A, 115B, 131 or 131A, three courses from the Physics 180 series, four additional upper division physics courses (excluding 121 and 199), and Mathematics 132 or at least one other upper division course in mathematics which must be approved by an adviser. A C average is required in the above courses. A reading knowledge of Russian, German, or French is recommended. This major leads to the Bachelor of Science degree.

† See explanation of lower division courses on page 443.

‡ A mimeographed brochure giving more detailed information than is contained in this bulletin is obtainable from the Office of Undergraduate Affairs, Department of Physics.

Students preparing for graduate school should take additional courses in physics and mathematics. Physics 113, 122, 124, 126, and 140 are recommended.

*Transition to the Quarter System for Students Who Entered Before Fall, 1966.* Students must satisfy the requirements stated above. In applying semester courses toward these requirements, students who have credit for the following semester courses will be deemed to have satisfied the corresponding quarter courses indicated in parentheses: Chemistry 1A (1A); Chemistry 1A–1B (1A–1B–1C); Mathematics 11A (11A), 11B (11B–11C), 12A (12A), 12B (12B–12C); Physics 1A (7A), 1B (7C), 1C (7B), 1D (7D), 105 (105A–105B), 108B (108), 110A (110A), 110B (110B), 112 (112A), 113 (113), 114 (114), 115, (115A–115B), 122 (122), 124A (124), 126 (126), 131 (131), 140 (140). The equivalences listed above are for the purpose of determining which quarter courses a student must take to meet the B.S. degree requirements in Physics. A student who has com-

pleted any two of the laboratory courses Physics 108C, 113C, 114C, 116C, 124C, will be deemed to have satisfied the laboratory requirement of the Physics 180 series. A student who has completed one of the former semester laboratory courses will be required to take two laboratory courses from the 180 series.

#### Requirements for the Standard Secondary Credential

For the requirements, consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

#### Requirements for the Degree of Master of Science§

*Prescribed Courses.* The University requires a total of nine courses for the M.S. degree. The Physics Department requires that a minimum of six of the nine be graduate courses in physics of which the student must pass any four of the five fundamental courses: 231A, 220A, 210A, 215A, and 221A. The remaining three courses may be satisfied by upper division or graduate courses, not necessarily in physics, which are acceptable to the Physics Department. No more than two of the three courses may be chosen from Physics 596 or seminar courses. Physics 597 and Physics 598 are not acceptable courses for the M.S. degree.

*Comprehensive Examination.* A passing grade on a written comprehensive examination is required. It is required that it be taken during the first year by UCLA graduates in physics or not later than the fourth quarter of residence by other students. This examination is given twice a year in the Fall and Spring Quarters.

Although this Department operates under the "comprehensive examination plan," rather than the "thesis plan," arrangements generally can be made for a student to write a master's thesis, provided he has a particularly interesting research problem, and provided some professor is willing to undertake the guidance of his work. In this case the student must petition the Departmental Committee of Graduate Advisers for permission to pursue the "thesis plan." The comprehensive examination requirement is waived if the petition is approved.

*Scholarship Requirements.* A B average is required in physics as well as an overall B average in all courses taken in graduate status.

*Transition to the Quarter System for Students Who Entered Before Fall 1966.* Students who have completed five semester lecture courses by June 30, 1966, will be required to complete a total of eight courses for the M.S. degree instead of nine. Other students will be required to complete nine courses.

#### The Master of Arts, Teaching (M.A.T.) Degree

This degree leads to qualification for teaching credentials at the secondary school or elementary school level. A brochure which describes the program is available on request to the Department of Physics.

#### Requirements for the Degree of Doctor of Philosophy§

For the general requirements see pages 156-160. The foreign language requirement follows: completion of course 5, or five quarters of study, or its equivalent in one of French, German or Russian with a minimum grade of C in each course, or a score of at least 500 in the Educational Testing Service examination in one of the three languages. The qualifying examinations for candidates for the Ph.D. degree in physics include (1) a written comprehensive examination; (2) final written examinations in each of the courses 220A, 210A, 221A, 215A, and 231A; (3) a comprehensive departmental oral examination; and (4) a qualifying oral examination in the student's chosen field conducted by a committee appointed by the Graduate Council, upon nomination by the Department Chairman. The same committee guides the candidate's research, approves his dissertation, and conducts a final examination.

#### Lower Division Courses

Physics 7A-7B-7C-7D form a sequence of courses in general physics for majors in physics. All or part of the sequence is also required or recommended as first choice for major students in: astronomy, chemistry, engineering, geology, mathematics, meteorology, and certain interdepartmental fields of concentration. Physics 7A-7B-7C-7D are the courses formerly numbered 1A-1C-1B-1D respectively (note reversal of order).

The Department desires to take into account prior preparation in physics. Students who feel their background would permit acceleration may take 7A, 7B, 7C, or 7D by

§ A brochure giving additional information of interest to graduate students in physics is obtainable from the Office of Graduate Affairs, Department of Physics.

examination with a class at the end of any quarter. Qualified students are urged to discuss such possibilities with their advisers.

Physics 2A-2B-2C form a one-year sequence of courses in general physics (with laboratory) primarily for students in the biological and health sciences but open to any student who meets the prerequisites. In this sequence only algebra and trigonometry are used in providing a mathematical description of physical phenomena: calculus is not used.

Physics 6A-6B-6C form a one-year sequence of courses in basic physics for students in the biological and health sciences. However, unlike Physics 2A-2B-2C, calculus is used throughout and satisfactory completion of basic calculus courses is a prerequisite for admission to this sequence. Individual departments will, on an individual basis, advise students as to which physics sequence is required for each major. After an interim period, it is expected that all zoology and bacteriology majors will be required to complete the physics 6A-6B-6C sequence.

Credit for a maximum of four courses will be permitted for any combination of courses in the Physics 7A-7B-7C-7D, 2A-2B-2C and 6A-6B-6C series.

Physical Sciences 1 is a one quarter, non-laboratory course which surveys the whole field of physics. It is designed for the liberal arts student and satisfies in part the College of Letters and Science E requirement in the Physical Sciences for nonphysical science majors.

#### Lower Division

### Physical Sciences 1. Physics.

See Physical Sciences, page 440.

### 2A. General Physics: Mechanics of Solids and Fluids.

Lecture and demonstration, four hours; laboratory, two hours. Prerequisite: three years of high school mathematics including trigonometry, or two years of high school mathematics and one one-term college course in mathematics with trigonometry included in the group of courses; or the equivalent courses. Physics 2A is not open for credit to students who have credit for Physics 7A or the equivalent.

### 2B. General Physics: Heat, Sound, and Light.

Lecture and demonstration, four hours; laboratory, two hours. Prerequisite: course 2A or 7A or equivalent.

### 2C. General Physics: Electricity and Magnetism, Atomic and Nuclear Physics.

Lecture and demonstration, four hours; laboratory, two hours. Prerequisite: course 2B or 7C or equivalent.

### 6A. Physics for Life Science Majors: Mechanics and Wave Motion.

Lecture and demonstration, four hours; discussion, one hour. Prerequisite: Mathematics 3A, 3B and 3C or the equivalent. Mathematics 3C may be taken concurrently.

### 6B. Physics for Life Science Majors: Electricity and Magnetism.

Lecture and demonstration, four hours; laboratory, two hours. Prerequisite: Physics 6A.

### 6C. Physics for Life Science Majors:

#### Thermodynamics, Light and Modern Physics.

Lecture and demonstration, four hours; laboratory two hours. Prerequisite: course 6B.

### †7A. General Physics: Mechanics of Solids.

(Formerly numbered 1A.) Lecture and demonstration, four hours; discussion, one hour. Prerequisite: high school physics or chemistry, preferably both; Mathematics 11A completed and 11B concurrent with Physics 7A; or equivalent courses.

### †7B. General Physics: Electricity and Magnetism.

(Formerly numbered 1C.) Lecture and demonstration, three hours; laboratory, two hours; discussion, one hour. Prerequisite: course 7A; Mathematics 11B completed and 11C concurrent with Physics 7B; or equivalent courses.

### 7C. General Physics: Mechanics of Fluids, Heat and Sound.

(Formerly numbered 1B.) Lecture and demonstration, three hours; laboratory, two hours; discussion, one hour. Prerequisite: course 7A; Mathematics 11C completed and 12A concurrent with Physics 7C; or equivalent courses.

### †7D. General Physics: Light and Modern Physics.

(Formerly numbered 1D.) Lecture and demonstration, three hours; laboratory, two hours; discussion, one hour. Prerequisite: courses 7A and 7B; Mathematics 12A completed and 12B concurrent with Physics 7D; or equivalent courses.

#### Upper Division Classes

Prerequisite for all upper division courses: Physics 7A-7B-7C-7D; Mathematics 11A-11B-11C, 12A-12B, and (except for Physics 105A and 116) 12C; or consent of the instructor. Students must complete one quarter of upper division physics before enrolling in the 180 laboratory series.

### 105A. Analytic Mechanics.

Newtonian, Lagrangian, Hamiltonian, and relativistic mechanics. One, two and many particle systems, gravitational potentials, linear and nonlinear oscillations.

† Life science majors required to take Physics 7A, 7B, and 7D may use Mathematics 3A, 3B, and 3C as prerequisites as follows: Mathematics 3A completed and 3B concurrent with Physics 7A; Mathematics 3B completed and 3C concurrent with Physics 7B; Mathematics 3C completed for Physics 7D.

**105B. Analytic Mechanics.**

Prerequisite: course 105A. Central force motion, two-particle collisions, non-inertial reference frames, rigid bodies, coupled oscillators, normal modes of oscillation, and mechanics of continuous media.

**108. Physical Optics.**

Prerequisite: courses 110B and 131. Interference, diffraction, dispersion, molecular scattering, absorption of radiation. Anisotropic media; crystal optics, optical activity, Faraday and Kerr effects. Non-linear optics. Theory of spectral line width. Coherence and partial coherence.

**110A. Electricity and Magnetism.**

Prerequisite: course 131A. Electrostatics and magnetostatics.

**110B. Electricity and Magnetism.**

Prerequisite: course 110A. Faraday's law and Maxwell's equations. Propagation of electromagnetic radiation. Multipole radiation and radiation from an accelerated charge. The special theory of relativity.

**112A. Thermodynamics.**

Fundamentals of thermodynamics including the first, second, and third laws. The statistical mechanical point of view and its relation to thermodynamics. Some simple applications of the foregoing.

**112B. Thermodynamics.**

Applications of thermodynamics and statistical mechanics to particular systems.

**113. Atomic Structure.**

Prerequisites: courses 131 and 115B. The theory of atomic structure. Interaction of radiation with matter.

**114. Mechanics of Wave Motion and Sound.**

Vibrating systems and wave propagation in gases, liquids and solids including elements of hydrodynamics and elasticity. Applications in ultrasonics, low temperature physics, solid state physics, architectural acoustics.

**115A. Elementary Quantum Mechanics.**

Prerequisites: courses 105B and 131 (may be taken concurrently). The classical background, basic ideas and methods of quantum mechanics.

**115B. Elementary Quantum Mechanics.**

Prerequisite: course 115A. Development of the methods and concepts of quantum mechanics.

**115C. Elementary Quantum Mechanics.**

Prerequisite: course 115B. The elements of group representation theory and their application to the quantum mechanics of atoms, molecules and solids.

**116. Electronics.**

Three hours of lecture and three hours of laboratory. Alternating current circuits, vacuum tube characteristics and parameters, transistor characteristics and parameters, amplifiers, oscillators, non-linear tube and transistor circuits.

**121. Modern Physics.**

Not open for credit to physics majors. The atomic nature of matter and atomic composition. The propagation of electromagnetic waves and their interaction

with matter. Special relativity. Atomic spectra and electron distribution. Basic concepts of wave mechanics.

**122. Plasma Physics.**

Prerequisite: course 110A. Atomic processes and particle motions; equilibrium and shielding; fluid and kinetic descriptions; transport properties; m waves and instabilities; electromagnetic interaction. Production, confinement, heating and diagnostics. Application to fusion and space.

**124. Nuclear Physics.**

Prerequisite: course 115A. Nuclear charge, mass, radius, spin, and moments; nuclear models; nuclear forces; alpha, beta, and gamma emission.

**126. Elementary Particle Physics.**

Prerequisite: course 115B. Experimental determination of the properties of elementary particle states. Relativistic kinematics and phase space; angular momentum and isotopic spin formalism; elastic and inelastic scattering; invariance principles and conservation laws; strong, electromagnetic, and weak interactions. Survey of important experiments.

**Physics 131A. Mathematical Methods of Physics.**

Vector differential operators. Partial differential equations of physics; Bessel functions; Legendre functions. Fourier series. Integral transforms. Complex variables.

**Physics 131B. Mathematical Methods of Physics.**

Prerequisite: course 131A or equivalent. Matrices and eigenvalues; tensors. Green's functions. Probability theory. Calculus of variations.

**140. Introduction to Solid State Physics.**

Prerequisite: course 115B or equivalent. Introduction to the basic theoretical concepts of solid state physics with applications. Crystal symmetry; cohesive energy; diffraction of electron, neutron, and electromagnetic waves in a lattice; the reciprocal lattice; phonons and their interactions; free electron theory of metals; energy bands.

**‡180A. Nuclear Physics Laboratory. (1 course)****‡180B. Physical Optics and Spectroscopy Laboratory. (1 course)****‡180C. Solid State Physics Laboratory. (1 course)****‡180D. Acoustics Laboratory. (1 course)****‡180E. Plasma Physics Laboratory. (1 course)****‡180F. Elementary Particle Physics Laboratory. (1 course)****198. Special Courses in Physics. (½ to 1½ courses)****199. Special Studies in Physics. (½ to 1 course)**

May be repeated, but not more than three courses may be applied toward the bachelor's degree.

‡ Enrollment is limited and controlled. For details consult the Office of Undergraduate Affairs.

## Graduate Courses

**210A. Electromagnetic Theory.**

Boundary value problems in electrostatics and magnetostatics. Multipole expansions; dielectrics and macroscopic media. Maxwell's equations and conservation laws. Wave guides and resonators; simple radiating systems.

**210B. Electromagnetic Theory.**

The electromagnetic potentials and the Hertz vectors. Cylindrical waves. Spherical waves. The Debye potentials. Multipole radiation. Classical relativistic electrodynamics. Radiation from moving charges.

**\*213A. Advanced Atomic Structure.**

Group representation theory. Angular momentum and coupling schemes. Interaction of radiation with matter.

**\*213B. Advanced Atomic Structure.**

The  $n$ - $j$  symbols, continuous groups, fractional parentage coefficients,  $n$  electron systems.

**\*213C. Molecular Structure.**

Application of group theory to vibrational and electronic states of molecules. Molecular orbital theory. Raman effect. Angular momentum and coupling in molecules.

**\*214A. Advanced Acoustics.**

Propagation of waves in elastic and fluid media. Reflection, refraction, diffraction, and scattering of waves in fluids. Attenuation mechanisms in fluids.

**\*214B. Advanced Acoustics.**

Propagation in nonhomogeneous fluids and in moving fluids. Radiation pressure, acoustic streaming, and attenuation in large amplitude sound fields. Propagation of sound in liquid helium. Mechanisms resulting in attenuation for elastic waves in solids.

**215A. Thermodynamics.**

Thermodynamics and statistical mechanics with applications.

**215B. Nonequilibrium Statistical Mechanics.**

Probability theory, Markov processes, equations of change, BBGKY hierarchy and its consequences, Boltzmann equation, Chapman-Enskog method, transport coefficients, fluctuation-dissipation theorems, density matrix, H-theorems.

**215C. Quantum Statistical Mechanics and the Many Body Problem.**

Classical methods for interacting systems; quantum field theory techniques in statistical mechanics; Green's-function approach; the Coulomb gas; the imperfect Bose gas; electron-phonon interaction; superconductivity; phase transitions; theory of Fermi liquid.

**220A. Foundations of Classical and Quantum Mechanics.**

An integrated presentation of the foundations of classical and quantum mechanics.

**\*220B. Mechanics of Continuous Media.**

Stress-strain relations. Dynamic elasticity. Hydro-

\* Not to be given every year.

dynamic equations for compressible viscous fluids. Elastodynamic wave motion. Fluid flow past boundaries. Hydrodynamic wave motion. Turbulence. Stability.

**221A. Quantum Mechanics.**

Foundation of quantum mechanics with applications. Perturbation theory. Theory of scattering.

**221B. Quantum Mechanics.**

Formal theory of scattering. Introduction to relativistic quantum mechanics.

**222A-222B-222C. Plasma Physics.**

Properties of a Coulomb gas, with and without a magnetic field: equilibrium, oscillations, instabilities, fluctuations, collective phenomena, transport properties, and radiation. Description via single-particle orbit theory, magnetohydrodynamics, and kinetic equations of various types.

**224. Introduction to the Strong Interaction.**

Evidence concerning the strong interaction, particularly as exemplified in nucleon-nucleon and pion-nucleon systems. Isospin, the scattering matrix, the density matrix and polarization, the properties of pions, the one pion exchange potential, phase shift analysis.

**225A. Advanced Nuclear Physics.**

An advanced course in the structure of complex nuclei, nuclear models, and nuclear reactions. Normally preceded by course 224.

**225B. Advanced Nuclear Physics.**

Nuclear beta decay, neutrino experiments, parity violation, conserved vector current theory, interaction between nucleons and the electromagnetic field.

**226A. Elementary Particle Physics.**

Prerequisite: courses 221B and 224. Relativistic kinematics and phase space calculations; S-matrix theory, cross-section and decay-rate calculations; C,P,T invariance; survey of elementary particles, determination of quantum numbers, higher symmetries; inelastic scattering and K-matrix theory; low energy scattering experiments, peripheral model; nonleptonic decays.

**226B. Elementary Particle Physics.**

Review of Feynman rules, nucleon form factors; gamma decay; universal Fermi interaction, nucleon and muon decay, muon capture, nonconservation of parity; survey of nonleptonic and leptonic decays of baryons and mesons, the KK system; conserved vector current theory, SU(3) and weak interactions; high energy scattering.

**230A-230B-230C. Relativistic Quantum Theory.**

Quantum electrodynamics, general quantum field theory, S-matrix theory.

**231A. Methods of Mathematical Physics.**

(Same as Mathematics 266A.) Students may not receive credit for both Physics 231A and Mathematics 266A. Linear operators, review of functions of a complex variable, integral transforms, partial differential equations.

**231B. Methods of Mathematical Physics.**

(Same as Mathematics 266B.) Students may not receive credit for both Physics 231B and Mathe-



maths 266B. Ordinary differential equations, partial differential equations, and integral equations. *Calculus of variations.*

### 231C. Methods of Mathematical Physics.

(Same as Mathematics 266C.) Students may not receive credit for both Physics 231C and Mathematics 266C. Perturbation theory. Singular integral equations. Numerical methods.

### \*232. Relativity.

The special and general theories with applications to elementary particles and astrophysics.

### 240A. Solid State Physics.

Prerequisite: course 140. Phenomena of solid state physics. Semiconductors, magnetism and magnetic resonance, the Mössbauer effect, superconductivity.

### 240B. Solid State Physics.

Prerequisite: course 140. Phenomena of solid state physics. Dielectric properties of solids, transport processes, optical phenomena in insulators, ferroelectricity, point defects, dislocations.

### 241A. Solid State Theory.

Prerequisites: courses 215A, 221A and 140. Energy bands in solids, elementary excitations and their interactions.

### 241B. Solid State Theory.

Prerequisite: course 241A. Transport theory, superconductivity.

### 241C. Solid State Theory.

Prerequisite: course 241B. Collective effects in magnetism, introduction to many body effects in solids.

### \*242A-242B-242C. Advanced Solid State Theory.

Prerequisites: courses 241A-241B-241C (may be taken concurrently). Many body effects in solids.

### 260. Seminar-Problems in Plasma Physics.

### 261. Seminar in Special Problems in Theoretical Physics.

### 262. Seminar in Physics of the Solid State.

### 264. Seminar in Advanced Physical Acoustics.

### 266. Seminar in Propagation of Waves in Fluids.

### 268. Seminar in Spectroscopy.

### 269A. Seminar in Nuclear Physics.

### 269B. Seminar in Elementary Particle Physics.

### 281. Experimental Techniques in Nuclear Physics.

A laboratory course with some lectures on the theory of the techniques currently in use and on the statistical treatment of data. An effort is made to develop a critical research attitude on the part of the student.

### \*284. Advanced Laboratory in Acoustics and Cryogenics.

Selected advanced experiments in acoustics and cryogenics designed to train the student in the techniques and instrumentation used in acoustic research and low temperature physics.

#### Professional Course in Method

### 370. The Teaching of Physics.

Prerequisite: consent of the instructor. A study of the physics laboratory experiments and demonstrations available today for secondary school and community college physics courses. This course is part of the Master of Arts, Teaching (M.A.T.) program, but is open to other interested students also.

See also Physical Sciences, page 440.

#### Individual Study and Research

### 596. Directed Individual Studies. (½ to 2 courses)

### 597. Preparation for Master's Comprehensive Examinations and Doctoral Qualifying Examinations.

### 598. Master's Thesis Research and Writing.

### 599. Doctoral Research and Writing. (2 to 3 courses)

#### Courses in Related Fields

A number of courses of interest to physicists are also listed under Astronomy, Geophysics, Meteorology, and Planetary and Space Science in particular: Astronomy 117A-117B-117C; Geophysics 241; Meteorology 223A-223B-223C, 225C, 228A-228B, 229, 242, 243, and 244; Planetary and Space Science 101, 225A-225B, 260A-260B, and 265.

## ■ PHYSIOLOGY

(Department Office, 53-247 Center for the Health Sciences)

W. Ross Adey, M.D., *Professor of Anatomy and Physiology.*

Nicholas S. Assali, M.D., *Professor of Obstetrics and Gynecology and Physiology.*

Allan J. Brady, Ph.D., *Professor of Physiology in Residence.*

Mary A. B. Brazier, B.S., Ph.D., D.Sc., *Professor of Anatomy and Biophysics and Physiology in Residence.*

Jared M. Diamond, Ph.D., *Professor of Physiology.*

\* Not to be given every year.

matics 266B. Ordinary differential equations, partial differential equations, and integral equations. Calculus of variations.

### 231C. Methods of Mathematical Physics.

(Same as Mathematics 266C.) Students may not receive credit for both Physics 231C and Mathematics 266C. Perturbation theory. Singular integral equations. Numerical methods.

### \*232. Relativity.

The special and general theories with applications to elementary particles and astrophysics.

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Prerequisite: course 140. Phenomena of solid state physics. Semiconductors, magnetism and magnetic resonance, the Mössbauer effect, superconductivity.

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## ■ PHYSIOLOGY

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Jared M. Diamond, Ph.D., *Professor of Physiology.*

\* Not to be given every year.

George Eisenman, M.D., *Professor of Physiology.*

John Field, Ph.D., *Professor of Physiology and Medical History.*

Susumu Hagiwara, M.D., Ph.D., *Professor of Physiology.*

Glenn A. Langer, M.D., *Professor of Physiology and Medicine (Vice-Chairman of the Department).*

Donald B. Lindsley, Ph.D., *Professor of Physiology and Psychology.*

Wilfried F. H. M. Mommaerts, Ph.D., *Professor of Physiology and Medicine and Director of the Los Angeles County Heart Association Cardiovascular Research Laboratory (Chairman of the Department).*

Bernice M. Wenzel, Ph.D., *Professor of Physiology.*

Fred N. White, Ph.D., *Professor of Physiology.*

Morton I. Grossman, M.D., Ph.D., *Emeritus Professor of Physiology and Medicine.*

Victor E. Hall, M.D., *Emeritus Professor of Physiology.*

Allan Hemingway, Ph.D., *Emeritus Professor of Physiology.*

William D. Odell, M.D., Ph.D., *Professor of Medicine and Physiology in Residence.*

Daniel H. Simmons, M.D., Ph.D., *Professor of Medicine and Physiology.*

Ralph R. Sonnenschein, M.D., Ph.D., *Professor of Physiology (Vice-Chairman of the Department).*

Claude F. Baxter, Ph.D., *Associate Professor of Physiology in Residence.*

Jennifer S. Buchwald, Ph.D., *Associate Professor of Physiology in Residence.*

Gordon Ross, M.D., *Associate Professor of Physiology and Medicine.*

Donald O. Walter, Ph.D., *Associate Professor of Anatomy in Residence.*

Henry L. Batsel, Ph.D., *Assistant Professor of Physiology in Residence.*

Robert F. Eisenberg, Ph.D., *Assistant Professor of Physiology.*

Dennis Hafemann, Ph.D., *Assistant Professor of Physiology in Residence.*

Douglas June, Ph.D., *Assistant Professor of Oral Biology and Physiology.*

Eduardo Rubinstein, M.D., Ph.D., *Assistant Professor of Physiology in Residence.*

Marianne Schlaefke, M.D., Ph.D., *Assistant Professor of Physiology in Residence.*

John M. Tormey, M.D., *Assistant Professor of Physiology.*

Ernest M. Wright, Ph.D., *Assistant Professor of Physiology.*



Sigmund T. Rich, D.V.M., *Lecturer in Physiology.*

#### **Admission to Graduate Status**

Candidates for admission to graduate status in the Department of Physiology must conform to the general admission requirements set by the Graduate Division and have received the bachelor's degree in a biological or physical science or in the premedical curriculum. Candidates must also submit to the Department the scores achieved on the Graduate Record Examination (both the Aptitude Test and the Advanced Test). In general, at the time of admission, students must have completed courses in mathematics through calculus (equivalent to Mathematics 3A, B, C) and physical chemistry (equivalent to Chemistry 110A and 110B). Generally, ideal course preparation for graduate study in the Department should also include 12 quarter units of physics, 16 quarter units of chemistry (including quantitative analysis and organic chemistry), and 16 quarter units

of biology or zoology (including comparative vertebrate anatomy). In certain cases, at the discretion of the Department, students lacking some of this preparation but with a strong background in areas pertinent to physiology may be admitted to graduate status, provided that essential deficiencies are removed by appropriate courses within a specified time after admission.

Students may also be admitted upon the recommendation and sponsorship of staff members, subject to admission committee approval.

#### **Master of Science Degree**

Students entering graduate study in the Department of Physiology will normally be expected to pursue the Ph.D. degree. Exceptional cases may be considered for the Master of Science Degree. In those cases, candidates for the M.S. degree must meet the general

requirements set by the Graduate Division for this degree (pages 153-154). The candidate may elect either the Thesis Plan or the Comprehensive Examination Plan as set forth in the general section on "Requirements for the Master's Degree." Departmental requirements will be tailored to suit the special situation of the candidate.

#### Requirements for the Doctor's Degree

**General University Requirements.** Candidates for the doctorate in physiology must conform to the general requirements set by the Graduate Division for this degree (page 156).

**Departmental Requirements.** Three routes to the Ph.D. degree exist in this Department, involving specialization in: (a) membrane and cellular physiology; (b) maintenance physiology (i.e., the physiology of the cardiovascular, respiratory, digestive, endocrine, and excretory systems); and (c) neurophysiology. For routes (a) and (b), the requirements ordinarily are: (1) Physiology 200 (Introduction); (2) Physiology 101 (Neuromuscular, Cardiovascular and Respiratory Physiology); (3) Physiology 102 (Renal, Gastrointestinal and Metabolic Physiology); (4) Physiology 221, 222, 223 (Graduate Commentary); (5) Biological Chemistry 101A, 101B, and 101C or Chemistry 153 (Biochemistry); (6) Anatomy 101 (Microscopic Anatomy) or Zoology 111 (Functional Ultrastructure of Cells); (7) a course in statistical methods. For students in neurophysiology (c) the course of study is similar except that Physiology 200, 221 and 222 (which require physical chemistry as a prerequisite) are optional if the student's emphasis in neurophysiology is not cellular. In the latter case, additional course requirements will depend on the area of study and will be recommended by the student's adviser.

Following the completion of all essential course work students will take the departmental written and oral examinations. When these are successfully completed, students may advance to candidacy by successful completion of the University qualifying examination administered by the student's graduate committee.

**Foreign Language Requirement.** No foreign languages are required for the completion of the Ph.D. or M.S. degree. The time usually ascribed to language studies will be devoted to a more detailed preparation in physical sciences and mathematics.

**Student's Responsibilities.** Prospective candidates for the doctor's degree are responsible for completion of all technical requirements for this degree. Careful study should be made of the requirements set by the Graduate Division (see pages 156-160).

#### Upper Division Courses

#### 100. Elements of Human Physiology. (1½ courses)

Prerequisite: enrollment in School of Dentistry or consent of the instructor. Required course for first-year dental students. Lectures, laboratories, and demonstration—discussions concerning functional activities of the living body in terms of both cellular and systemic functions. Examples will be presented, where possible, on the basis of information relevant to oral function. Mr. Ross and Staff

#### 101. Neuromuscular, Cardiovascular and Respiratory Physiology. (1¾ courses)

Prerequisites: basic courses in chemistry, physics, and either biology or zoology, at least one year each; organic chemistry; a course in microscopic anatomy; and a course in gross anatomy, human or comparative. Primarily for first year medical students, but open to other students with consent of the instructor. Lectures, laboratory and conferences. An analysis of excitation and excitation transfer in muscle and nerve, the contractility of muscle and the heart, the cardiovascular system, and the physiology of respiration. Mr. Sonnenschein and Staff

#### 102. Renal, Gastrointestinal and Metabolic Physiology. (1¾ courses)

Prerequisites: same as for course 101. Primarily for first year medical students but open to other students with consent of the instructor, Lectures, laboratory and conferences. A continuation of course 101, dealing with the digestion of substances, and the distribution of water, electrolytes and metabolites by the renal and gastrointestinal systems, and the special physiology of certain organs. Mr. Sonnenschein and Staff

#### 103. Basic Neurology.

Prerequisites: same as for course 101. A survey of the structure and function of the receptors, peripheral and central nervous system. Must be taken concurrently with Anatomy 103. Enrollment limited to medical students. Mrs. Buchwald

#### 105N. Elementary Physiology. (1 course)

Prerequisite: Enrollment limited to juniors or seniors in nursing or consent of instructor. Lecture and discussion emphasizing a correlative approach to anatomy and physiology of the human body. No other course offers human anatomy and physiology which is essential for a complete nursing education. Mr. Cleworth

#### 199. Special Studies. (¼ to 2 courses)

Prerequisite: consent of the instructor. Special studies in physiology, including either reading assignments or laboratory work or both, designed for appropriate training of each student who registers in this course. The Staff

#### Graduate Courses

#### 200. Introduction to General Physiology. (¾ course)

Prerequisite: consent of the instructor. A survey of certain aspects of cellular and molecular physiology essential to the understanding of the function of

organs. The topics to be considered include biological energetics, electrolyte distribution, transport through membranes, and the colloidal state in biological systems.  
Mr. Wright

### 201. Physiological Methods. (½ course)

Prerequisite: consent of the instructor. Lectures and demonstrations concerning the theory and operation of modern instruments for cardiovascular and respiratory research.  
Mr. Assali

### 202. Permeability of Biological Membranes. (½ course)

Prerequisites: Chemistry 113B and 113C or the equivalent. Topics include: the physical basis of discrimination among similar ions; the physical basis of discrimination among non-electrolytes; ion and non electrolyte permeation mechanisms.  
Mr. Diamond

### 203. Neurophysiology.

Prerequisites: Same as for course 101. A survey of the physiology of sensory receptors and the peripheral and central nervous system.  
The Staff

### 204. Cardiovascular Physiology. (½ course)

Prerequisite: course 101 and consent of the instructor. Advanced consideration of special topics in the physiology of the circulatory system.  
Mr. Sonneschein, Mr. White

### 207A. Neurophysiology.

Prerequisite: course 103 or its equivalent. The electrical activity of nervous tissue and its relation to the basic organization of sensory, motor, integrative, and regulatory systems of the brain. The Staff

### 207B. Neurophysiology.

Prerequisite: consent of the instructor. Seminar and laboratory course designed to acquaint the student with behavioral techniques and concepts relevant to research problems encountered in modern neurophysiology, and to consider means of integrating them with neurophysiological methods.  
Miss Wenzel

### 208. Theoretical Physiology. (½ course)

Prerequisite: consent of the instructor. A series of seminar-discussions concerning various theoretical and philosophical problems facing physiologists.  
The Staff

### 209A. Mathematical Modeling of Physiological Systems.

Prerequisite: consent of the instructor. Mathematical analysis and modeling of physiological systems, with emphasis on applications of linear systems theory to problems in cardiovascular, respiratory, and cellular physiology.  
Mr. Walter

### 209B. Mathematical Modeling of Physiological Systems. (¾ course)

Prerequisite: consent of the instructor. Mathematical analysis of neuronal systems, with emphasis on stochastic models of nervous activity. Mr. Walter

### 210. Advanced Endocrinology. (½ course)

Prerequisites: courses 101, 102; Biological Chemistry 101A-101B-101C. A consideration of recent advances in endocrinology. Biosynthesis, secretion, transport, action, metabolism and excretion of each of the hormones. Major emphasis on basic concepts of endocrine physiology with lesser emphasis on pathophysiology.  
Mr. Odell

### 212. Critical Topics in Physiology. (¼ to 1 course)

Prerequisite: consent of the instructor. Advanced treatment of critical topics in physiology by staff and guest lecturers for graduate and postdoctoral students in the biomedical sciences.  
The Staff

### 213. Linear Analysis of Living Systems. (2 courses)

Prerequisite: consent of the instructor. This course will show that the Laplace transform permits the transient response of linear systems to be analyzed almost as easily as their steady-state response. The electrical properties of cells, and of idealized feedback systems will then be discussed.

### 221. Graduate Commentary on Physiology of the Cardiovascular System and of Contraction and Excitation. (½ course)

Prerequisites: same as for course 101. For graduate students. An advanced supplementation of the topics being presented in course 101.  
Mr. Mommaerts and Staff

### 222. Graduate Commentary on Digestive, Renal, and Metabolic Physiology. (½ course)

Prerequisite: course 101. For graduate students. An advanced supplementation of the topics being presented in course 102. Mr. Mommaerts and Staff

### 223. Graduate Commentary on the Physiology of the Nervous System. (½ course)

Prerequisites: same as for course 101. For graduate students. An advanced supplementation of the topics being presented in basic neurology.  
Mr. Mommaerts and Staff

### 224. Physiology of Nerve Cells. (½ course)

Prerequisite: Background of physical chemistry; consent of instructor. Electrical properties of the membrane during excitation and synaptic transmission in nerve cells. Mr. Eisenberg, Mr. Hagiwara

### 225. Molecular Mechanisms of Membrane Ion Permeation (1 course)

Prerequisite: Consent of the instructor. Advanced lectures and laboratory seminars on the present knowledge of the molecular mechanisms for ion permeation in well defined model systems, status of current research, and projections for future developments. Mr. Eisenman, Mr. McLaughlin, Mr. Szabo

### 231. Principles of Animal Experimentation. (½ course)

Prerequisite: consent of the instructor. Principles and concepts of animal experimentation. Emphasis on selecting and utilizing the animal as a biological instrument, comparative and unique physiologic characteristics, and the identification of variables which affect experimental data.  
Mr. Rich

### 251A-251B-251C. Seminar in Physiology. (¼ course each)

Prerequisite: consent of the instructor. Review and discussion of current physiological literature, research in progress, and special topics.  
The Staff

### 252A-252B-252C. Cardiorespiratory Seminar. (¼ course each)

Prerequisite: consent of the instructor. Weekly discussion of cardiovascular and respiratory problems, including review of current literature, research in progress, and special topics.  
The Staff

**255. Seminar in the History of Physiology.**

(½ course)

Prerequisites: courses 101, 102, 103 (or Anatomy 206). The consideration in detail of several selected topics in the history of physiology. Each student will present one or more topics to the seminar.

Mr. Amacher

Individual Study and Research

**596. Directed Individual Study or Research.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**597. Preparation for the Master's Comprehensive Examination or the Doctoral Qualifying Examination. (½ to 2 courses)**

Prerequisite: consent of the instructor. The Staff

**598. Thesis Research for Master's Candidates.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**599. Dissertation Research for Ph.D. Candidates.**

(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

**PLANETARY AND SPACE SCIENCE**

(Department Office, 3684 Geology Building)

\*\*Robert E. Holzer, Ph.D., *Professor of Geophysics.*\*\*William M. Kaula, M.S., *Professor of Geophysics (Vice-Chairman of the Department).*\*\*Leon Knopoff, Ph.D., *Professor of Geophysics and Physics.*\*\*Clarence E. Palmer, D.Sc., *Professor of Geophysics.*\*\*George W. Wetherill, Ph.D., *Professor of Geophysics and and Geology (Chairman of Department).*Friedrich H. Busse, Ph.D., *Associate Professor of Planetary Physics.*\*\*Paul J. Coleman, Jr., Ph.D., *Associate Professor of Planetary Physics.*\*\*David D. Jackson, Ph.D., *Assistant Professor of Planetary Physics in Residence.*Hugh H. Kieffer, Ph.D., *Assistant Professor of Planetary Physics.*\*\*Robert Z. McPherron, Ph.D., *Assistant Professor of Planetary Physics and Geophysics.*Alan C. Newell, Ph.D., *Assistant Professor of Mathematics and Planetary Physics.*Gerald Schubert, Ph.D., *Assistant Professor of Planetary Physics.*Thomas A. Farley, Ph.D., *Lecturer in Planetary Physics.*Durward D. Skiles, Ph.D., *Acting Assistant Professor of Planetary Physics.*Lawrence H. Aller, Ph.D., *Professor of Astronomy.*\*\*David T. Griggs, M.A., *Professor of Geophysics.*\*\*George C. Kennedy, Ph.D., *Professor of Geochemistry and Geology.*\*\*Willard F. Libby, Ph.D., *Professor of Chemistry.***Admission to Graduate Status**

Students entering the Department should have bachelor's or master's degrees in physics, mathematics, or astronomy, or in a few cases, degrees in geophysics, chemistry, engineering, geology or meteorology with a strong emphasis on appropriate courses in physics and mathematics.

**Program of Study**

The program of study is designed to provide students with a firm background in physics and mathematics, together with basic knowledge in one or more fields of concen-

tration. Appropriate fields of concentration are: physics of planetary interiors, including magnetic and gravitational fields; geophysical fluid dynamics, including nonlinear wave phenomena and turbulence; physics of the upper atmosphere, including ionospheric physics and the physics of the radiation belts; physics of the interplanetary medium, including the solar wind and magnetic fields; and planetary and orbital dynamics, with emphasis on the structure and evolution of the solar system. The program for the individual student will be developed through consultation with the graduate adviser.

\*\* Member of the Institute of Geophysics and Planetary Physics.

**Requirements for the Degree of Master of Science**

For general University requirements see pages 153-154.

**Prescribed Courses.** The University requires nine courses for the M.S. Degree. The Department requires a minimum of five courses in the 200 series, no less than half of which are in the student's field of specialization. The remaining courses must include Planetary and Space Science 200A-200B-200C and may include additional 100 series courses approved by the student's graduate adviser.

**Examination or Thesis.** The candidate must either (1) write a thesis to be approved by a committee of at least three faculty members; or (2) pass a written comprehensive examination offered at the end of each quarter. The examination must be taken not later than the eighth quarter of residence.

**Residence Requirements.** The minimum residence requirement is three quarters.

**Requirements for the Degree of Doctor of****Philosophy**

For the general University requirements, see pages 156-160.

Each student seeking candidacy for a Ph.D. degree will be required to meet the following departmental requirements. (1) Final examinations in at least three of the four fundamental physics courses: Physics 210A, Physics 215A, Planetary and Space Science 201 (or Physics 220A), Planetary and Space Science 202. It is also recommended that first-year graduate students take the fundamental course in planetary and space physics, 200A-200B-200C. (2) The comprehensive written examination of the Department of Planetary and Space Science. (3) Upon completion of (2) the student may arrange for a preliminary oral examination, which will be mainly on the major field of concentration.

Each student seeking a Ph.D. degree is required to fulfill the following University requirements: (1) the foreign language requirement as follows: a minimum score of 500 in the Educational Testing Service examination in one of either Russian or German, or completion of course 5, or five quarters of study, or its equivalent in one of either Russian or German with a minimum grade of B in each course; those students whose native tongue is not English will also be expected to meet this requirement; (2) a qualifying oral examination; (3) a dissertation

on a subject chosen by the candidate with the approval of his doctoral committee; (4) a final oral examination conducted by the doctoral committee.

**Upper Division Courses****101. Introduction to Planetary and Space Physics.**

**Prerequisites:** Physics 7A-7B-7C-7D and Mathematics 11A-11B-11C, or their equivalents. A survey of geophysics, the physics of the planets, their atmospheres, and the interplanetary medium, with emphasis on topics of current research interest. The course is designed primarily for students majoring in a physical science or mathematics. **The Staff**

**199. Special Studies in Planetary and Space Physics. (½ to 2 courses)**

**Prerequisites:** any two of Physics 105A, Physics 110A, Physics 112A, Physics 131, or their equivalents. Directed individual study for upper division students majoring in a physical science or mathematics. **The Staff**

**Graduate Courses****200A. Fundamentals of Planetary and Space Physics 1: Solids: Planetary Interiors.**

The earth's interior: geology, gravity, seismology, heat flow; planetary magnetism; dynamics of the solar system; optical, thermal, and radio observations of planetary surfaces; meteorites and their chemistry; origin and evolution of the terrestrial planets. **Mr. Kashi**

**200B. Fundamentals of Planetary and Space Physics 2: Fluids: Oceans and Atmospheres.**

Origin, evolution, and structure of oceans and atmospheres. **Mr. Kieffer, Mr. Palmer**

**200C. Fundamentals of Planetary and Space Physics 3: Plasmas: Aeronomy and the Interplanetary Medium.**

Solar surface features, heating and expansion of corona, solar wind, plasma and magnetic fields, interaction of the solar wind with the earth, magnetospheric phenomena. **Mr. McPherron**

**201. Classical Mechanics.**

Kinematics, variational principles and Lagrange's equations, rigid body equations, Hamilton equations of motion, canonical transformations, Hamilton-Jacobi Theory, small oscillations, perturbation theory. **Mr. Knopoff**

**202. Physics of Continuous Media.**

Continuum derivation of conservation principles: Navier-Stokes stress formulation and Fourier heat conduction, approximations to the equations (dimensionless parameters). Microscopic derivation of conservation principles: Boltzmann's equation, moment equations, Chapman-Enskog expansion technique, low temperature approximation, Chew, Goldberger, and Low approximation **Mr. Schubert**

**210. Stability Theory.**

Studies in laminar fluid dynamics: characteristic value problems of shear flow and thermal convection; variational estimation techniques; finite-amplitude

theories of post-instability flow and finite-amplitude instabilities; gyroscopic constraints due to rotation and magnetic fields; boundary layer theory.

Mr. Busse

#### 214. Geophysical Fluid Dynamics.

Prerequisite: consent of the instructor. Fluid processes relevant in geo- and astrophysical situations. Topics include: wave propagation, shocks, bores; Ekman and Hartmann boundary layers; formulation of description for irregular flows.

Mr. Newell

#### 218. Statistical Hydrodynamics.

(Same as Geophysics 241.) An introduction to the nonlinear fluid processes of planetary physics: aperiodic motion and statistical stability; similarity theory: upper bounds for the turbulent transport of heat and momentum; mean field equations; quantitative theories of turbulent flow; the problem of statistical closure.

Mr. Busse

#### 220A. Planetary and Orbital Dynamics 1.

Theory of rotating fluids; external gravitational fields of a planet; analysis of gravity anomalies; effects of the gravitational field on a close satellite orbit and determination of the field from orbital perturbations.

Mr. Kaula

#### 220B. Planetary and Orbital Dynamics 2.

Gravitational, mechanical and thermal aspects of planetary interiors; dynamics of the earth-moon system; variations in rotation, tidal friction; dynamics of the solar system: energy dissipating effects, spin-orbit couplings.

Mr. Kaula

#### 222. Introduction to Seismology.

Types of seismic waves; travel-time seismology; epicenter location; amplitude variations; seismograph theory; explosion seismology; seismicity; focal conditions; surface wave analysis; microseisms and tsunamis.

Mr. Knopoff

#### 224A. Theoretical Seismology.

(Same as Engineering 258C.) Prerequisite: consent of the instructor. Elastic wave equations and elementary solutions; wave motions in elastic half-spaces; reflection and refraction of elastic waves; surface waves; vibration of rods and plates.

Mr. Knopoff, Mr. Mal

#### 224B. Theoretical Seismology.

(Same as Engineering 258D.) Prerequisite: course 224A. Elastic waves in layered media; Green's functions for various geometries; scattering and diffraction of elastic waves; attenuation; inversion problems.

Mr. Knopoff, Mr. Mal

#### 225A. Physics and Chemistry of Planetary Interiors 1.

Origin, age, and chemical composition of the earth and planets; close-packed silicate structures and mineralogy of planetary interiors; heat flow, thermal state and thermal history of the earth and planets, models of planetary interiors. Mr. Wetherill

#### 225B. Physics and Chemistry of Planetary Interiors 2.

Major movements in the earth. Earthquakes. Seismology and interior structure of the earth. Density and elastic parameters in the interior. Nonelastic pressures in the interior. Convection and continental drift.

Mr. Knopoff

#### 228A. Magnetic Fields of the Earth and Planets 1.

Observations of the earth's magnetic field: spherical harmonic analysis, time-varying quantities; analysis of the field in terms of components of internal and external origins; macroscopic equations governing the behavior of a conducting fluid.

Mr. Coleman

#### 228B. Magnetic Fields of the Earth and Planets 2.

Magneto-hydrostatic equilibrium; thermal generation of planetary magnetic fields; dynamo mechanisms; possible sources of energy, including precessional torques; consideration of fields on other planets and the sun.

Mr. Coleman

#### 230. Planetary Surfaces and Atmospheres.

Prerequisite: course 200A, 200B. Advanced study of planetary observations. Techniques of planetary astronomy; interpretation of visible and infrared observations; spectroscopy; observations from spacecraft; interaction of surface and atmosphere. Current observations and theories will be critically discussed.

Mr. Kieffer

#### 250A-250B. Dynamics of the Solar Wind.

(Same as Meteorology 250AB.) Prerequisite: course 202 or consent of the instructor. Topics to include Parker's hydrodynamic solution and spiral magnetic field model, dynamical effects of magnetic field and solar rotation, angular momentum flux, shock waves, discontinuities, small amplitude wave propagation, and nonradial flow components.

Mr. Schubert, Mr. Siscoe

#### 260A. Topics in Magnetospheric Plasma Physics.

Research problems in the theory of magnetic storms.

Mr. McPherron

#### 260B. The Origin and Propagation of Plasma Waves in Space; Wave Particle Interactions.

Special problems associated with the magnetosphere, magnetosheaths and interplanetary medium.

Mr. Holzer

#### 265. Experimental Techniques in Space Physics.

Design criteria and environmental requirements for spacecraft experiments; photomultipliers and semiconductor diodes for charged particle detection; fluxgates, search coils, and resonance devices for magnetic field measurements; plasma probes; micro-meteorite detectors; special laboratory techniques for checkout and calibration of space experiments; use of necessary general-purpose instrumentation.

Mr. Farley

#### 282. Seminar in Hydromagnetics.

Topics from the continuum theory; Alfvén waves in bounded regions; the dynamo problem; the role of the magnetic field as an inhibitor and instigator of fluid instability; theories of the solar magnetic fields; theories of geomagnetism.

Mr. Skiles

#### 285. Seminar on the Origin of the Solar System.

(Same as Astronomy 285.) Dynamical problems of the solar system; chemical evidences from geochemistry, meteorites, and the solar atmosphere; nucleosynthesis; formation of the solar nebula; solar contraction; hydromagnetic processes in the nebulae, condensation of the planets; origin of satellite systems.

The Staff

#### 287. Seminar in Seismology.

Problems of current interest in seismology.

Mr. Knopoff



**289A-289B-289C. Seminar in Fluid Dynamics.**

Research in fluid dynamics with emphasis on geophysical applications, including stability theory, turbulence, and magnetohydrodynamics.

Mr. Newell

**Individual Study and Research**

Courses in the 500 series may be applied in place of 200-level courses toward the requirements for the master's degree *except* for the minimum number required in a field of specialization. Letter grades will be given in 596; courses 597 and 599 will be taken on a satisfactory/unsatisfactory basis.

**596. Research in Planetary and Space Science.**

(½ to 3 courses)

Prerequisite: consent of the faculty graduate adviser. Directed individual study or research in: experimental and theoretical work on magnetic fields, energetic particles and plasmas in space (Mr. Holzer, Mr. Coleman, Mr. Farley, Mr. McPherron); hydrodynamics and hydromagnetism (Mr. Schubert, Mr. Busse, Mr. Skiles); orbital dynamics and planetary mechanics (Mr. Kaula); seismology and the earth's interior (Mr. Jackson, Mr. Knopoff); geochronology and meteorites (Mr. Wetherill); climatology (Mr. Palmer); planetary spectra (Mr. Kieffer).

**597. Preparation in Planetary and Space Science for Comprehensive Field Examinations.**

(½ to 1 course)

Prerequisite: consent of faculty graduate adviser. Review of fundamental course 200A-200B-200C in preparation for the written comprehensive examination for the master's degree, or study and research in the area selected for a possible dissertation topic prior to the Ph.D. qualifying examination. The Staff

**598. Research for and Preparation of the Master's Thesis. (½ to 3 courses)**

Research for and preparation of the master's thesis in Planetary and Space Physics. The Staff

**599. Research for and Preparation of the Doctoral Dissertation in Planetary and Space Physics. (½ to 3 courses)**

Research for and preparation of the doctoral dissertation in planetary and space physics. The Staff

**Related Courses in Other Departments****Providing Fundamental Techniques**

Engineering 260A-260B. Celestial Mechanics.

Mathematics 272B-272C. Fluid Mechanics.

Physics 210A-210B. Electromagnetic Theory. 215A. Thermodynamics.

220A. Foundations of Classical and Quantum Mechanics.

220B. Mechanics of Continuous Media.

221A-221B. Quantum Mechanics.

222A-222B-222C. Plasma Physics.

231A-231B-231C. Methods of Mathematical Physics.

**Pertaining to the Natural Environment**

Astronomy 201A-201B-201C. Astrophysics of the Solar System.

Geology 200. Geology Colloquium.

Geophysics 131. Geochemistry.

Meteorology 240. Atmospheric Wave Phenomena.

246. Physics of the Ionosphere.

247A-247B. Non-Thermal Radiation Processes.

248. Dynamics of the Magnetosphere.

249A-249B-249C. Plasma Phenomena in the Earth's Environment.

**PLANT SCIENCE**

See Department of Botanical Sciences.

**POLITICAL SCIENCE**

(Department Office, 4289 Bunche Hall)

Hans H. Baerwald, Ph.D., *Professor of Political Science.*

Irving Bernstein, Ph.D., *Professor of Political Science.*

John C. Bollens, Ph.D., *Professor of Political Science.*

Bernard Brodie, Ph.D., *Professor of Political Science.*

David T. Cattell, Ph.D., *Professor of Political Science.*

Winston W. Crouch, Ph.D., *Professor of Political Science.*

Ernest A. Engelbert, M.P.A., Ph.D., *Professor of Political Science.*

†Malcolm H. Kerr, Ph.D., *Professor of Political Science.*

Richard P. Longaker, Ph.D., *Professor of Political Science.*

Dwaine Marvick, Ph.D., *Professor of Political Science.*

Charles R. Nixon, Ph.D., *Professor of Political Science.*

Harry M. Scoble, Ph.D., *Professor of Political Science.*

† Absent on leave, 1970-1971.

- Foster H. Sherwood, Ph.D., LL.D., *Professor of Political Science.*  
 Richard L. Sklar, Ph.D., *Professor of Political Science.*  
 H. Arthur Steiner, Ph.D., *Professor of Political Science.*  
 David A. Wilson, Ph.D., *Professor of Political Science.*  
 Charles E. Young, Ph.D., *Professor of Political Science.*  
 J. A. C. Grant, Ph.D., LL.D., *Emeritus Professor of Political Science.*  
 David G. Farrelly, Ph.D., *Associate Professor of Political Science.*  
 Robert C. Fried, Ph.D., *Associate Professor of Political Science.*  
 William P. Gerberding, Ph.D., *Associate Professor of Political Science (Chairman).*  
 †Andrzej Korbonski, Ph.D., *Associate Professor of Political Science.*  
 Michael F. Lofchie, Ph.D., *Professor of Political Science.*  
 David C. Rapoport, Ph.D., *Associate Professor of Political Science.*  
 John C. Ries, Ph.D., *Associate Professor of Political Science.*  
 David O. Sears, Ph.D., *Associate Professor of Political Science and Psychology.*  
 †David O. Wilkinson, Ph.D., *Associate Professor of Political Science.*  
 Ciro Zoppo, Ph.D., *Associate Professor of Political Science.*  
 Richard E. Ashcraft, Ph.D., *Assistant Professor of Political Science.*  
 Richard D. Baum, Ph.D., *Assistant Professor of Political Science.*  
 L. Blair Campbell, Ph.D., *Assistant Professor of Political Science.*  
 Louis J. Cantori, Ph.D., *Assistant Professor of Political Science.*  
 Robert S. Gerstein, Ph.D., *Assistant Professor of Political Science.*  
 Edward Gonzalez, Ph.D., *Assistant Professor of Political Science.*  
 Douglas S. Hobbs, Ph.D., *Assistant Professor of Political Science.*  
 Susan B. Kaufman, Ph.D., *Assistant Professor of Political Science.*  
 Francine Rabinovitz, Ph.D., *Assistant Professor of Political Science.*  
 Simon H. Serfaty, Ph.D., *Assistant Professor of Political Science.*  
 John R. Sisson, Ph.D., *Assistant Professor of Political Science.*  
 Duane E. Smith, Ph.D., *Assistant Professor of Political Science.*  
 Leo M. Snowiss, Ph.D., *Assistant Professor of Political Science.*  
 Steven L. Spiegel, Ph.D., *Assistant Professor of Political Science.*  
 E. Victor Wolfenstein, Ph.D., *Assistant Professor of Political Science.*  
 ———, *Assistant Professor of Political Science.*  
 ———, *Assistant Professor of Political Science.*  
 ———, *Assistant Professor of Political Science.*  
 ———, *Assistant Professor of Political Science.*
- ◊
- Rupert Emerson, Ph.D., *Visiting Professor of Political Science.*  
 Leonard Freedman, Ph.D., *Lecturer in Political Science.*  
 Paul J. Halpern, M.A., *Acting Assistant Professor of Political Science.*  
 Carl P. Hensler, B.S.M.E., *Acting Assistant Professor of Political Science.*  
 Marvin Hoffenberg, M.A., *Lecturer in Political Science.*  
 Anthony D. Martin, M.A., *Acting Assistant Professor of Political Science.*  
 Karen J. Orren, M.A., *Acting Assistant Professor of Political Science.*

### Preparation for the Major

#### Course 1.

#### The Major

Nine upper division political science courses (for a total of 36 units) numbered from 110 to 199, and four upper division courses in one or more of the following social

sciences: Anthropology, Business Administration (only 150, 180, 190), Economics, Geography, History, Psychology (except 115, 116, 117), Sociology. All of these classes (a minimum of 13) must be taken for grades (not pass-fail).

Upper division courses are organized into six groups, each including "core" courses

† Absent on leave, 1970–1971.

designed to expose the student to material of fundamental importance. All students majoring in the Department must take (1) Political Science 110, Early Modern Political Theory, (2) a core course in either Group II (International Relations) or Group IV (Comparative Government), (3) a core course in each of two additional groups (II, III, IV, V, VI), and (4) in any one of the four groups, as a major field of interest, two additional courses. Courses 197, and 199 are not applicable to fulfillment of group distribution requirements. In Group II (International Relations) only one of the defense studies courses, 138A, B, C, may be counted toward group distribution requirements.

Group distribution requirements will thus account for six courses: one core course in each of four fields, plus two other courses in one of those fields. The remaining units needed to reach the required total of nine courses (36 units) may be chosen at large from the offerings of the Department. The core courses are as follows: Group I (Political Theory), course 110; Group II (International Relations), courses 120, 121; Group III (Politics), courses 141, 145; Group IV (Comparative Government), course 150; Group V (Public Law), courses 170, 171; Group VI (Public Administration and Local Government), courses 180, 181.

Core courses are not prerequisites for other courses in the group, but students majoring in the Department will ordinarily give priority to completing core course requirements during their junior year. Core courses are open to sophomores as well as upper division students, and students expecting to major in political science are encouraged to take one core course during the sophomore year.

*The Honors Program.* Students wishing to qualify for graduation with honors (see catalog description of "Honors with the Bachelor's Degree" under section entitled "College of Letters and Science") should enroll in one honors proseminar, listed as Political Science 197, in two quarters of their senior year. In addition, the student must meet the grade-point average requirements prescribed by the College of Letters and Science. Third-quarter juniors may apply for enrollment if unusual scheduling problems so warrant. At least four (16 units) upper division courses in political science, and a 3.0 overall grade-point average, are required for enrollment.

Several proseminars will be offered each quarter. Each proseminar will be devoted

to a selected theme suitable for individual research and group discussion, not necessarily confined to any one of the six departmental fields. The name of the instructor and the subject of each proseminar will be announced in the preceding quarter. Application for enrollment must be made at the Department office before the last day of instruction of the preceding quarter.

*Related Curricula.* For the curricula in international relations and public service, see pages 73-74 and 78 or this bulletin.

For those students of politics who wish to acquire for future professional use a background in modern quantitative methods of data generation, handling and analysis, an information sheet is available in the undergraduate adviser's office.

#### Admission to Graduate Status

Students wishing to enroll in graduate studies in the Department of Political Science should be aware of the two parts involved in their application: One, UCLA Graduate Division requirements, and two, Departmental requirements.

Applications for the fall quarter must be received by the Graduate Division by January 15 at the time fellowship and Teaching Assistant applications are due. Applications for winter and spring quarters must be received by the Graduate Division by October 15.

*Graduate Division.* See pages 29-31 of this catalog or the UCLA announcement of the Graduate Division.

*Department of Political Science.* The Department ordinarily requires a minimum grade point average of 3.0; two letters of recommendation; and test scores from the Graduate Record Examination (the Aptitude Test and the Advanced Government Test); (The Law School Aptitude Test may be used in place of the G.R.E.). Application forms are available from the Graduate Division and recommendation forms from the Department of Political Science. Completed applications should be submitted to the Graduate Division and the recommendations and the Graduate Record Examination or the Law School Aptitude Test should be sent directly to the Graduate Adviser, Department of Political Science.

The Aptitude Test and the Advanced Government Test of the Graduate Record Examination are given four times a year in various locations in the United States and foreign countries. Applications may be secured by applying to the Educational Testing Service,

1947 Center Street, Berkeley, California 94704, (for those living in the West) and to Educational Testing Service, 20 Nassau Street, Princeton, New Jersey 08540 (for those living in the East).

An undergraduate major in Political Science is desirable but not mandatory.

#### Graduate Fields of Study

Six fields of study are offered to graduate students in the Political Science Department: *Political Theory; International Relations; Politics; Comparative Government; Public Law; Public Administration and Local Government.*

Normally candidates for the M.A. degree are given a written examination within one year and a half after date of entry, chosen from the six basic fields listed above. Candidates for the Ph.D. degree are examined in three fields, two of which must be within the six fields offered by the Department.

Ph.D. candidates may take one of their three fields outside the Department with the approval of the Department. It should be noted that outside fields are not permitted for the M.A. degree program.

In addition to a series of introductory courses on problems of political inquiry (courses 203A-203C), the Department offers three types of graduate courses in each of six fields of study.

1. The 210 series of general courses.
2. The 220 through 240 series of specialized substantive courses.
3. The 250 through 270 series of seminars. Seminars will ordinarily be taken by advanced graduate students.

In addition, the Department offers the 401 course, Internship in Public Service, for M.P.A. candidates, and the 590 series of individual study and research courses. The 590 courses are designed primarily for graduate students on a limited basis.

#### The M.A. Program

The Department normally operates under the Comprehensive Examination Plan (a one-field examination and overall evaluation), although the Thesis Plan may be followed in rare cases with the approval of the Department.

*One foreign language (or a research-tool substitute program) and nine quarter courses taken while the student is in graduate status are required for M.A. degree.* A student will take a minimum of five (5) graduate courses, distributed among three (3) fields of study offered in the Department of Political Sci-

ence. The 203A-203B sequence may be substituted for one of the three fields. The remaining four courses may be chosen by the student at his discretion, in or out of the Political Science Department. Lower division courses, however, do not count toward meeting this requirement. The 500 series courses will not normally meet this five course requirement. Exceptions will be considered on petition to the Graduate Studies Committee. During the first three quarters in residence a candidate must normally complete a minimum of seven courses.

*The language requirement must be met within the first five quarters in residence, or further graduate work will not be permitted until the requirement is satisfied.* All prospective graduate students are strongly urged to prepare for their language requirement before beginning the first quarter of graduate work.

For the master's degree, all students will be required *either* to pass one foreign language reading examination (*at the "standard" level of performance, passing the E.T.S. examination with a score of 500 or above*) or to fulfill the requirements for a research tool substitute program, such program to be approved in each case by a member of the faculty and the Department's Graduate Studies Committee. Languages must be approved by the Department's Graduate Studies Committee.

Foreign language requirements fulfilled at other institutions by students entering with a master's degree may or may not be accepted. Such cases will be acted upon by the Graduate Studies Committee.

Foreign students for whom English was the language of instruction in secondary school may not offer English as a foreign language. Such students may offer their native language as a foreign language if (1) they demonstrate by examination a fluency in their native language *and* (2) the Graduate Committee accepts the language as one in which academic research is likely to be pursued by these students.

*Full-time Program.* Students are encouraged to carry a full time program which consists of two or three full courses per quarter.

*Graduate Work at Other Campuses of the University of California.* Work completed while in graduate standing on other campuses of the University of California may be used to satisfy part of the total course requirement; up to four courses may be transferred toward the nine courses required for the M.A.

Two graduate courses completed at another U.C. campus may be used toward the requirement of five graduate courses.

**Graduate Work Completed Elsewhere.** With the approval of the Department and the Graduate Division, credit for a maximum of two quarter courses completed at another institution (other than a U.C. campus) can be applied toward the nine course requisite for the M.A.

Extension courses are not accepted by the Department for graduate work.

**Examination Sequence.** At the end of the third quarter in residence a committee of the faculty normally meets with the student to discuss and evaluate his progress and qualifications as a potential M.A. and Ph.D. candidate.

The M.A. comprehensive examinations are given twice a year: near the end of the fall quarter, and near the end of the spring quarter. Candidates for the M.A. degree are required to complete the M.A. comprehensive examination within one year and a half of the date of entry into the M.A. degree program. Exceptions to this rule will be granted only in extraordinary cases. Students who fail to take the examination at the appointed time will be subject to termination as candidates for a degree in this Department. The written examination is in one of the six fields. The examining committee makes an overall evaluation of the student's capabilities and qualifications, based on the written examination, grades and the confidential faculty reports. The examining committee may in addition give the student an oral examination. The examining committee then recommends one of the following: (1) That the student receive the M.A. degree (when all departmental and University requirements are met) and be encouraged to proceed toward the Ph.D. (2) That the student receive the M.A. degree (when all departmental and University requirements are met) and that his status as a graduate student in the Department be thereafter terminated. (3) That the student not be awarded the M.A. degree and that his status as a graduate student in the Department be terminated. *Candidates are allowed to take the M.A. examinations one time only.*

#### The Ph.D. Program

An M.A. in Political Science or the equivalent is a prerequisite. A student entering with an M.A. from another university must pass the M.A. screening examinations during his

first year in residence, before he can be considered a Ph.D. candidate in the Department.

**Foreign Language.** As one condition for advancement to candidacy for the doctorate, graduate students will—in addition to fulfilling the requirements for the M.A. degree—fulfill one of the following three requirements; (1) Pass a reading examination at the "standard" level of performance in a second foreign language (a score of 500 or above on the E.T.S. examination). (2) Pass an examination in the same foreign language offered for the master's degree at an "advanced" level of performance suitable for field research. This level and the manner of examination will be determined for each language by the Department of Political Science. Ordinarily passing at an "advanced" level consists of passing the E.T.S. examination with a score of 650, and demonstrating oral proficiency at a level equivalent to Foreign Service 3. (3) Fulfill the requirements for a research-tool substitute program, such program to be approved in each case by the Graduate Committee. This option may not be selected at both the master's and Ph.D. levels.

Each graduate student will be required to get the approval of his doctoral adviser regarding his choice among these three requirements.

**Course Requirements.** A student will take a minimum of fourteen (14) courses, including three (3) seminars, prior to taking the Ph.D. preliminary examinations. The nine courses taken in the M.A. program will be included in this total. A minimum of nine courses must be taken within the Department of Political Science. Of the fourteen required courses, a total of no more than five courses may be taken in the 500 series and at the undergraduate level. No more than two 500 series courses may be taken with the same Political Science professor. Students may not fulfill their required courses with lower division courses. A student admitted to the Department with graduate work completed elsewhere may petition the Graduate Committee for permission to apply course credits to the Departmental requirements. A student must take a minimum of three courses (including two graduate courses) in a field other than his three major fields. If one of the major fields is taken outside the Department of Political Science (see below), the three courses must be taken in a field outside the Department of Political Science.

In addition to the course requirements, each graduate student seeking the Ph.D. is

encouraged to show competence in teaching. This may be met by working as an honorary teaching assistant handling one section of a large undergraduate course for two quarters or as a regularly appointed teaching assistant.

**Ph.D. Preliminary Evaluation.** Within three years after admission, a student will be evaluated in his three major fields, one of which may be outside the Department (see below), as follows: (a) In one field other than that in which he took his M.A. screening examination he will write a written examination. The examination in each field is administered together with the M.A. examination twice a year, in the fall and spring; (b) for a second field the student will submit an acceptable chapter of a dissertation or a paper of superior quality of less than sixty pages in length; (c) in a third field on approval of the field committee the student will define a broad segment of the field for which he wants to be responsible. The student prepares a bibliographic essay or a course outline and an annotated bibliography organizing and integrating the material as he wishes. This paper becomes the basis of a structured oral examination in the field.

These requirements in all three major fields must be fulfilled within the same quarter. Upon satisfactory completion of these requirements as well as course work and language requirements, the student will be authorized to proceed to the University oral examination by decision of a five man evaluation committee composed of the chairmen of the field committees evaluating the student's written examination, Departmental oral examination and paper, his adviser and the graduate adviser or their alternates. The decision will be made on the basis of the student's total record. The student may not resubmit or retake any part of the Ph.D. preliminary evaluation, and the evaluation committee has only three options; (a) recommend the immediate holding of a University oral examination; (b) recommend a delay in the holding of the University oral examination by a maximum of six months; (c) terminate the student.

**A Field Outside the Department.** For one field, a student may request a substitution of a field outside the Department. The student together with his adviser and the instructor under whom he wishes to do his work outside the Department will draft a written proposal for the third field. The proposal must state the substantive material to be covered, the course program, and why the outside field is

being proposed. A minimum of three courses, including two graduate courses, must be taken in the chosen field. In exceptional cases, the outside field may include some course work within the Department of Political Science, provided that it is distinct from course work offered for examination in other departmental fields. The proposal must be signed by the student's adviser and the outside instructor, submitted three quarters in advance of the time the student expects to take the preliminary examinations, and approved by the Graduate Studies Committee.

**Doctoral Committee.** On the advice of the student's evaluation committee, the Department will request the appointment of a Doctoral Committee by the Graduate Council.

The Doctoral Committee will hold an oral examination to determine whether or not the student should be advanced to candidacy.

Upon being advanced to candidacy, the student will be awarded a C.Phil. degree. If the student chooses to go on to the Ph.D. degree he will submit to his Doctoral Committee for its approval a research design for the dissertation. The Doctoral Committee may approve and forward copies of the research design to the Department for its information. The dissertation must be approved and defended by the candidate before his Doctoral Committee within seven years after receiving the C.Phil. degree.

#### **Pre-Arrival Information**

See pages 51 and 153-160 of this catalog or the announcement of the Graduate Division.

#### **Master of Public Administration**

The program leading to the degree of Master of Public Administration is organized both for those who have earned a bachelor's degree and wish to prepare for a career in governmental administration, and for more advanced public servants who wish to supplement knowledge already obtained and increase their level of competence in theoretical and practical aspects of public administration. The program is administered by the Department of Political Science but is in essence an interdisciplinary program which offers an opportunity to the student to do work in departmental and nondepartmental fields related to public administration. The student may also work out program options in the field of administration illustrated by the options listed under (3) below. Specific inquiries regarding this program should be addressed to: Director, Master of Public

Administration Program, Mathematical Sciences 8308. Changes in the administration of this program are currently under review.

Students who complete the Master of Public Administration Program and who wish to enter the Ph.D. Program in Political Science must apply to the Graduate Division for a change of major. The applications will be reviewed by the Graduate Studies Committee of the Department. Candidates who are accepted for Ph.D. work in Political Science will have their M.P.A. comprehensive examinations accepted in lieu of the Departmental M.A. screening examination. (See above.)

**General Requirements.** See pages 153-154 of this bulletin.

**Admission to the Program.** (a) The student shall have received the degree of Bachelor of Arts with undergraduate preparation and/or work experience which the Master of Public Administration degree committee evaluates as satisfactory preparation. (b) Applicants must file a special application with the Director of the M.P.A. Program in the Department of Political Science, in addition to the application for admission to graduate status to be filed with the Graduate Division.

**Course Requirements.** The candidate must complete an approved program of at least nine courses of upper division and graduate work (36 units), consisting of not less than five graduate courses in the 200 series. In addition to these requirements, candidates must complete an approved internship in accordance with the internship requirement described below.

**Program.** Programs for each candidate will be prepared in consultation with the Program Director. Candidates must demonstrate competence in three fields: (1) administrative theory and processes; (2) political environment and institutions; and (3) a program specialty.

1. Administrative Theory and Processes. (Competence in all categories required.) Administrative theory; governmental organization and relations; staff and management processes; legislative and legal controls.

2. Political Environment and Institutions. (One option to be chosen.) State and local government; national government; international and comparative government.

3. Program Options. (One option to be chosen; listing is illustrative, not all inclusive.) Administrative law; defense; business regulation; community and group relations; community development; education; finance

and budgeting; foreign policy administration; housing and redevelopment; information systems; international development planning and administration; law enforcement; manpower and employment; natural resources; personnel; planning; public health; public relations; public welfare; science and technology; and transportation.

**Comprehensive Examinations.** Written examinations are conducted in each of the three fields of study. An oral examination follows successful completion of the written examinations.

**Internship.** Each candidate is required to complete an approved internship by working in a public agency or a government-related private organization before receiving the degree. In some instances, similar experience gained before entering the program may be substituted. In either case, an analytical report must be written and accepted. In the quarter when the report is to be completed, the candidate must be enrolled in course 401.

#### Lower Division Courses

##### 1. Introduction to American Government.

Lecture, three hours; discussion, one hour. An introduction to the principles and problems of government with particular emphasis on national government in the United States. This course fulfills the requirement of American History and Institutions, and is required of all students majoring in political science. The Staff

##### 2. World Politics.

Lecture, three hours; discussion, one hour. There are no prerequisites for this course. An introduction to recent and contemporary international relations and the foreign relations and policies of selected states. The Staff

##### 3A-3B. Introduction to Political Analysis.

###### 3A. Reading and Analysis of Contemporary Problems.

Background reading, writing and discussion in some one selected major contemporary problem (including, e.g., racial, urban, poverty, educational, and international problems). The Staff

###### 3B. Research and Field Study in Contemporary Problems.

An introduction to political science research. Directed research, including library and/or field research, in a major contemporary problem. The Staff

#### Upper Division Courses

Prerequisite for all upper division courses: upper division standing, except the core courses which may be taken in the sophomore year.

**GROUP I. POLITICAL THEORY****110. Early Modern Political Theory.**

Lecture, three hours; discussion, one hour. Core Course. An exposition and critical analysis of the major political philosophers and schools from Hobbes to Bentham. The Staff

**111. Ancient and Medieval Political Theory.**

An exposition and critical analysis of the major political philosophers and schools from Plato to Machiavelli.

Mr. Campbell, Mr. Rapoport, Mr. Wolfenstein

**112. Nature of the State.**

A systematic analysis of modern concepts and problems of political association. The Staff

**113. Late Modern and Contemporary Political Theory.**

An exposition and critical analysis of the major political philosophers and schools from Hegel to the present.

Mr. Ashcraft, Mr. Wolfenstein

**114. American Political Thought.**

A survey of the development of American ideas concerning political authority from Cotton and Williams to the present.

Mr. Farrelly, Mr. Rapoport, Mr. Smith

**115. Theories of Political Change.**

Prerequisite: course 110 or consent of the instructor. A critical examination of theories of political change, the relation of political change to changes in economic and social systems, and the relevance of such theories for the experience of both western and nonwestern societies.

Mr. Lofchie, Mr. Nixon

**117. Jurisprudence.**

This course may be counted in either Group I or Group V. Development of law and legal systems; consideration of fundamental legal concepts; contributions and influence of modern schools of legal philosophy in relation to law and government.

Mr. Gerstein, Mr. Sherwood

**119. Special Studies in Political Theory.**

Prerequisites: course 110 and one additional course in Group I, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to political theory. Sections will be offered on a regular basis with topics announced in the preceding quarter. The Staff

**GROUP II. INTERNATIONAL RELATIONS****120. Foreign Relations of the United States.**

Lecture, three hours; discussion, one hour. Core Course. A survey of the factors and forces entering into the formation and implementation of American foreign policy, with special emphasis on contemporary problems.

Mr. Brodie, Mr. Gerberding, Mr. Serfaty

**121. International Relations.**

Lecture, three hours; discussion, one hour. Core Course. An introduction to the politics, theory, and institutions of international relations with emphasis on contemporary practice.

Mr. Cattell, Mr. Spiegel, Mr. Wilkinson

**123. International Organization and Administration.**

A general survey of the institutions, political and administrative, of international organization, with emphasis on the United Nations. The Staff

**124. International Law.**

This course may be counted in either Group II or Group V. A study of the nature and place of international law in the conduct of international relations. The Staff

**127. The Atlantic Area in World Politics.**

A contemporary survey of the foreign policies of the North Atlantic countries and of cooperative efforts to attain political, economic, and military coordination on a regional basis. Mr. Zoppo

**128. The Soviet Sphere in World Politics.**

A contemporary survey of the foreign policies and aspirations of the Soviet Union and other states in the Soviet bloc; analysis of content and effects of Communist doctrine affecting relations between the Soviet and democratic spheres.

Mr. Cattell, Mr. Korbonski

**129. Regional International Politics.**

A comparative examination of regional international politics with reference to social, economic, and political patterns and regional organizations.

Mr. Cantori, Mr. Spiegel

**130. New States in World Politics.**

An analysis of the foreign policies and the role in world politics of new states. Mr. Wilson

**131. Latin American International Relations.**

The major problems of Latin-American international relations and organization in recent decades.

Mr. Gonzalez, Miss Kaufman

**132. International Relations of the Middle East.**

A study of the relations among the countries of the Middle East with special reference to the policies of the Great Powers. Mr. Kerr

**135. International Relations of East Asia.**

The relations of the countries of the East Asian seaboard, especially China, with their neighbors and the other powers, with emphasis on contemporary interests and policies of the United States vis-à-vis China. Mr. Baum, Mr. Steiner

**136. International Relations of the Western Pacific Area.**

The foreign policies of Japan, and the interests and policies of other countries, particularly the United States, in the Western Pacific Area.

Mr. Baerwald

**138A-138B-138C. Defense Studies.****138A. Defense Strategy and Policies.**

Theories on the causes of war and the national and international security problems created by the threat of war. Special emphasis on the United States, concerning both its own military policy and its role in an international alliance structure.

Mr. Brodie

**138B. The Conduct of Modern War.**

A study of World War II and the Korean War with special emphasis on problems of coalitions of nations in planning and operations. The Staff



**138C. Military Policy and Organization.**

This course may be counted in either Group II or Group VI. A study of the institutional and policy framework in the national military field.

Mr. Ries

**139. Special Studies in International Relations.**

Prerequisites: course 120 or 121 and one additional course in Group II, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to international relations. Sections will be offered on a regular basis with topics announced in the preceding quarter.

The Staff

**GROUP III. POLITICS****141. Public Opinion and Propaganda.**

Lecture, three hours; discussion, one hour. Core Course. A study of the nature and the means of formation of public opinion. Public opinion as a factor in popular government and as a control device in the modern state, with special reference to current conditions in American democracy.

Mr. Hensler, Mr. Marvick, Mr. Scoble

**142. The Politics of Interest Groups.**

A systematic investigation of the role of political interest groups in the governmental process, with attention directed to the internal organization, leadership, and politics of such groups; to the goals and functions of various types of groups, and to the strategy and tactics of influence.

Mr. Halpern, Miss Orren, Mr. Scoble

**143. Legislative Politics.**

A study of those factors which affect the character of the legislative process and the capacity of representative institutions to govern in contemporary society.

Mr. Gerberding, Mr. Snowiss

**144. The American Presidency.**

A study of the nature and problems of presidential leadership, emphasizing the impact of the bureaucracy, congress, public opinion, interest groups, and the party system upon the presidency and national policy-making.

Mr. Snowiss

**145. Political Parties.**

Lecture, three hours; discussion, one hour. Core Course. Organization functions, and practices of political parties primarily in the United States, with attention to campaign functions, membership problems, political finance, and policy-formation practices.

Mr. Farrelly

**146. Political Behavior Analysis.**

The use of quantitative methods in the study of political behavior, especially in relation to voting patterns, political participation, and techniques of political action. Mr. Hensler, Mr. Marvick, Mr. Scoble

**149. Special Studies in Politics.**

Prerequisites: course 141 or 145 and one additional course in Group III, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to politics. Sections will be offered on a regular basis with topics announced in the preceding quarter.

The Staff

**GROUP IV. COMPARATIVE GOVERNMENT****150. Introduction to Comparative Government and Politics.**

Lecture, three hours; discussion, one hour. Core Course. The structure and dynamics of the principal types of political systems of the world. Contemporary states will be studied for purposes of illustration.

The Staff

**152. British Government.**

The government and politics of the United Kingdom; the British constitution, parliament, parties and elections, foreign policies, administrative problems, and local governments.

The Staff

**153. Governments of Western Europe.**

The constitutional and political structure and development of France and other states of continental Western Europe, with particular attention to contemporary problems.

Mr. Fried

**154. Governments of Central Europe.**

The constitutional and political structure and development of Germany and other Central European states, with particular attention to contemporary problems.

Mr. Korbonksi

**156. The Government of the Soviet Union.**

An intensive study of the political and institutional organization of the Soviet Union and its component parts, with special attention to contemporary political issues, as well as party and governmental structures.

Mr. Cattell

**157. Governments of Eastern Europe.**

A study of the political and governmental organization of the Communist countries of Eastern and Central Europe (exclusive of the U.S.S.R.) with special reference to the institutions, practices and ideologies including interregional relations.

Mr. Korbonksi

**159. Chinese Government and Politics.**

Organization and structure of Chinese government with particular attention to the policies, doctrines, and institutions of Chinese Communism; political problems of contemporary China.

Mr. Baum, Mr. Steiner

**160. Japanese Government and Politics.**

The structure and operation of the contemporary Japanese political system, with special attention to domestic political forces and problems. Mr. Baerwald

**161. Government and Politics in Southeast Asia.**

The institutional structures and political processes of states in Southeast Asia (Burma, Thailand, Malaya, Laos, Cambodia, Vietnam, Indonesia, the Philippines) attending principally to problems of institutional transformations and political stabilization.

Mr. Wilson

**162. Government and Politics in South Asia.**

The political experiences and institutions of the Indian subcontinent since 1947, with particular attention to the Republic of India, but also with reference to Pakistan and Ceylon.

Mr. Sisson, Mr. Steiner

**164. Government and Politics in the Middle East.**

A comparative study of government in the Arab States, Turkey, Israel and Iran.

Mr. Keen

**165. Government and Politics in North Africa.**

A comparative study of the government and politics of the North African states, including the relationship between political development, political organization and social structure. Mr. Cantori

**166A-166D. Government and Politics in Sub-Saharan Africa.**

(Formerly numbered 166.)

166A. English-speaking Western Africa.

166B. Eastern Africa.

166C. French-speaking Africa.

166D. Southern Africa.

Patterns of political change in Africa south of the Sahara with special reference to nationalism, nation-building and the problems of development. (Course is offered in four parts.)

Mr. Lofchie, Mr. Sklar

**167. Ideology and Development in World Politics.**

A comparative study of the major modes of political and economic development in the world today. Relations between industrial and nonindustrial societies are examined in light of the current debate about imperialism. Mr. Sklar

**168A. Government and Politics in Latin America.**

A comparative study of governmental and political development, organization and practices in the states of Middle America. Mr. Gonzalez, Miss Kaufman

**168B. Government and Politics in Latin America.**

A comparative study of governmental and political development, organization and practices in the states of South America. Mr. Gonzalez, Miss Kaufman

**169. Special Studies in Comparative Government.**

Prerequisites: course 150 and one additional course in Group IV, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to comparative government. Sections will be offered on a regular basis with topics announced in the preceding quarter. The Staff

See also Courses 188A, 188B.

**GROUP V. PUBLIC LAW****170. The Anglo-American Legal System.**

Lecture, four hours; discussion, one hour. Core Course. Evolution of the English common law courts and their legal system, with special emphasis on the contributions made by canon law, the law merchant and equity; the theory of *stare decisis* as illustrated by the evolution of modern rules of negligence.

Mr. Gerstein, Mr. Grant

**171. The Supreme Court.**

Lecture, four hours; discussion, one hour. Core Course. The history, procedures, and role of the Supreme Court in its legal-constitutional and political aspects. Emphasis will be given to the current and recent activities of the Court. Decisions of the Court, historical and current commentaries, and judicial biography will be utilized.

Mr. Farrelly, Mr. Hobbs, Mr. Longaker

**172A. American Constitutional Law.**

Constitutional questions concerning the separation of powers, federalism, and the relationship between government and property. Mr. Gerstein, Mr. Hobbs

**172B. American Constitutional Law.**

The protection of civil and political rights and liberties under the Constitution.

Mr. Gerstein, Mr. Hobbs

**173. Government and Business.**

This course may be counted in either Group V or VI. The nature of the corporation; the regulation of competition; government promotion of economic interests; regulation of industries clothed with a public interest; government ownership and operation.

Mr. Bernstein, Miss Orren

**174. Government and Labor.**

This course may be counted in either Group V or VI. The labor force and the nature of the trade union; regulation of labor relations; programs to encourage full employment and to mitigate unemployment; protective labor legislation. Mr. Bernstein

**179. Special Studies in Public Law.**

Prerequisites: course 170 or 171 and one additional course in Group V, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to public law. Sections will be offered on a regular basis with topics announced in the preceding quarter. The Staff

See also Courses 117, 124, 182, and 187.

**GROUP VI. PUBLIC ADMINISTRATION AND LOCAL GOVERNMENT****180. State and Local Government.**

Lecture, three hours; discussion, one hour. Core Course. Development of state constitutions; the political, administrative, and judicial systems of state and county government; and relations between the state and local government, with special reference to California. Mr. Bollens, Mr. Crouch

**181. Introduction to Public Administration.**

Lecture, three hours; discussion, one hour. Core Course. An introduction to modern theories of administration; the relation of administration to the political process; and the analysis of administrative organization and processes, including planning, personnel, finance, and law. The Staff

**182. Municipal Government.**

This course may be counted in either Group IV or Group VI. A study of the modern municipality in the United States; legal aspects of city government; local election problems; types of municipal government; problems of metropolitan areas; relationship of the cities to other units; problems bearing on city government today.

Mr. Bollens, Mr. Crouch, Mrs. Rabinovitz

**183. Administration of International Agencies and Programs.**

An examination of the administrative patterns and practices of the United Nations agencies and overseas development programs, including distinctive characteristics of organization and management selection of personnel, and methods of financing.

The Staff

**184. Metropolitan Area Government.**

An analysis of the problems, politics, organization, and functions of government in metropolitan areas.

Mr. Bollens, Mr. Crouch, Mrs. Rabinovitz

**185. Public Personnel Administration.**

The process of formulating and administering public personnel policies; concepts and principles utilized in selected governmental personnel systems. Focus will be primarily upon governmental systems in the United States (national, state, local, foreign service, military) but also comparisons will be made with selected other governmental systems.

Mr. Crouch

**186. National Policy and Administration.**

A study of the major policies and programs of the national government and their administration as illustrated in such areas as national defense, social welfare, agriculture, etc. Particular attention will be paid to the role of the President and other administrators in formulating public policy and in maintaining a responsible bureaucracy.

Mr. Engelbert, Mr. Fried, Mr. Ries

**187. Law and Administration.**

This course may be counted in either Group V or Group VI. Legal controls of administration action. Substantive and procedural limits on administrative discretion imposed by legislation, executive and judicial agencies and the sources of legal powers of administrative bodies within these limits.

Mr. Sherwood

**188A. Comparative Public Administration.**

This course may be counted in either Group IV or Group VI. An analysis of bureaucratic structures and functions in the United States, other industrialized, and less developed countries, primarily at the national level. Special attention is paid to methods of comparative analysis and the utility of various models.

Mr. Fried

**188B. Comparative Urban Government.**

This course may be counted in either Group IV or Group VI. A cross-cultural examination of the forms and processes of urban government. Particular attention will be paid to the role of urbanization in political development.

Mr. Fried, Mrs. Rabinovitz

**189. Special Studies in Public Administration.**

Prerequisites: course 180 or 181 and one additional course in Group VI, and any special requirements. Permission of the instructor is required for enrollment. Members of the faculty will take up for intensive examination one or more special problems appropriate to public administration. Sections will be offered on a regular basis with topics announced in the preceding quarter.

The Staff

**190. Administrative Theory.**

An examination of the theoretical framework of public administration, with emphasis upon ideologies, values, behavioral patterns, and concepts of organization. Particular attention will be paid to the locus and control of administrative power.

Mr. Engelbert, Mr. Fried, Mr. Halpern

**191. Urban and Regional Planning and Development.**

A comparative study of governmental policies, procedures, and agencies involved in the planning and development of urban and regional communities and areas.

Mr. Bollens, Mr. Engelbert, Mr. Hoffenberg

**192. Science and Public Policy.**

An examination of the role of science and scientists in public affairs with emphasis upon the policies and administration of science programs. Particular

attention will be paid to the values and behavioral patterns of science groups and professions.

Mr. Engelbert

See also Courses 138C, 173, and 174.

**UNGROUPED****197A-197D. Undergraduate Honors Proseminars.**

Prerequisite: four upper division courses of political science and a general grade-point average of 3.0. Several proseminars will be offered each quarter, dealing with selected research topics to be announced during the preceding quarter. Admission by consent of the Department and the instructor. No pre-enrollment permitted. See additional information in statement of requirements for the major in political science.

The Staff

**199. Readings in Political Science. (½ to 1 course)**

Prerequisite: upper division standing and consent of the instructor. May be repeated for a total of four full courses. Individual study.

The Staff

**Graduate Courses****203. Introduction to Political Inquiry.**

203A. Problems of Scientific Inquiry and Normative Discourse.

203B. Major Conceptual Frameworks and Approaches to Political Science.

Normally, 203A or its equivalent will be taken prior to 203B.

203C. Research Methods and Techniques of Political Science.

The Staff

**211. Political Theory.**

An analysis of the central problems of political inquiry and their relation to political philosophy.

Mr. Nixon, Mr. Rapoport

**212. International Relations.**

An examination of contemporary theories and methodologies in international relations, with applications to contemporary international politics.

The Staff

**214A. Politics and Society.**

An analysis of attitude formation, electoral behavior, political socialization and political recruitment, with special emphasis upon American materials.

The Staff

**214B. The Study of Politics.**

An analysis of the major approaches to the study of the American political system, with special emphasis upon the character of decision-making processes.

The Staff

**215. Comparative Government.**

Approaches to the study of comparative politics and problems of comparative political analysis.

The Staff

**216. Public Law.**

A systematic analysis of the scope and nature of public law, with particular attention given to its materials and methods as illustrated in concepts and doctrines drawn from various of its subject fields.

The Staff

**218A. Public Administration and Local Government.**

An analysis of the nature and scope of public administration and its role in modern political systems. An introduction to the problems of government of local subsystems.

The Staff

**218B. The Administrative System.**

A behavioral analysis of the processes of public administrative structures in the American political system. Emphasis on the possibilities for and limits on rational decision-making and program innovation and on the problems of maintaining public responsibility. The Staff

**220. Special Studies in Political Theory.**

Directed work in the history of political theory for students preparing for the M.A. or Ph.D. examination in political theory.

Mr. Ashcraft, Mr. Nixon, Mr. Rapoport

**221. Selected Texts in Political Theory.**

A critical examination of major texts in political theory with particular attention to their philosophic system, their relations to the contemporary political and intellectual currents, and the importance of the system for present-day political analysis. The Staff

**222. Selected Topics in Political Theory.**

A critical examination of a major problem in political theory. The Staff

**224. Studies in Politics.****224A. Quantitative Applications.**

A survey of quantitative research techniques and their application to the study of political phenomena.

Mr. Hensler, Mr. Marvick

**224B. Political Recruitment.**

Intensive and critical evaluation of behavioral literature concerned with the provenance and *cursum honorum* of public men, and with the screening and sponsoring mechanisms affecting their careers and political perspectives. Mr. Marvick

**224C. Political Sociology.**

A consideration of problems common to Political Science and Sociology, with special attention to the applicability of selected sociological theories to political phenomena. Mr. Snowiss

**224D. The Group Process.**

Critical appraisal of "group theory" approaches to the study of political decision-making, with special attention to empirical research problems and findings. Mr. Halpern, Mr. Hensler, Mr. Scoble

**224E. Legislative Behavior.**

The analysis of the major approaches to the study of representative institutions, with special emphasis upon the assumptions, concepts, methods, and theoretical implications associated with each approach. Mr. Snowiss

**224F. Political Leadership.**

An analysis of political leaderships, with emphasis on the American presidency and its relation to various aspects of American politics, including Congress, political parties, elections, and public opinion. Mr. Longaker

**224G. Political Psychology.**

(Same as Psychology 228.) Examination of political behavior, political socialization, personality and politics, racial conflict, and the analysis of public opinion on these issues. Mr. Marvick, Mr. Sears

**224H. Comparative Community Political Systems.**

Same as Architecture and Urban Planning 213. Critical evaluation of the literature on community power and secondary analysis of data from extant research (primarily American, but increasingly comparative). Special attention to power distributions, leadership recruitment, and public and private decision-making. Mr. Scoble

**225. Selected Topics in Comparative Government.**

A critical examination of a major problem in comparative government. The Staff

**228A. Personnel and Human Relations.**

An analysis of the policies, processes, organizations, and interrelationships involved in manning the public services. Mr. Crouch

**228B. Public Planning, Programming, and Budgeting.**

Public budgeting processes within a political and organizational framework. Special emphasis on the Federal program-budgeting system and the interplay between contemporary bureaucratic and decision theory of rational allocation of resources. Mr. Hoffenberg, Mr. Ries

**229. Urban Government.**

An analysis of the policies, processes, interrelations, and organization of governments in heavily populated areas. Mr. Bollens, Mr. Fried, Mrs. Rabinovitz

**230. Comparative Development Administration.**

An analysis of the administration of development programs and the development of administrative institutions, with special attention to ecology. Comparisons are made both between countries and within countries. Mr. Engelbert, Mr. Fried, Mr. Sisson

**231. Studies in International Relations.****231A. Contemporary Problems in United States Foreign Policy.**

An intensive analysis of the policy-formulation process and the substance of selected contemporary problems in foreign policy. Political and institutional factors affecting foreign policies will be stressed along with the analysis of policy options. Mr. Gerberding

**231B. National and International Defense Problems.**

This course analyzes various national security problems in both their military-technical and political dimensions. It seeks to develop in some depth issues likely to be raised in Political Science 138A, which, however is not a prerequisite. Mr. Brodie

**231C. International Law and Organization.**

This course emphasizes the role of law and organization in the conduct of contemporary international politics. International organization is considered as an integral process within the contemporary international legal system whose characteristics are explored in depth. The Staff

**231D. International Relations Theory.**

An introduction to contemporary problems in international relations theory. Mr. Martin, Mr. Wilkinson

**231E. Theories of Regional International Relations.**

An examination of varying approaches to the study of regional international relations. Mr. Cantori, Mr. Spiegel

**238. Studies in Public Law.****238A. Evolution of Anglo-American Law Books.**

Surviving early records. Case reporting, from the year books to the modern reports. Legal treatises from Glanvill to today. Statutes and how to find them. The language of the law. Although emphasis will be placed upon American materials the entire English speaking world will be covered. Mr. Gerstein, Mr. Grant

**238B. Making of the Constitution.**

An examination of the development of constitutional law during selected periods of American history, such as Founding, the Marshall and Taney eras, and the New Deal. The focus will be on both judicial and nonjudicial materials.

Mr. Hobbs, Mr. Longaker

**238C. The Bill of Rights and the States.**

An examination of the problems surrounding the application to the states of Amendments 1-9.

Mr. Grant, Mr. Hobbs

**238D. Current Problems in Public Law.**

A discussion of selected contemporary problems in jurisprudence, the judicial process, judicial behavior, and legal controls on social conduct.

Mr. Gerstein, Mr. Longaker

**Graduate Seminars**

Prerequisite for all graduate seminars: advance consent of instructors.

**250. Seminars in Regional and Area Political Studies.**

250A. Latin-American Studies. Mr. Gonzalez

250B. Russian and Slavic Studies. Mr. Cattell, Mr. Korbonski

250C. Chinese and East Asian Studies. Mr. Baum, Mr. Steiner

250D. Japanese and Western Pacific Studies. Mr. Baerwald

250E. African Studies. Mr. Lochie, Mr. Sklar

250F. Middle Eastern Studies. Mr. Kerr

250G. Commonwealth Studies. The Staff

250H. Western European Studies. Mr. Fried

250J. Southeast Asian Studies. Mr. Wilson

250K. North African Studies. Mr. Cantori

250L. South Asian Studies. Mr. Sisson

252. Seminar in Public Law. The Staff

253. Seminar in International Relations. The Staff

254. Seminar in Public Administration. The Staff

**256A-256B. Seminar in Comparative Government.**

Credit given only upon completion of both quarters. The Staff

257. Seminar in Political Theory. The Staff

**259. Seminar in Political and Electoral Problems.**

Prerequisite: two graduate courses in Politics, including at least one in the 214 sequence. The Staff

262. Seminar in Municipal Government. The Staff

**263. Seminar in Political and Administrative Aspects of Planning.**

(Same as Urban Planning 203.)

The Staff

**271. Seminar in Political Change.**

An interdisciplinary seminar directed toward the analysis of political change. To be offered by members of the Department of Political Science. The Staff

**Professional Course****401. Internship in Public Service. (½ to 1 course)**

Directed work in applying the techniques of public administration during a period of service in a governmental agency. A required course for students enrolled in the Master of Public Administration program. Open to other properly qualified graduate students upon application.

Mr. Bollens, Mr. Engelbert

**Individual Study and Research****596. Directed Individual Study or Research.**

(½ to 1 course)

A letter grade (A, B, C, D, or F) will be assigned by the professor supervising the study or research. May apply toward the minimum course requirement for the master's degree, and it ordinarily may be used for this requirement only once.

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examinations for the Ph.D. (½ to 2 courses)**

This course is ordinarily taken only during the quarter in which the student is being examined. A grade of Satisfactory (S) or Unsatisfactory (U) will be assigned by the Department on the basis of the student's performance in the examination(s).

**598. Research for and Preparation of the Master's Thesis. (½ to 2 courses)**

A grade of Satisfactory (S) or Unsatisfactory (U) will be assigned by the professor supervising the master's thesis. (This course will rarely be taken in the Department because students normally receive their master's degree under the Comprehensive Examination Plan.)

**599. Research for and Preparation of the Doctoral Dissertation. (½ to 2 courses)**

A grade of Satisfactory (S) or Unsatisfactory (U) will be assigned by the professor supervising the dissertation.

There is no restriction on the number of times an individual student may enroll in any of the 590 series courses.

**■ PSYCHIATRY**

(Department Office, B8-262 Center for the Health Sciences)

Norman Q. Brill, M.D., *Professor of Psychiatry.*

Nathaniel A. Buchwald, Ph.D., *Professor of Anatomy in Residence.*

Joaquin M. Fuster, M.D., *Professor of Psychiatry in Residence.*

Harry J. Jerison, Ph.D., *Professor of Medical Psychology in Residence.*

- James T. Marsh, Ph.D., *Professor of Medical Psychology.*  
 Ivan N. Marsh, Ph.D., *Professor of Medical Psychology.*  
 George J. Popjak, M.D., *Professor of Psychiatry and Biological Chemistry.*  
 Arnold B. Scheibel, M.D., *Professor of Psychiatry and Anatomy.*  
 Robert J. Stoller, M.D., *Professor of Psychiatry.*  
 George Tarjan, M.D., *Professor of Psychiatry and Public Health in Residence.*  
 L. J. West, M.D., *Professor of Psychiatry (Chairman of the Department).*  
 Henry H. Work, M.D., *Professor of Psychiatry and Public Health.*  
 Stanley W. Wright, M.D., *Professor of Psychiatry and Pediatrics.*  
 Frank F. Tallman, M.D., *Emeritus Professor of Psychiatry.*  
 Charles W. Tidd, M.D., *Emeritus Professor of Psychiatry.*  
 Pietro Castelnovo-Tedesco, M.D., *Associate Professor of Psychiatry in Residence.*  
 Robert B. Edgerton, Ph.D., *Associate Professor of Anthropology in Residence.*  
 Samuel Eiduson, Ph.D., *Associate Professor of Biological Chemistry in Residence.*  
 Frank M. Hewett, Ph.D., *Associate Professor of Education and Medical Psychology.*  
 Anthony Kales, M.D., *Associate Professor of Psychiatry in Residence.*  
 Henry Lesse, M.D., *Associate Professor of Psychiatry in Residence.*  
 Michel Philippart, M.D., *Associate Professor of Pediatrics in Residence.*  
 Richard J. Schain, M.D., *Associate Professor of Pediatrics in Residence.*  
 Lowell H. Storms, Ph.D., *Associate Professor of Medical Psychology in Residence.*  
 Charles W. Wahl, M.D., *Associate Professor of Psychiatry.*  
 Frederick D. Abraham, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Roland M. Atkinson, M.D., *Assistant Professor of Psychiatry in Residence.*  
 William C. Beckwith, Ph.D., *Adjunct Assistant Professor of Psychiatry.*  
 Martha E. Bernal, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Robert J. Bonkowski, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 J. Alfred Cannon, M.D., *Assistant Professor of Psychiatry and Public Health in Residence.*  
 Roberta Crutcher, M.D., *Adjunct Assistant Professor of Psychiatry.*  
 Louise D. Epps, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Edward Geller, Ph.D., *Assistant Professor of Psychiatry in Residence.*  
 Joshua S. Golden, M.D., *Assistant Professor of Psychiatry in Residence and Assistant Dean of the Medical School.*  
 Roderic Gorney, M.D., *Assistant Professor of Psychiatry and Social Welfare in Residence.*  
 Frederick Gottlieb, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Richard Green, M.D., *Assistant Professor of Psychiatry in Residence.*  
 John Hanley, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Jean C. Holroyd, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 David I. Janowsky, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Lewis L. Judd, M.D., *Assistant Professor of Psychiatry and Psychology.*  
 John G. Kennedy, Ph.D., *Assistant Professor of Anthropology in Residence.*  
 Boyd M. Krout, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Calista V. Leonard, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Edward H. Liston, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Gayle G. Marsh, Ph.D., *Assistant Professor of Psychiatry.*  
 Thelma S. Moss, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Kazuo Nihira, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Edward M. Ornitz, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Robert O. Pasnau, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Morris J. Paulson, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Robert J. Rhodes, Ph.D., *Assistant Professor of Medical Psychology in Residence.*  
 Edward R. Ritvo, M.D., *Assistant Professor of Psychiatry in Residence.*

Alexander C. Rosen, Ph.D., *Assistant Professor of Medical Psychology and Psychology in Residence.*  
 Robert T. Rubin, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Paul F. Slawson, M.D., *Assistant Professor of Psychiatry in Residence.*  
 John M. Suarez, M.D., *Assistant Professor of Psychiatry in Residence.*  
 J. Thomas Ungerleider, M.D., *Assistant Professor of Psychiatry in Residence.*  
 Arthur Yuwiler, Ph.D., *Assistant Professor of Psychiatry in Residence.*  
 Leila Beckwith, Ph.D., *Instructor in Medical Psychiatry in Residence.*  
 Elliot M. Brener, Ph.D., *Instructor in Medical Psychology in Residence.*  
 Richard Friedman, M.D., *Instructor in Psychiatry in Residence.*  
 Bertram Goldstein, M.D., *Instructor in Psychiatry in Residence.*  
 Howard F. Miller, Ph.D., *Instructor in Medical Psychology in Residence.*  
 Douglas R. Schiebel, Ph.D., *Instructor in Medical Psychology in Residence.*  
 Kenneth N. Silvers, M.D., *Instructor in Psychiatry in Residence.*  
 Charles B. Stone, M.D., *Instructor in Psychiatry in Residence.*  
 Alvin S. Yusin, M.D., *Instructor in Psychiatry in Residence.*



Suzanne G. Bonkowski, M.S.W., *Associate in Social Work.*  
 William H. Boyd, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Marvin Brown, M.S.W., *Lecturer in Social Work.*  
 Maury T. Carlin, Ph.D., *Clinical Instructor in Medical Psychology.*  
 Robert E. Carrel, M.D., *Assistant Clinical Professor of Psychiatry and Pediatrics.*  
 Ronald H. Cooper, J.D., *Lecturer in Psychiatry.*  
 Herbert H. Eveloff, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Hanna Fenichel, Ph.D., *Associate in Psychiatry.*  
 Don E. Flinn, M.D., *Associate Clinical Professor of Psychiatry.*  
 Charles V. Ford, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Steven R. Forness, Ph.D., *Demonstration Teacher.*  
 Barbara Frederich, M.S.W., *Associate in Social Work.*  
 Florence Frisch, M.S.W., *Associate in Social Work.*  
 Irene T. Goldenberg, Ed.D., *Clinical Instructor in Medical Psychology.*  
 Nancy B. Graves, M.A., *Acting Assistant Professor of Anthropology.*  
 Ronald J. Griffith, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Betty L. Harker, M.S.S., *Lecturer in Social Work.*  
 Sheldon H. Kardener, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Charles V. Keeran, M.S.W., *Lecturer in Public Health.*  
 Julian Kivowitz, M.D., *Clinical Instructor in Psychiatry.*  
 Norma E. Lappen, M.S.W., *Associate in Social Work.*  
 Perry C. Lessin, M.S.W., *Associate in Social Work.*  
 Eugene A. Levitt, Ph.D., *Assistant Clinical Professor of Medical Psychology.*  
 Philip R. A. May, M.D., *Clinical Professor of Psychiatry.*  
 Jack A. Morgenstern, M.D., *Assistant Clinical Professor of Psychiatry.*  
 Freda G. Morris, Ph.D., *Assistant Clinical Professor of Medical Psychology.*  
 Lawrence E. Newman, M.D., *Clinical Instructor in Psychiatry.*  
 James O. Palmer, Ph.D., *Associate Clinical Professor of Medical Psychiatry and Lecturer in Psychology.*  
 Irene Paulson, M.S.W., *Associate in Social Work.*  
 Stephanie L. Pearlstein, M.S.S., *Associate in Social Work.*  
 Frederick R. Penrose, M.S.W., *Associate in Social Work.*  
 Gloria J. Powell, M.D., *Clinical Instructor in Psychiatry.*  
 Lynn Rehm, Ph.D., *Acting Instructor in Medical Psychiatry in Residence.*  
 Patricia J. Rickert, M.S.W., *Associate in Social Work.*  
 Rita R. Rogers, M.D., *Associate Clinical Professor of Psychiatry.*

Margarete Ruben, *Associate in Psychiatry.*

Ernest M. Sable, M.P.H., *Lecturer in Mental Hospital Administration.*

Barbara R. Salkin, M.S.W., *Associate in Social Work.*

James Q. Simmons, M.D., *Associate Clinical Professor of Psychiatry.*

Roland C. Summit, M.D., *Lecturer.*

Mario Valente, M.D., *Assistant Clinical Professor of Psychiatry and Pediatrics.*

### Program

The Department of Psychiatry offers an advanced training program in social and community psychiatry leading to the new degree of Master of Social Psychiatry (M.S.P.). The Department cooperates with the School of Public Health in offering courses leading to the degree of Master of Public Health. Curriculum requirements are described in the UCLA ANNOUNCEMENT OF THE SCHOOL OF PUBLIC HEALTH and on page 148 of this bulletin. In addition the Department participates in an interdisciplinary program of mental health research training.

### Master of Social Psychiatry Degree

The two-year program for the Master of Social Psychiatry degree, largely funded by the National Institute of Mental Health, includes training in statistical methods, interdisciplinary research, pertinent social science training, mental health consultation and group dynamics. Also included is training in organization and administration of community mental health services with appropriate field placement. Special emphasis is given to the interdisciplinary team approach in attempting to understand the crucial variables in community structure and in seeking solutions to mental health problems of populations particularly associated with poverty, minorities, and related urban crises.

### Admission Requirements for the Master of Social Psychiatry Degree

Requirements for admission are acceptance by the UCLA Graduate Division, approval of the staff of the Division of Social and Community Psychiatry, an M.D. degree and completion of at least two years of psychiatric residency training at a center approved by the American Board of Psychiatry and Neurology.

Three types of applicants are eligible for admission to the degree program: 1) applicants who have completed three years of an approved psychiatric residency and who are funded by two-year stipends from the National Institute of Mental Health, 2) third year psychiatric residents who may combine

their last year of residency with the first year of the degree program and complete the program the following year, and 3) selected applicants in the UCLA child psychiatry training program who combine training in child psychiatry and social and community psychiatry.

### Degree Requirements

With the consent of his faculty adviser, each candidate must pursue one of the following plans for the Master of Social Psychiatry degree. Under either plan, all requirements for the degree must be satisfied within one calendar year from the time of completion of course requirements.

**Thesis Plan.** At least 9 courses in the graduate or upper division level and a thesis are required. No less than 5 of the 9 courses must be in the graduate level 400 or 500 series of social psychiatry. After these requirements are met, the candidate may select any course in the 100 or 200 series (a minimum of three courses in the Departments of Anthropology or Sociology is required), subject to approval by the graduate adviser.

**Comprehensive Examination Plan.** A minimum of 11 courses of graduate and upper division level are required, of which at least 6 courses must be in the graduate level 400 or 500 series of social psychiatry. After these requirements are met, the student may select any course in the 100 or 200 series (a minimum of three courses in the Departments of Anthropology or Sociology is required), subject to approval by the graduate adviser. The comprehensive written and oral examination will cover the following subject areas: (a) Community psychiatry administration theory and practice; (b) Mental health consultation theory and application; (c) The social sciences in psychiatry; (d) Research methods in social psychiatry.

**Required Courses.** Mandatory courses for the Master of Social Psychiatry degree are: (a) Social Psychiatry in Theory and Practice (Psychiatry 454A-454B); (b) Statistics (Psychiatry 461, Public Health 160A, Sociology 110A, or Psychology 250A); (c) Concepts of Mental Health Consultation (Psychiatry



456A-456B); (d) Research Methods in Social Psychiatry (Psychiatry 457A-457B); (e) Administration in Community Psychiatry (Psychiatry 460A-460B).

Upper Division Course

### 105. The Social Sciences in Psychiatry.

(Same as Anthropology 101.) Prerequisite: consent of the instructor. An introduction to the fields of social psychology, sociology, cultural anthropology, and ethology. Mr. Kennedy

Graduate Courses

### 200. Basic Concepts in Psychiatry. (½ course)

The psychiatric disorders are studied to aid the research worker. Problems of behavior evaluation and symptom development are considered. May be taken for credit three times. Mr. Kales

### 201. Contemporary Problems in Behavioral Experimentation. (½ course)

Animal and human research in the behavioral sciences will be reviewed. Specific subject matter will vary according to the interests of the students. The Staff

Professional Courses

### 454A-454B. Social Psychiatry in Theory and Practice. (½ course each)

(Formerly numbered 255A-255B.) Prerequisite: graduate standing in social science discipline and consent of the instructor. Introduction to problem areas of social and community psychiatry. Mr. Cannon

### 455. Introduction to Community Structure. (½ course)

Prerequisite: graduate standing in social science discipline and consent of the instructor. Coordinated field visits and seminars to provide an understanding of the relationship between institutions observed and the mental health field. Mr. Cannon

### 456A-456B. Concepts of Mental Health Consultation.

(Formerly numbered 251.) Lecture, two hours; field placement, six hours. Prerequisite: graduate standing in social science discipline and consent of the instructor. Course 457A is prerequisite for course 457B. Review of major theories of consultation and presentation of techniques for dealing with common problems of consultant-client interactions. Mr. Cannon

### 457A-457B. Research Methods in Social Psychiatry. (½ course each)

Prerequisite: graduate standing in social science discipline and consent of the instructor. Course 457A is prerequisite for course 457B. Emphasis upon interdisciplinary evolution of social psychiatric research methods. Mr. Kennedy

### 458. Problems in Culture and Mental Health.

(½ course)

(Formerly numbered 250.) Prerequisite: graduate standing in social science discipline and consent of the instructor. Study of the mental health patterns of various ethnic and social class groups. Mr. Kennedy

### \*459. The Social Epidemiology of Mental Illness.

(½ course)

(Formerly numbered 254.) Prerequisite: graduate standing in social science discipline and consent of the instructor. Historical review of the development of the field, and an examination of the contribution of factors of ethnicity, social class, and urban residence to the development of mental illness symptomatology. The Staff

### 460A-460B. Administration in Community Psychiatry. (1½ courses only)

(Formerly numbered 253A-253B.) Lecture, two hours; laboratory, 16 hours. Prerequisite: graduate standing in social science discipline and consent of the instructor. Review of administrative practices in operating community-based mental health programs, including psychiatric hospitals, outpatient services, and community clinics. Mr. Tallman

### 461. Statistical Methods in Social Psychiatry. (½ course)

Lecture, two hours; laboratory, two hours. Prerequisite: graduate standing in Social and Community Psychiatry. Statistical methods appropriate for community mental health research. Problems in measurement of human behavior, descriptive statistics, parametric and nonparametric tests of group differences, correlation and partial correlation. Emphasis on appropriate use of statistical techniques especially in field study designs. Mrs. Epps

### 462A-462B-462C. Advanced Mental Health Consultation. (½ to 1 course)

Lecture, two hours; field work, four to eight hours. Prerequisite: course 456A-456B and consent of instructor. Advanced analysis of theoretical and practical issues in mental health consultation based upon assigned, ongoing field consultations of the participants and on the study of advanced theory of consultation and organization. Mr. Newman, Mr. Cannon

Individual Study and Research

### 596. Special Studies in Social Psychiatry.

(½ to 1 course)

Prerequisite: advanced graduate standing in Social and Community Psychiatry. A course of independent study designed for advanced graduate students in social psychiatry who desire to specialize in an area involving supervised research and study. The Staff

## ■ PSYCHOLOGY

(Department Office, 1283 Franz Hall)

William E. Broen, Jr., Ph.D., *Professor of Psychology.*

Edward C. Carterette, Ph.D., *Professor of Psychology.*

Harry W. Case, Ph.D., *Professor of Psychology and Engineering.*

\* Not to be given, 1970-1971.

- Richard Centers, Ph.D., *Professor of Psychology.*  
 James C. Coleman, Ph.D., *Professor of Psychology and Education.*  
 Andrew L. Comrey, Ph.D., *Professor of Psychology.*  
 Seymour Feshbach, Ph.D., *Professor of Psychology and Head of the Fernald School.*  
 Joseph A. Gengerelli, Ph.D., *Professor of Psychology.*  
 Harold B. Gerard, Ph.D., *Professor of Psychology.*  
 Michael J. Goldstein, Ph.D., *Professor of Psychology.*  
 Milton E. Hahn, Ph.D., *Professor of Psychology.*  
 Wendell E. Jeffrey, Ph.D., *Professor of Psychology.*  
 F. Nowell Jones, Ph.D., *Professor of Psychology (Chairman of the Department).*  
 Harold H. Kelley, Ph.D., *Professor of Psychology.*  
 George F. J. Lehner, Ph.D., *Professor of Psychology.*  
 Donald B. Lindsley, Ph.D., *Professor of Psychology and Physiology.*  
 O. Ivar Lovaas, Ph.D., *Professor of Psychology.*  
 John H. Lyman, Ph.D., *Professor of Engineering and Psychology.*  
 Irving Maltzman, Ph.D., *Professor of Psychology.*  
 Charles Y. Nakamura, Ph.D., *Professor of Psychology.*  
 Allen Parducci, Ph.D., *Professor of Psychology.*  
 Bertram H. Raven, Ph.D., *Professor of Psychology.*  
 Eliot H. Rodnick, Ph.D., *Professor of Psychology.*  
 John P. Seward, Ph.D., *Professor of Psychology.*  
 Joseph G. Sheehan, Ph.D., *Professor of Psychology.*  
 Gerald H. Shure, Ph.D., *Professor of Psychology and Sociology.*  
 Marion A. Wenger, Ph.D., *Professor of Psychology.*  
 Richard P. Barthol, Ph.D., *Associate Professor of Psychology.*  
 Barry E. Collins, Ph.D., *Associate Professor of Psychology.*  
 Kent Dallett, Ph.D., *Associate Professor of Psychology.*  
 Morton P. Friedman, Ph.D., *Associate Professor of Psychology.*  
 John P. Houston, Ph.D., *Associate Professor of Psychology.*  
 Franklin B. Krasne, Ph.D., *Associate Professor of Psychology.*  
 George E. Mount, Ph.D., *Associate Professor of Psychology.*  
 Donald Novin, Ph.D., *Associate Professor of Psychology.*  
 Jessie L. Rhulman, Ed.D., *Associate Professor of Psychology.*  
 David O. Sears, Ph.D., *Associate Professor of Psychology and Political Science, Acting Associate Director, Institute of Government and Public Affairs.*  
 James P. Thomas, Ph.D., *Associate Professor of Psychology.*  
 S. Carolyn Fisher, Ph.D., *Emeritus Associate Professor of Psychology.*  
 Jackson Beatty, Ph.D., *Assistant Professor of Psychology.*  
 Peter M. Bentler, Ph.D., *Assistant Professor of Psychology.*  
 Bradley D. Bucher, Ph.D., *Assistant Professor of Psychology.*  
 Larry L. Butcher, Ph.D., *Assistant Professor of Psychology.*  
 Brooks J. Carder, Ph.D., *Assistant Professor of Psychology.*  
 Walter J. Dowling, Ph.D., *Assistant Professor of Psychology.*  
 Allan E. Edwards, Ph.D., *Adjunct Assistant Professor of Psychology.*  
 Gaylord D. Ellison, Ph.D., *Assistant Professor of Psychology.*  
 Terry T. Faw, Ph.D., *Assistant Professor of Psychology.*  
 Gilbert Freitag, Ph.D., *Assistant Professor of Psychology.*  
 James E. Gardner, Ph.D., *Assistant Professor of Psychology and Public Health in Residence.*  
 Gerald M. Goodman, Ph.D., *Assistant Professor of Psychology.*  
 John J. Hartman, Ph.D., *Assistant Professor of Psychology.*  
 Barbara A. Henker, Ph.D., *Assistant Professor of Psychology.*  
 Morris K. Holland, Ph.D., *Assistant Professor of Psychology.*

Eric W. Holman, Ph.D., *Assistant Professor of Psychology.*  
 David E. Kanouse, Ph.D., *Assistant Professor of Psychology.*  
 John C. Liebeskind, Ph.D., *Assistant Professor of Psychology.*  
 Donald G. MacKay, Ph.D., *Assistant Professor of Psychology.*  
 Millard C. Madsen, Ph.D., *Assistant Professor of Psychology.*  
 Dennis J. McGinty, Ph.D., *Assistant Professor of Psychology.*  
 Albert Mehrabian, Ph.D., *Assistant Professor of Psychology.*  
 Allan J. Pantle, Ph.D., *Assistant Professor of Psychology.*  
 Kelyn H. Roberts, M.A., *Acting Assistant Professor of Psychology.*  
 Alexander C. Rosen, Ph.D., *Assistant Professor of Psychology and Medical Psychology in Residence.*  
 Edward K. Sadalla, Ph.D., *Assistant Professor of Psychology.*  
 Crayton C. Walker, Ph.D., *Assistant Professor of Psychology.*  
 Bernard Weiner, Ph.D., *Assistant Professor of Psychology.*  
 Thomas D. Wickens, Ph.D., *Assistant Professor of Psychology.*  
 ———, *Assistant Professor of Psychology.*



Armand A. Alkire, Ph.D., *Assistant Clinical Professor of Psychology.*  
 Dorothy V. Anderson, Ph.D., *Assistant Clinical Professor of Psychology.*  
 Anne S. Anzel, Ph.D., *Lecturer in Psychology.*  
 Gertrude Baker, Ph.D., *Associate Clinical Professor of Psychology.*  
 Martha E. Bernal, Ph.D., *Assistant Professor of Medical Psychology in Residence and Lecturer in Psychology.*  
 Frances B. Berres, Ph.D., *Associate Head and Supervisor of Teaching in the Fernald School and Lecturer in Psychology.*  
 Daphne E. Bugental, Ph.D., *Assistant Research Psychologist and Lecturer in Psychology.*  
 Matthew W. Buttiglieri, Ph.D., *Associate Clinical Professor of Psychology.*  
 Donnah S. Canavan, Ph.D., *Lecturer in Psychology.*  
 George Davis, Ph.D., *Lecturer in Psychology.*  
 Darrell C. Dearmore, M.A., *Associate in Psychology.*  
 Jacqueline Goodchilds, Ph.D., *Associate Research Psychologist.*  
 Harry M. Grayson, Ph.D., *Clinical Professor of Psychology.*  
 James A. Green, Ph.D., *Assistant Research Psychologist and Lecturer in Psychology.*  
 Max Hammerton, Ph.D., *Visiting Associate Professor of Psychology.*  
 Charlyne T. Herbert, Ph.D., *Associate Clinical Professor of Psychology.*  
 Evelyn Gentry Hooker, Ph.D., *Research Psychologist.*  
 Harrington V. Ingham, M.D., *Associate Clinical Professor of Psychiatry and Psychology.*  
 Harry Jerison, Ph.D., *Professor of Psychiatry and Psychology.*  
 Margaret Hubbard Jones, Ph.D., *Research Psychologist in Engineering and Psychology.*  
 Lewis L. Judd, M.D., *Assistant Professor of Psychiatry and Psychology in Residence.*  
 Richard A. Kalish, Ph.D., *Associate Professor of Public Health and Psychology in Residence.*  
 Ella A. Kube, Ph.D., *Assistant Research Psychologist.*  
 Leonore Rice Love, Ph.D., *Lecturer in Psychology.*  
 Benson H. Marsten, Ph.D., *Lecturer in Psychology.*  
 Charles D. McCarthy, Ph.D., *Associate Clinical Professor of Psychology.*  
 John H. McCormack, Ph.D., *Associate Clinical Professor of Psychology.*  
 William H. McGlothlin, Ph.D., *Research Psychologist and Lecturer in Psychology.*  
 John W. McKelligott, Ph.D., *Associate Clinical Professor of Psychology.*  
 Sigrid R. McPherson, Ph.D., *Lecturer in Psychology.*

Andre Modigliani, Ph.D., *Visiting Assistant Professor of Psychology.*

Wilbur E. Morley, Ph.D., *Lecturer in Psychology.*

Herbert A. Moskowitz, Ph.D., *Assistant Researcher in Engineering and Psychology.*

Kazuro Nihira, Ph.D., *Assistant Professor in Residence of Psychiatry and Psychology.*

Philip Oderberg, Ph.D., *Lecturer in Psychology.*

James O. Palmer, Ph.D., *Associate Clinical Professor of Medical Psychology and Lecturer in Psychology.*

Thomas W. Richards, Ph.D., *Clinical Professor of Psychology.*

George F. Seacat, Ph.D., *Clinical Professor of Psychology.*

Robert D. Singer, Ph.D., *Visiting Associate Professor of Psychology.*

Madeleine Louise Helene Schlag-Rey, *Assistant Research Psychologist.*

Zanwill Sperber, Ph.D., *Lecturer in Psychology.*

Kathryn West, Ph.D., *Assistant Research Psychologist.*

Barbara Stewart Wilbur, Ph.D., *Associate Clinical Professor of Psychology.*

Seymour Zelen, Ph.D., *Lecturer in Psychology.*

Tamar Zelniker, Ph.D., *Assistant Research Psychologist.*

**Extra-Departmental Requirements.** Biology 1A-1B or Biology 2; Mathematics 2A or Mathematics 3A.

**Premajor Courses.** Psychology 10 and 41.

**Major Courses.** Psychology 110, 115, 120, 125, 135, either 111 or 121, and one of 116, 126, or 136, plus three additional upper division elective courses in psychology. Students are encouraged to consult the bulletin, UNDERGRADUATE PROGRAM IN PSYCHOLOGY, available in the office of the Department of Psychology.

**Related Courses.** Six upper division courses are required, divided among not more than two related departments, with the related departments being anthropology, chemistry, linguistics, mathematics, philosophy, physics, political science, sociology, and zoology.

**Preparation for Graduate Work in Psychology.** Although specific requirements for admission to graduate programs in most universities will be met by the general major, the student should realize that his graduate work may be impeded or prolonged in certain areas of psychology if special preparation is not obtained at the undergraduate level. For this reason, students who plan to continue academic work in psychology beyond the bachelor's degree are urged to consult with their advisers very early in their college careers.

Three particularly specialized areas require emphasis. The first is psychobiology in which strong preparation in biology, chemistry and physics should be obtained. With the permission of an adviser, students indicating an interest in psychobiology will be permitted to substitute two advanced courses in zoology for two of the elective courses in psychology

required for the major. These courses would not count as work in a related department although they would not preclude additional work in zoology to meet that requirement. The second is quantitative psychology. Students interested in quantitative psychology are referred to the joint psychology-mathematics major or, with the consent of an adviser, may substitute two advanced courses in mathematics for two of the elective courses in psychology required for the major. In addition they may elect to take additional courses in mathematics which would count toward the satisfaction of the course requirements in a related department. The third is social psychology. Students interested in this area may, with the consent of an adviser, offer two advanced courses in anthropology, political science, or sociology in place of two elective courses in psychology required for the major, and may in addition offer courses in these areas toward the course requirements in related departments.

Students who expect to study for the Ph.D. would be well advised to devote as many elective courses as possible to the area which is most germane to their field of research interest. They should also plan to give some time to the acquisition of a reading knowledge of one or two foreign languages which might be required for the Ph.D. Our Department currently requires one language or a substitute program, but at many universities two languages are required.

**Transfer Students and Those Changing to Psychology.** Such persons should consult an adviser regarding a program of study designed to absolve extra-departmental and premajor requirements. Psychology 101 is acceptable in lieu of Psychology 10.

**Prerequisites to Courses.** These are listed for each course. For a limited number of courses (see page 475), course 10 (or 101), and 41 are the only prerequisites.

**Honors Program in Psychology.** Students who have distinguished themselves in the premajor courses and in other academic work will be considered for participation in the honors program. Admission into the program is based upon recommendations by the Honors Program Committee; students are selected usually at the beginning of their junior year. Participation in the program entails permission to enroll in the honors seminar in psychology and to pursue self-study and research in the area of the student's choice under the tutorial guidance of one or more members of the committee.

**Psychology-Mathematics Curriculum.** This curriculum is described on page 77.

### Graduate Requirements

All students should obtain from the departmental office a statement of the graduate requirements in psychology.

The Department offers the M.A. and Ph.D. degrees in psychology. (See page 464.) For the Ph.D. degree, all students are required to obtain thorough grounding in research methodology and psychological theory. Specialized training is available in such areas of psychology as child development, clinical, comparative, engineering, human and animal learning, industrial, mathematical, measurement, perception and psychophysics, personality and psychopathology, physiological, psychometrics and social psychology.

### Admission to the Graduate Program

In addition to meeting the general graduate requirements listed on page 29 of this bulletin, students must be admitted to the Department by a selection committee within the Department. Graduate enrollment is limited and candidates will be chosen on the following bases: (1) prior scholastic performance; (2) ratings and recommendations by professors and other individuals; (3) autobiographical material; (4) scores on the Graduate Record Examination (verbal, quantitative and psychology advanced test) and on the Miller Analogies Test. Application materials may be obtained by writing to the Department of Psychology, Admissions Committee, University of California, Los Angeles, California 90024. The completed departmental

forms and transcripts must be received by February 15 for consideration for the following fall quarter. Normally, all applicants will have had an undergraduate major in psychology, but outstanding students who have majored in other areas will be considered. Late applications will be considered but preference must be given to those who meet the February 15 deadline.

### Requirements for the M.A. and Ph.D. Degrees

All entering graduate students must during their first year take certain core courses and otherwise prepare themselves for comprehensive examinations in a number of specified areas. Evaluation of the student's total performance during his first year will determine whether he will be permitted to continue his studies toward the Ph.D. degree. A student entering graduate work with an M.A. degree or advanced graduate standing from another university will not automatically be exempted from any part of our graduate program. He may petition to substitute prior course work for departmental requirements or to demonstrate equivalent knowledge through examinations.

**M.A. Degree.** The Department does not admit candidates for the M.A. degree only, and the M.A. degree is not required of candidates for the Ph.D. degree; however, graduate students preparing for the Ph.D. normally qualify and apply for the M.A. degree after satisfactory completion of the core courses and area examinations. The Department follows the Comprehensive Examination plan. See page 155. A thesis is not required for the M.A. degree.

**Ph.D. Degree.** Eligibility for an oral qualifying examination and admission to candidacy requires prior qualification in the departmental core courses, qualification in comprehensive examinations in areas of the candidate's specialization, and the passing of a reading comprehensive examination in one approved foreign language. Some students may substitute a course program in research methods for the language requirement. The oral qualifying examination is administered by a committee of not less than five persons, three from the Department and two from other departments. Each student must complete a satisfactory doctoral dissertation approved by his adviser and other members of the doctoral committee, after which he must pass a final oral examination on the dissertation and its implications.

## Fellowships, Scholarships, Assistantships, and Stipends

At the present time almost all graduate students obtain work in the profession as assistants or trainees, or receive one of the many fellowships available within and without the University. Graduate students may also receive some financial assistance by serving as course readers.

### Lower Division Courses

#### 10. Introductory Psychology.

(Formerly numbered 1A.) A general introduction including the topics of learning, perception, thinking, intelligence and personality.

Mr. Gengerelli, Mr. Parducci

#### 12. Introductory Physiological Psychology.

An introduction to psychobiological problems.

Mr. Ellison, Mr. Gengerelli, Mr. Liebeskind

#### 41. Elementary Statistics in Psychology.

(Formerly numbered 141.) Prerequisites: Mathematics 2A or 3A. Students who have credit for any other course in statistics will normally receive one-fourth course credit for the course. Full course credit may be granted by petition where it is judged that the overlap of contents is insignificant. Measures of central tendency, variability and correlations. Applications of statistical inference to research in psychology. Reliability and validity of psychological tests and measurements.

Mr. Comrey, Mr. Holman, Mr. Walker

#### 70. Psychology of Human Relations.

An introduction to the theory and principles of personal growth and interpersonal effectiveness. Both intra- and interpersonal dynamics are reviewed.

### Upper Division Courses

Psychology 10 (or 101), and 41 are prerequisites to all courses except 149.

#### 101. Principles of Psychology.

Open to upper division students who do not have credit for course 10. A critical discussion of the basic topics in psychology.

Mr. Gengerelli

#### 102. History and Systems of Psychology.

(Formerly numbered 120.) Prerequisite: senior standing or consent of the instructor. An historical and systematic analysis of psychological thought and points of view.

Mr. Jones

#### 110. Fundamentals of Learning.

(Formerly numbered 137.) Prerequisite: course 41 (formerly numbered 141). Experimental findings on animal and human conditioning; retention and transfer of training; the relation of learning and motivation. The course is intended to provide an empirical basis for theory and research in this area.

Mr. Houston, Mr. Seward

#### 111. Learning Laboratory. (½ course)

Prerequisite or concurrent: course 110. Laboratory experience with techniques in the study of learning, especially with animals.

Mr. Houston, Mr. Seward

#### 112A-112D. Preseminars in Learning.

Prerequisite: course 110. May be taken independently and in any order. Advanced topics in learning, detailed analyses of theories and research in selected areas, for example:

##### 112A. Human Learning.

Acquisition, retention, and transfer of verbal and nonverbal human learning.

Mr. Dallett

##### 112B. Theories of Learning.

Critical discussion of the major theories in the light of experimental evidence.

Mr. Seward

##### 112C. Thinking.

(Formerly numbered 135.) An analysis of experimental studies of problem solving, reasoning, insight, concept formation, and related topics.

Mr. Maltzman

##### 112D. Motivation.

Theories and experimentally determined facts concerning drives, needs, preferences, and desires.

Mr. Seward

#### 115. Physiological Psychology.

(Formerly numbered 108.) Prerequisites: Biology 1A-1B, course 41 (formerly numbered 141) or consent of the instructor. Integrative activities, receptor and effector processes in relation to neuromuscular structure and function. Facts, problems and methods.

Mr. Ellison, Mr. Gengerelli, Mr. Liebeskind

#### 116. Physiological Psychology Laboratory.

(½ course)

Prerequisite or concurrent: course 115. Laboratory experience with various topics in physiological psychology.

Mr. Ellison, Mr. Liebeskind, Mr. MacKay

#### 117A-117B-117C. Preseminars in Physiological Psychology.

(Formerly numbered 138 and 150A.) Prerequisite: course 115 or Zoology 109. May be taken independently and in any order. Advanced topics in physiological psychology, for example:

##### 117A. Feeling and Emotion.

The nature and basis of the affective factor in life with particular emphasis on the critical evaluation of affective theory.

Mr. Wenger

##### 117B. Comparative Psychobiology.

A survey of the determinants of species-specific behavior including genetic influences and learning.

Mr. Krasne

##### 117C. Advanced Topics.

Advanced topics in brain and behavior. May be repeated for credit with permission of the instructor.

The Staff

#### 120. Perception.

(Formerly numbered 131.) Prerequisite: course 41. Methods and approaches to the study of perception. Experimental results, theoretical interpretations, and demonstrations.

Mr. Carterette, Mr. Dowling, Mr. Friedman

#### 121. Perception Laboratory. (½ course)

Prerequisite or concurrent: course 120. Laboratory experience with various topics in perception.

Mr. Carterette, Mr. Dowling, Mr. Friedman

#### 122. Language and Communication.

(Formerly numbered 142.) Prerequisite: course 41 or consent of the instructor. A survey of language behavior, communication and speech perception, including acquisition, sequential structure, and semantic aspects. Recent developments in linguistics, theory of information transfer, analysis and synthesis

of speech. Social communication. Aphasia and speech pathology. Animal communication.

Mr. Carterette, Mr. Mehrabian

### 123. Psycholinguistics.

A survey of current theory and research in psycholinguistics: the description of language in generative grammars; the acquisition of language by children; experiments on speech recognition, production and comprehension; errors in speech perception and production; speech physiology and pathology.

Mr. MacKay

### 124. Preseminars in Perception.

Advanced consideration of special topics. May be repeated for credit.

### 125. Personality.

(Formerly numbered 148.) Prerequisite: course 41. The physiological, behavioral, and cultural role of perception, learning, and motivation in personality. These topics will be discussed in the context of current research and major theories.

Mr. Comrey, Mr. Mehrabian, Mr. Weimer

### 126. Personality Laboratory. (½ course)

Prerequisite or concurrently with special permission: course 125. Laboratory experience with various topics in personality.

Mr. Mehrabian

### 127. Abnormal Psychology.

(Formerly numbered 188.) Study of the dynamics and prevention of abnormal behavior, including neuroses, psychoses, character disorders, psychosomatic reactions and other abnormal personality patterns.

Mr. Goldstein, Miss Henker

### 128. Structure of Individual Differences.

(Formerly numbered 188.) The logical and experimental approaches to human aptitudes, abilities, and interests as used in counseling. Mental organization, physiological and psychological traits, individual and group educational-vocational-personality characteristics, derivation of interest and ability pattern, pattern analysis and its counseling applications. (Nonmajors see course 428.)

Mr. Hahn

### 129A-129B-129C. Preseminars in Personality.

(Formerly numbered 129.) Prerequisite: course 125. Preseminars may be taken independently and in any sequence. All involve treatment of special and advanced topics in personality.

#### 129A. Personality Measurement.

The rational, methods and content of studies dealing with the problems of describing persons in terms of a limited set of dimensions. Detailed consideration of research literature dealing with a few representative personality dimensions.

Mr. Mehrabian

#### 129B. Personality Dynamics.

Detailed conceptual examination of one or two areas of personality in which the main and interactive effects of personality and situational variables have been investigated. Personality is related to the study of psychological processes, particularly motivation. Includes an examination of current research literature.

Mr. Weiner

#### 129C. Personality and Cognition.

Theoretical and experimental analyses of cognitive processes such as imagery, attention, language and memory and their implication for theories of personality.

Mr. Mehrabian, Mr. Sadalla

### 130. Developmental Psychology.

(Formerly numbered 112.) An elaboration of the developmental aspects of physical, mental, social, and emotional growth from birth to adolescence.

Mr. Madson

### \*131. Developmental Psychology Laboratory.

(½ course)

Prerequisite or concurrent: course 130. Observation and experimentation in developmental psychology.

### 132A. Learning Disorders.

(Formerly numbered 167A.) An examination of the psychological factors underlying the understanding, diagnosis and treatment of reading and other learning disorders in children, adolescents and young adults.

Mr. Adelman

### 132B. Learning Disorders: Laboratory.

(½ to 1 course)

(Formerly numbered 167B.) Prerequisite or concurrently: course 132A. This course provides supervised laboratory experience with remedial cases in the Fernald School. May be repeated for credit to a maximum of two courses.

Mr. Rubenstein

### 133A-133B-133C. Preseminars in Developmental Psychology.

Prerequisite: course 130 or consent of the instructor. May be taken independently and in any order. Treatment of special and advanced topics in developmental psychology, for example:

#### 133A. Adolescence.

(Formerly numbered 113.) The physical, psychological and social development of the adolescent.

Miss Rihulman

#### 133B. Exceptional Children.

(Formerly numbered 161.) An analysis of psychological factors pertaining to the etiology and treatment of deviant behavior in children. Emphasis will be on learning theory analysis of psychotic children.

Mr. Lovas

#### \*133C. Aging.

The psychological problems of later maturity and old age.

### 134. Educational Psychology.

(Formerly numbered 110.) A general survey of the basic principles of psychology that are pertinent to education. Includes a study of growth and development, abilities, intelligence, social and emotional factors, and principles of learning.

Miss Rihulman

### 135. Social Psychology.

(Formerly numbered 145.) Prerequisite: course 41. The interrelationships between the individual and his social environment. Social influences upon motivation, perception and behavior. The development and change of attitudes and opinions. Psychological analysis of small groups, social stratification and mass phenomena.

Mr. Centers, Mr. Collins, Mr. Raven

### 136. Social Psychology Laboratory. (½ course)

Prerequisite or concurrent: course 135. Laboratory experience with such topics as small group behavior, attitude measurement, and interpersonal influence.

Mr. Kelley, Mr. Raven

\* Not to be given, 1970-1971.

**137A-137B-137C. Preseminars in Social Psychology.**

Prerequisite: course 135. Advanced topics in social psychology. May be taken independently and in any order.

**137A. Group Behavior.**

Psychology of interdependence, group membership, leadership, and social influence. Mr. Kelley

**137B. Attitude Formation and Change.**

Effects of propaganda, personal influence, socialization and social structure on private attitudes and public opinion. Mr. Sears

**137C. Survey Research in Psychology.**

The nature of attitudes and opinions, and their measurement by means of attitude scales and public opinion surveys. Class projects and field work. Mr. Centers

**142. Advanced Statistical Methods in Psychology.**

(Formerly numbered 107.) Prerequisite: course 41. The application of higher statistical methods to psychological data. Mr. Comrey, Mr. Walker

**143. Foundations of Psychological Investigation.**

(Formerly numbered 106.) Prerequisite: course 41. Outline and examination of concepts associated with psychological investigation and the interpretation of results. Readings, discussions and reports, individual and class projects. Mr. Mount

**144. Psychological Tests and Evaluation.**

(Formerly numbered 111.) Prerequisite: course 41. Further study of the principles of measurement, stressing basic concepts. Application to problems of test construction, administration, and interpretation. Mr. Broen

**148. Personnel and Industrial Psychology.**

(Formerly numbered 185 and 187.) Students who have credit for either the courses formerly numbered 185 or 187 will receive one-half course credit for this course. Introduction to the applications of psychology in industry and business. Mr. Case

**149. Problems in Human Relations.**

(Formerly numbered 181.) Understanding human relations problems and developing skills in interpersonal relations. Topics include the effective use of human resources; group management and leadership skills; interviewing, counseling, and conference techniques. Mr. Barthol

**184. Disorders of Human Communication.**

(Formerly numbered 162.) A clinical approach to speech problems with emphasis on stuttering and neurological disorders and their treatment. Mr. Sheehan

**188A-188B. Psychology of Music.**

(Formerly numbered 172A-172B.) A study of the psychological factors and problems in music from the points of view of the listener, a performer, and composer. Mr. Dowling

**189. Psychological Approaches to the Social Sciences.**

(Formerly numbered 147.) An analysis of the contribution of current psychological theory and research to the understanding of selected historical, social, and political problems. Mr. Sears

**190A-190B-190C. Honors Course.**

Prerequisite: invitation by departmental honors committee. Opportunity for the development of creative ideas and their implementation by experimental research. Mr. Houston, Mr. Sears

**198. Senior Seminars in Psychology.**

Prerequisite: senior standing in psychology and consent of the instructor. Seminars on special topics according to staff interests.

**199. Special Studies in Psychology. (½ to 1 course)**

Prerequisite: upper division standing and consent of the instructor. May be repeated for a total of four full courses.

**Graduate Courses****200A. Learning I.**

Emphasis is primarily on animal and human conditioning. The Learning Staff

**200B. Learning II.**

A critical analysis in contemporary theory and research related to complex processes, primarily human. The Learning Staff

**202. Verbal Behavior and Thinking.**

(Formerly numbered 218.) Experimental research and theories dealing with such topics as meaning, verbal conditioning, problem solving, originality, and normal and schizophrenic thinking. Mr. Maltzman

**204A-204F. Seminar in Critical Problems in Learning.**

(Formerly numbered 290.) May be taken independently and in any order. Critical problems will be drawn from such as the following:

**\*204A. Conditioning.**

Consideration of selected empirical topics relevant to operant and respondent conditioning paradigms.

**204B. Human Learning.**

Acquisition, retention, and transfer of verbal and nonverbal human learning. Mr. Dallett

**204C. Behavior Theory.**

Theoretical and experimental analyses of orienting and defensive reflexes, and their implications for theories of learning, motivation, and abnormal behavior. Mr. Maltzman

**204D. Behavior Theory.**

A continuation of 204C. Mr. Maltzman

**\*204E. Discrimination Learning.**

A review and detailed examination of contemporary viewpoints of discrimination learning with emphasis on the notion of attention as a construct in these theories.

**204F. Aversive Motivation.**

Analysis of recent theories of aversive motivation, including avoidance behavior, punishment, stress, and interactions between appetitive and aversive motivation. Mr. Carder

**205. Physiological Correlates of Behavior.**

(Formerly numbered 204.) Prerequisite: Section 1: graduate standing; Section 2: course 115 or equivalent and consent of the instructor. The physiological substrate of behavior and the neural and endocrine mechanisms which underlie psychological phenomena and behavior. New concepts of structural and functional organization in the nervous system and the ways these relate to behavioral and neurological dysfunction. The Physiological Staff

\* Not to be given, 1970-1971.



**206. Psychophysiology of Brain Function.**

(Formerly numbered 228.) *Modern concepts of the functional organization of the brain with particular reference to psychological phenomena and behavior.* Recent advances in neurophysiology and electroencephalography bearing on perception, attention, drive, sleep-wakefulness, levels of consciousness, etc. Some emphasis on pathology of behavior resulting from brain injury. Mr. Lindsley

**207A-207B-207C. Seminar in Physiological Psychology.**

(Formerly numbered 253A-253B.) Prerequisite: course 115 or the equivalent.

Mr. Ellison, Mr. Gengerelli

**\*208. Seminar in Comparative Psychobiology.**

Mr. Krasne

**209. Laboratory Methods in Physiological Psychology.**

Prerequisite: consent of the instructor. Surgical skills, bioelectric instrumentation and experimental techniques, data analysis and interpretation.

The Physiological Staff

**211. Perception.**

(Formerly numbered 201.) Basic experiments and theories of perception and judgment, with applications to learning, motivation, and personality. Laboratory demonstrations and individual experiments.

The Perception Staff

**212. Advanced Perception.**

Advanced study of topics in perception with emphasis on theories of perception. Mr. Carterette

**213. Psychology of Vision.**

An advanced treatment of psychophysiology and psychophysics of vision with special attention to modern theories. Mr. Thomas

**214. Psychology of Audition.**

An advanced treatment of the psychophysiology and psychophysics of audition with special attention to modern theories. Mr. Carterette

**\*215. Psychology of Somesthesia and the Chemical Senses.**

Prerequisite: course 211. A consideration of the current status of research on the senses other than vision and audition. Mr. Jones

**\*216. Critical Problems in Perception.**

(Formerly numbered 282.) Mr. Friedman

**220. Social Psychology.**

(Formerly numbered 205.) An intensive consideration of the concepts, theories, and major problems in social psychology. The Social Staff

**221. Seminar in Attitude Formation and Change.**

(Formerly numbered 263A-263B.) Prerequisite: course 220, 227, or consent of the instructor. Social psychological research and theories on opinions and attitudes. Effects of mass communication, social factors in assimilation of information and influence. Mr. Sears

**222A-222B. Seminar in Group Behavior.**

(Formerly numbered 264A-264B.) Prerequisite:

\* Not to be given, 1970-1971.

course 220, 227, or consent of the instructor. Special topics in interpersonal relations and group dynamics. Power control, structure and organization, group functioning. Mr. Raven

**223. Survey Methods in Psychology.**

(Formerly numbered 266.) Prerequisite: course 220, 227, or consent of the instructor. A critical review of the theory and practice of large-scale sampling, measurement, and analysis of beliefs, attitudes, and other psychological variables. Mr. Centes

**224. Experimental Methods in Social Psychology.**

(Formerly numbered 268.) Prerequisite: course 220, 227, or consent of the instructor. A critical review of laboratory techniques and problems of experimental control and measurement encountered in research on social psychological phenomena. Mr. Collins

**225. Seminar: Critical Problems in Social Psychology.**

(Formerly numbered 267.) Prerequisite: course 220, 227, or consent of the instructor. May be repeated for credit with consent of the instructor.

Mr. Centers, Mr. Kelley

**\*226. Seminar in Behavioral Science and the Law.**

(Same as Law 333.) Prerequisite: consent of the instructor. Critical examination of selected issues of mutual concern to behavioral scientists and legal scholars such as decision-making processes, criminal sentencing, effect of deterrents, privacy and consent in experimentation.

**227. Advanced Issues in Social Psychology.**

Prerequisite: course 220 or consent of the instructor. An intensive analysis of three advanced issues in social psychology drawn from such topics as small groups, attitude change, social psychology of urban affairs, social psychology of education, race relations, methodology. Recommended for students selecting Social Psychology as a minor or cognate area.

The Social Staff

**228. Seminar in Political Psychology.**

(Same as Political Science 224G.) Prerequisite: course 220 or consent of the instructor. Examination of political behavior, political socialization, personality and politics, racial conflict, and the analysis of public opinion on these issues. Mr. Sears

**231. Seminar in Language and Communication.**

(Formerly numbered 283.) Prerequisites: courses 260A-260B. Mr. Dowling, Mr. MacKay

**232. Seminar in Judgment.**

Consideration of topics in human judgment. Mr. Parducci

**235. Personality.**

(Formerly numbered 202.) A survey of cognitive, analytic, and learning theory approaches to the study of personality. Emphasis will be on the intensive exploration of selected concepts and related research. The Personality Staff

**236. Personality Theories.**

(Formerly numbered 222A-222B.) A survey of the theoretical views of Freud, Jung, Adler, Rank, and various modern writers, including Allport, Lewin, Murray and Murphy. Mr. Lehner

**\*237. Survey of Projective Methods in Personality Assessment.**

(Formerly numbered 224.) Survey of theories and fields of application of projective methods, and supervised practice in techniques. For nonclinical psychology students. Mr. Sheehan

**\*238. Seminar in Mental Measurements.**  
(Formerly numbered 252.) Mr. Comrey

**239. Experimental Research in Personality.**

Prerequisite: course 202. A detailed analysis of some of the current research in personality. The relation of personality to the process areas will be stressed. Students will conduct independent research projects. Mr. Weiner

**240. Developmental Psychology.**

(Formerly numbered 231.) A consideration of the special problems of the control and measurement of the behavior of children as well as the young of other organisms with emphasis on providing basic research relevant to both clinical and research work with children. Mr. Jeffrey

**241. Growth and Development During Adult Years.**

Theory and research of the adult age group—21 to senility. Social stratification; genetics; motivational changes by age and sex; changes in aptitudes and abilities; cultural and subcultural influences. Mr. Hahn

**242. Seminar in Developmental Psychology.**

(Formerly numbered 254.) Prerequisite: course 240 or equivalent and consent of the instructor. Selected topics. May be repeated for credit with consent of the instructor. Mr. Jeffrey, Mr. Madsen

**243A-243B. Seminar in Practical Issues in Developmental Psychology.**

(Formerly numbered 255A-255B.) Prerequisite: course 240 or equivalent, and consent of the instructor. Credit and grade to be given only upon completion of 243B. Mr. Nakamura

**244. Critical Problems in Developmental Psychology.**

Prerequisites: course 240 or equivalent, and consent of the instructor. The course will be concerned with current problems and will vary from time to time depending upon the interest of the class and instructor. May be repeated for credit with consent of the instructor. Mr. Madsen

**245. Mathematical Psychology.**

(Formerly numbered 208.) Construction and analysis of mathematical models of behavior. Emphasis on applications to research in learning, perception, social, and other areas. Mr. Hólman

**246. Seminar in Advanced Mathematical Psychology.**

(Formerly numbered 280.)

**247A-247B. Computer Techniques in the Behavioral Sciences.**

(Formerly numbered 292.) Introduction to statistical and mathematical techniques applicable to behavioral sciences which would not be feasible

without digital computers. Topics discussed will include special statistical methods, Monte Carlo simulation, and information processing models. Mr. Walker

**250A. Advanced Psychological Statistics.**

(Formerly numbered 203A.) Review of fundamental concepts. Basic statistical techniques as applied to the design and interpretation of experimental and observational research. Mr. Bucher

**250B. Advanced Psychological Statistics.**

(Formerly numbered 203B.) Advanced experimental design and planning of investigations. Mr. Bucher

**251A-251B. Research Methods.**

(Formerly numbered 206.) Credit and grade to be given only upon completion of 251B. Students will design and conduct original research projects under the supervision of the instructor in charge. The Staff

**252. Quantitative and Laboratory Methods in Psychology.**

(Formerly numbered 207.) Fundamentals of measurement, laboratory techniques and instruments, sources and types of error, treatment and presentation of data, problems in the design and interpretation of experiments in representative areas of laboratory investigation. Mr. Mount

**253. Factor Analysis.**

(Formerly numbered 209.) Theory and practice of factor analysis in psychological research. Methods of factor extraction and rotation. Applications of computers to computations in factor analysis. Mr. Comrey

**254. Seminar in Psychological Scaling.**

(Formerly numbered 210.) Theory of measurements, law of comparative judgment, methods of unidimensional scaling, multidimensional scaling, and related topics of current interest. Mr. Comrey

**255. Quantitative Aspects of Assessment.**

(Formerly numbered 211.) Fundamental assumptions and equations of test theory. Current problems in assessment. Mr. Bentler

**256. Seminar in Critical Problems in Psychological Measurement.**

(Formerly numbered 281.) Critical examination of issues in the major approaches to psychological measurement; relation of psychological methods and data to a general theory of measurement. Mr. Mount

**260A. Psycholinguistics I. Seminar.**

Prerequisite: course 123 and Linguistics 230. Current psycholinguistic theory and research problems; coding and decoding, psycholinguistic parameters in language learning; speech recognition and perception. Mr. Kelley, Mr. MacKay

**260B. Psycholinguistics II. Seminar.**

Prerequisite: course 260A. Continuation of course 260A. Mr. Dowling, Mr. MacKay

**261A-261B-261C. Advanced Industrial Psychology.**

(Formerly numbered 235A-235B.) Selection and training of employees, factors influencing efficiency of work. Mr. Barthol

**\*262. Special Problems in Industrial Psychology.**

(Formerly numbered 235.) Mr. Barthol

\* Not to be given, 1970-1971.

**270. Issues and Concepts of Clinical Psychology.**

(Formerly numbered 217A.) Mr. Broen

**271A-271B-271C. Clinical Psychological Methods.**

(Formerly numbered 230A-230B.) Methods and procedures of psychological interviewing, assessment, therapy, and behavior modification in the clinical situation including supervised clinical laboratory.

The Clinical Staff

**272A-272B-272C. Psychotherapy.**

(Formerly numbered 257A-257B.) Course 401 must be taken concurrently, except with consent of instructor.

272A. Introduction. Mr. Sheehan

272B. Psychotherapy with Adults. Mr. Ingham

272C. Psychotherapy with Children. Mrs. Love

**273. Advanced Clinical Interpretation.**

(Formerly numbered 225.) Mr. Goldstein

**274A-274B. Group Therapy Dynamics.**

(Formerly numbered 257C.) Mr. Lehner

**275A-275B. Seminar in Abnormal Psychology.**

(Formerly numbered 258A-258B.) Mr. Coleman

**276A-276B. Seminar in Learning Disorders.**

(Formerly numbered 259 and same as Education 263B-263C.) Mr. Coleman

**\*277. Seminar in Clinical Psychology and Speech Pathology.**

(Formerly numbered 262.) Mr. Sheehan

**278A-278B. Seminar in Motivation, Conflict and Neurosis.**

Mr. Feshbach

**279A-279B. Seminar in Experimental Research in Psychopathology.**

(Formerly numbered 293.) Mr. Rodnick

**280. Seminar in Experimental Psychodynamics.**

Mr. Broen

**281. Seminar in Behavior Therapy.**

Mr. Lovaa

**298. Special Problems in Psychology.**

The content will depend upon the interests of the particular instructor. The Staff

## Professional Courses

**401. Field Work in Clinical Psychology.**

(1 or 2 courses)

(Formerly numbered 279A-279B, Section 1.) Prerequisite: courses 271A-271B-271C. Students on practicum assignments are required to register for this course each quarter. Exception with consent of Clinical Program Committee. The Clinical Staff

**402. Field Work in Speech Pathology.**

(1 or 2 courses)

(Formerly numbered 279A-279B, Section 2.) Prerequisite: consent of the instructor. Practical work in hospitals and clinics in diagnostic testing and psychotherapy with speech disorders. Mr. Sheehan

\* Not to be given, 1970-1971.

**403. Field Work in Counseling Psychology.**

(1 or 2 courses)

(Formerly numbered 277A-277B.) Prerequisite: consent of the instructor. Internship in the Student Counseling Center, which includes psychometrics, observation of counseling, preparation of case materials for counselors, record keeping, test scoring, case discussions, and participation in other service activities. Minimum of ten hours per week, including one or two hours of staff meetings and conferences.

The Staff

**410. Problems in Professional Communication.**

(Formerly numbered 227B.) Study of the theoretical and practical problems arising from the use of psychological methods and instruments on case work material. Emphasis on psychoevaluation and nonverbal communication. For graduate students in psychology and related disciplines: enrollment limited. Consent of the instructor required. Mr. Hahn

**411. Personal Evaluation.**

(Formerly numbered 227A.) Prerequisite: consent of the instructor. Seniors and graduate students with appropriate backgrounds in psychology. Assessment, evaluation, and psychoevaluation of individuals in a case study setting. Includes 30 hours of volunteer hospital services. Mr. Hahn

**\*412. Psychological Interviewing and Case Study Methods.**

(Formerly numbered 144.) Procedures, methods, and problems in the collection of personal data in the interview situation.

**\*428. Assessment of Individual Differences.**

(Formerly numbered 188.) Open to nonmajors only. The logical and experimental approaches to human aptitudes, abilities and interests as used in counseling. Mental organization, physiological and psychological traits, individual and group educational-vocational-personality characteristics, derivation of interest and ability patterns, pattern analysis and its counseling applications.

**451. Internship in Clinical Psychology. (1 or 2 courses)**

(Formerly numbered 401A-401B, Section 1.) Prerequisite: course 401. Open only to students who have passed departmental qualifying examination. May be repeated for credit. The Clinical Staff

**452. Internship in Counseling Psychology.**

(Formerly numbered 401A-401B, Section 2.) The Staff

**454. Internship in Industrial Psychology. (½ to 1 course)**

(Formerly numbered 401A-401B, Section 3.) The Staff

## Individual Study and Research

**596. Directed Individual Research and Study in Psychology. (½ to 2 courses)**

One course required during second year of graduate study. One course in 596 or 599 required during each succeeding year of graduate study. (Terminal M.A. candidates are excused from these requirements.) The Staff

**597. Individual Studies. (½ to 1 course)**

Intended primarily for preparation for Ph.D. qualifying examinations. May be required by some area committees as prerequisite for taking qualifying examinations.

The Staff

**599. Research on Dissertation. (½ to 2 courses)**

Prerequisite: Satisfactory performance in qualifying examinations. One course required during each year following passing of qualifying examinations.

The Staff

**Psychology Clinic**

The Psychology Clinic was established in 1949 in Franz Hall by the Department of Psychology as a training and research center in clinical psychology. It has specialized facilities for the investigation, assessment and treatment of a variety of psychological disabilities and adjustment problems of children, adolescents and adults of the greater Los Angeles community.

The Clinic provides a broad range of psychological services to clients including individual, group and family therapy, behavior modification procedures and consultation to agencies in the community. The emphasis on systematic research investigation in the Clinic leading to new knowledge and the improvement of clinical psychological procedures is in keeping with a primary function of a University-based clinic. The number and types of clients served are consonant with this goal. Apart from those investigations related directly to the professional services for the clients, there are a number of research programs in the clinic which reflect the current interests of the staff, such as 1) communication patterns in the family constellation relevant to both the development and the amelioration of behavioral disturbance, 2) the development of innovative techniques of behavior modification which are effective in treating various psychological problems and, 3) exploration of new modes of delivering psychological services to currently unserved segments of the population.

These service and research functions serve as the basis for the professional education and training of clinical psychologists as an integral part of their graduate study in the Department of Psychology. The Clinic also provides training experiences to students of other mental health professions, such as social work. Although the Clinic is staffed primarily by psychologists, some staff mem-

bers are drawn from other professions, such as clinical social work, psychiatry, pediatrics and special education.

**Fernald School**

The Fernald School (formerly the Psychology Clinic School), a facility of the Department of Psychology, was established in 1921 as a research and training center for the study, diagnosis, and treatment of learning disabilities.

The uniqueness of the facility lies in its lively experimental atmosphere, in its varied population, in the scope of its training, demonstration and research programs and in its interdisciplinary approaches in which the talents of teachers, clinical psychologists, school counselors, and social workers are integrated and brought to bear upon the student's learning difficulties. The School's current focus is on those children with average or better intelligence who are functioning significantly below grade level in basic school skills and school achievement.

The Fernald School offers observation, classroom participation and intervention research and other training opportunities to graduates and undergraduates in many fields, notably psychology, education and social welfare. Fellowships are available for graduate students in psychology and education. Two courses focusing on learning disabilities, Psychology 132A and 132B, are specifically associated with the Fernald School programs. Psychology 132A provides the opportunity to examine factors concerning etiology, diagnosis and treatment of learning difficulties. Psychology 132B affords the opportunity to observe and participate, under supervision, in the remediation of the academic deficiencies of Fernald School students.

The Fernald School population includes approximately 100 students, enrolled in regular and small group classroom programs, and an average of 200 children, adolescents and adults who are seen in individual and small group tutoring programs. In addition, another 250 individuals are seen for diagnostic evaluation each year. The research activities, based on these populations, are directed toward an analysis of the processes mediating learning difficulties and toward an evaluation of the effectiveness of various therapeutic and remedial programs.

## ■ PUBLIC HEALTH

(Department Office, 51-269 Center for the Health Sciences)

Roslyn B. Alfin-Slater, Ph.D., *Professor of Nutrition.*

Ruth Boak, Ph.D., M.D., *Professor of Medical Microbiology and Immunology, Professor of Pediatrics and Professor of Public Health.*

Lester Breslow, M.D., M.P.H., *Professor of Preventive Medicine and Public Health and Professor of Public Health.*

Albert F. Bush, M.S., *Professor of Engineering and Professor of Public Health.*

John M. Chapman, M.D., M.P.H., *Professor of Preventive Medicine and Public Health, Professor of Medical Microbiology and Immunology and Professor of Epidemiology.*

Wilfred J. Dixon, Ph.D., *Professor of Biomathematics and Professor of Biostatistics.*

Gladys A. Emerson, Ph.D., *Professor of Nutrition.*

Lenor S. Goerke, M.D., M.S.P.H., *Professor of Public Health and Professor of Preventive Medicine and Public Health.*

Ralph Goldman, M.D., *Professor of Medicine and Professor of Public Health.*

Carl E. Hopkins, Ph.D., M.P.H., *Professor of Public Health.*

Raymond J. Jessen, Ph.D., *Professor of Business Administration and Professor of Public Health.*

Edward B. Johns, Ed. D., *Professor of Health Education.*

Alfred H. Katz, M.A., D.S.W., *Professor of Public Health and Professor of Social Welfare.*

John W. Knutson, D.D.S., Dr.P.H., *Professor of Preventive Dentistry and Professor of Public Health.*

Frank J. Massey, Jr., Ph.D., *Professor of Biostatistics and Professor of Preventive Medicine and Public Health.*

Edward L. Rada, Ph.D., *Professor of Economics in Public Health.*

Leo G. Reeder, Ph.D., *Professor of Public Health and Professor of Sociology.*

Milton I. Roemer, M.D., M.P.H., *Professor of Public Health and Professor of Preventive Medicine and Public Health.*

Marian E. Swendseid, Ph.D., *Professor of Nutrition and Professor of Biological Chemistry.*

George Tarjan, M.D., *Professor of Psychiatry and Professor of Public Health in Residence.*

Daniel M. Wilner, Ph.D., *Professor of Public Health and Professor of Preventive Medicine and Public Health (Chairman of the Department).*

Henry N. Work, M.D., *Professor of Psychiatry and Professor of Public Health.*

Telford Work, M.D., M.P.H., D.T.M.&H., *Professor of Infectious and Tropical Diseases.*

John F. Kessel, Ph.D., *Emeritus Professor of Infectious Diseases and Research Parasitologist.*

Frank F. Tallman, M.D., *Emeritus Professor of Psychiatry and Emeritus Professor of Public Health.*

A. Ralph Barr, Sc.D., *Associate Professor of Public Health.*

Virginia A. Clark, Ph.D., *Associate Professor of Public Health.*

Olive Jean Dunn, Ph.D., *Associate Professor of Biostatistics and Associate Professor of Biomathematics.*

Richard Kalish, Ph.D., *Associate Professor of Public Health in Residence.*

Agnes A. O'Leary, R.N., M.P.H., *Associate Professor of Public Health Nursing and Lecturer in Public Health.*

Robert S. Poggrund, Ph.D., *Associate Professor of Public Health in Residence.*

John F. Schacher, Ph.D., *Associate Professor of Public Health in Residence.*

Elizabeth Stern, M.D., *Associate Professor of Public Health in Residence.*

- Abdelmonem A. Affi, Ph.D., *Assistant Professor of Biostatistics and Assistant Professor of Biomathematics.*
- Lawrence R. Ash, Ph.D., *Assistant Professor of Public Health in Residence.*
- J. Alfred Cannon, M.D., M.P.H., *Assistant Professor of Psychiatry and Assistant Professor of Public Health in Residence.*
- Potter C. Chang, Ph.D., *Assistant Professor of Biostatistics in Residence.*
- Alfred J. Clark, Ph.D., *Assistant Professor of Public Health in Residence.*
- Donn L. Cochran, Ed.D., *Assistant Professor of Public Health in Residence.*
- James P. Cooney Jr., Ph.D., *Assistant Professor of Hospital Administration.*
- David P. Discher, M.D., *Assistant Professor of Public Health and Assistant Professor of Preventive Medicine and Public Health.*
- Donald Du Bois, Dr.P.H., *Assistant Professor of Public Health in Residence.*
- Gary M. Fisher, Ph.D., *Assistant Professor of Public Health in Residence.*
- Isabelle F. Hunt, Dr.P.H., *Assistant Professor of Public Health in Residence.*
- Robert D. McCracken, Ph.D., *Assistant Professor of Public Health and Assistant Professor of Anthropology.*
- Miriam Morris, Ph.D., *Assistant Professor of Public Health in Residence.*
- Alfred K. Neumann, M.D., M.P.H., *Assistant Professor of Public Health in Residence.*
- William Shonick, Ph.D., *Assistant Professor of Public Health.*
- ◇
- Lilla Aftergood, Ph.D., *Assistant Research Biochemist.*
- Chauncey A. Alexander, M.S.W., *Lecturer in Public Health and Lecturer in Social Welfare.*
- Charles I. Barron, M.D., *Associate Clinical Professor of Public Health.*
- Arnold R. Beisser, M.D., *Lecturer in Public Health.*
- Barbara L. Blackwell, Dr.P.H., M.S., *Assistant Researcher in Public Health.*
- Harold N. Broderson, M.D., M.P.H., *Lecturer in Public Health.*
- Samuel Brooks, Ph.D., *Lecturer in Public Health and Associate Researcher in Engineering.*
- Harold V. Brown, B.A., M.P.H., *Associate in Public Health.*
- Fred A. Bryan, M.D., *Lecturer in Public Health.*
- Vern L. Bullough, Ph.D., M.D., *Lecturer in Public Health.*
- Richard Call, M.D., *Associate Clinical Professor of Public Health.*
- Edith M. Carlisle, Ph.D., *Assistant Researcher in Nutrition.*
- Wen-Pin Chang, M.D., D.M.Sc., M.P.H., *Lecturer in International Health.*
- Flavio Ciferri, M.D., M.P.H., *Lecturer in Public Health.*
- Alvin Davis, M.D., *Assistant Clinical Professor of Public Health.*
- Kenneth M. Eastman, B.S., *Associate Clinical Professor of Public Health.*
- Wadie M. Elaimy, Dr.P.H., *Lecturer in Public Health.*
- Jean S. Felton, M.D., *Lecturer in Public Health.*
- Barton Lee Fischer, M.D., *Lecturer in Public Health.*
- Seymour Fisher, M.D., *Associate Clinical Professor of Medical Care.*
- John T. Fodor, Ed.D., *Lecturer in Public Health.*
- Toby Freedman, M.D., *Associate Clinical Professor of Public Health and Associate Clinical Professor of Preventive Medicine and Public Health.*
- James E. Gardner, Ph.D., *Lecturer in Public Health and Lecturer in Psychology.*
- Alan J. Gross, Ph.D., *Research Statistician.*
- Gerald A. Heidbreder, M.D., M.P.H., *Lecturer in Public Health.*
- Herbert L. Herschensohn, M.D., *Lecturer in Public Health, Associate Clinical Professor of Preventive Medicine and Public Health and Associate Clinical Professor of Medicine.*
- Robert W. Hetherington, Ph.D., *Lecturer in Medical Care Organization and Assistant Research Sociologist.*

- James C. Hitchcock, Jr., Sc.D., *Assistant Research Entomologist.*  
 Marvin Hoffenberg, Ph.D., *Lecturer in Public Health and Lecturer in Political Science.*  
 Arthur C. Hollister, M.D., M.P.H., *Lecturer in Public Health.*  
 Olive G. Johnson, B.A., *Lecturer and Associate Researcher in Public Health.*  
 Charles Keeran, M.S.W., *Lecturer in Public Health.*  
 Addie Lou Klotz, M.D., M.P.H., *Lecturer in Public Health.*  
 Benjamin A. Kogan, M.D., Dr. P.H., *Lecturer in Public Health.*  
 Joel W. Kovner, Dr.P.H., *Lecturer in Medical Care Organization.*  
 Irving Krasnow, Ph.D., *Lecturer in Public Health.*  
 Howard Laitin, Ph.D., *Associate Clinical Professor of Medical Care Organization.*  
 Carl A. Lawrence, Ph.D., M.S., *Lecturer in Public Health.*  
 Ronald A. Le Clair, Dr.P.H., M.S., *Assistant Researcher in Public Health.*  
 Hallett A. Lewis, M.D., D.Sc., *Assistant Clinical Professor of Public Health.*  
 David Littauer, M.D., *Associate Clinical Professor of Medical Care Organization.*  
 Jerome W. Lubin, B.S., M.C.P., *Lecturer in Public Health.*  
 Allen W. Mathies, Ph.D., M.D., *Lecturer in Infectious and Tropical Diseases.*  
 Harold Mazur, M.D., M.P.H., *Lecturer in Public Health and Lecturer in Preventive Medicine.*  
 Florence C. McGucken, M.S., *Lecturer in Nutrition.*  
 Claire R. McWilliams, R.N., M.P.H., *Lecturer in Health Education.*  
 Malcolm H. Merrill, M.D., M.S., M.P.H., *Lecturer in Public Health.*  
 Jean L. Mickey, Ph.D., *Lecturer in Public Health.*  
 Seward E. Miller, M.D., *Lecturer in Public Health and Lecturer in Preventive Medicine and Public Health.*  
 Howard W. Mitchell, M.D., M.P.H., *Lecturer in Public Health.*  
 A. Taher Moustafa, M.D., Dr.P.H., *Lecturer in Medical Care Organization.*  
 Donald F. Muhich, M.D., *Lecturer in Public Health.*  
 David M. Myers, B.A., M.P.A., *Lecturer in Medical Care Organization.*  
 David Odell, A.B., M.H.A., *Lecturer in Hospital Administration.*  
 Harriet B. Randall, M.D., *Lecturer in Public Health.*  
 Shirley W. Rich, B.A., M.P.H., *Associate in Public Health.*  
 Robert S. Rocke, M.D., M.P.H., *Lecturer in Public Health.*  
 Jack C. Rogers, B.S., *Lecturer in Public Health.*  
 Edward L. Russell, M.D., M.A., *Lecturer in Public Health.*  
 Ernest M. Sable, A.B., M.P.H., *Lecturer in Hospital Administration.*  
 Helen L. Salmon, R.N., B.S., *Lecturer in Occupational Health and Clinical Instructor in Public Health Nursing.*  
 David Sanders, M.D., M.P.H., *Lecturer in Public Health and Assistant Clinical Professor of Psychiatry.*  
 Arthur N. Schwartz, Ph.D., *Lecturer in Public Health.*  
 Marian G. Selvin, B.S., M.P.H., *Associate in Public Health.*  
 Charles L. Senn, M.S., *Lecturer in Public Health.*  
 Laurens Silver, *Lecturer in Law and Lecturer in Public Health.*  
 Robert L. Smith, M.D., M.P.H., *Associate Clinical Professor of Public Health.*  
 Leo Tepper, M.D., M.P.H., *Lecturer in Public Health.*  
 Robert E. Thomas, M.D., *Lecturer in Community Mental Health.*  
 Packard Thurber, Jr., M.D., *Lecturer in Public Health and Associate Clinical Professor of Preventive Medicine and Public Health.*  
 J. Albert Torribio, M.S.S.W., M.S.W., *Lecturer in Health Education.*  
 Marsden Wagner, M.D., M.S.P.H., *Lecturer in Public Health.*  
 J. Arthur Waites, Ph.D., *Lecturer in Mental Health.*  
 Rosabelle P. Walkley, B.A., *Lecturer in Behavioral Sciences and Associate Research Behavioral Scientist.*

Lawrence Wayne, Ph.D., *Lecturer in Public Health.*

Paul F. Wehrle, M.D., *Lecturer in Epidemiology.*

Robert C. Weiss, M.D., M.P.H., *Lecturer in Maternal and Child Health.*

Paul Zukin, M.D., M.P.H., *Lecturer in Public Health.*

#### Lower Division Course

#### 44. Principles of Healthful Living.

Fundamentals of healthful living; designed to provide scientific health information and promote desirable attitudes and practices. The Staff

#### Upper Division Courses

#### 100. Introduction to Principles of Public Health.

Prerequisite: twelve units of biology, zoology, and bacteriology, or consent of the instructor. The identification and discussion of the philosophy, concepts and principles of public health and the relationship of these to the ecological framework of community organization to meet health service needs. Mr. Moustafa

#### 101. Introduction to Medical Science.

Prerequisite: one year sequence in biology, zoology or physiology; or consent of the instructor. This course will present an introduction to disease processes. It is intended primarily for students in public health and is not open to premedical students. Mr. Goldman

#### 102A-102B. Health Record Science.

Lecture, three hours; laboratory, three hours. Prerequisite: enrollment as a major in public health. Nosology. Principles and theories of systems and techniques used for organization, analysis, and maintenance of records and reports are studied and evaluated according to their use in varied situations. Miss Johnson

#### \*105. Medical Care in Modern Society. (½ course)

Prerequisite: upper division standing or consent of the instructor. An analysis of the functions of our personal health service systems and the assumptions which underlie and dominate traditional patterns of medical care organization. Mr. Du Bois

#### 106. Health and Consumer Economics.

Prerequisite: Economics 1, 2, or 100. A study of the impact of health problems and costs on individual and family incomes and expenditures, including productivity and dependency. Mr. Rada

#### 106. Food Analysis.

(Formerly numbered Nutritional Science 101.) Lecture, three hours; laboratory, six hours. Prerequisite: Chemistry 1A, 1B, 1C. The application of quantitative methods to the chemical and microbiological assay of foods. Mrs. Alfin-Slater

#### 109. History of Public Health and Social Medicine.

(½ course)

Prerequisite: consent of the instructor. A world history of the ideas, attitudes and institutions of public health and social medicine, with some considerations of changing social, economic and cultural relationships. The Staff

#### 110. Environmental Health. (½ course)

Prerequisite: Bacteriology 100A-100B-100C, or Biology 1A and Chemistry 1A. The fundamental objectives, goals and methods of environmental health, including the relationships of physical, biological and social factors of health. Mr. Senn

#### 111. Principles of Food and Nutrition. (½ course)

(Formerly numbered Nutritional Science 111.) Lecture, two hours. A survey of the principles of nutrition and their application in normal conditions of growth and development. Food habits in relation to nutritive requirements and health. Mrs. McCucken

#### 112. Public Health Engineering.

Prerequisite: course 110, and consent of the instructor. Planning, design, and survey of factors related to the physical aspects of environmental health with particular reference to water, wastes, pollution control, drainage and building design and equipment and environmental health planning. Mr. Senn

#### 113. Nutrition.

(Formerly numbered Nutritional Science 113.) Prerequisite: organic chemistry, Biology 1A-1B. The chemistry and biochemistry of carbohydrates, fats, proteins, minerals, and vitamins in relation to human nutrition. Miss Swendseid

#### 114A-114B-114C. Biologic Processes.

(Formerly numbered Nutritional Science 114A.) Prerequisite: organic chemistry, one year; Biology 1A-1B. The metabolism of lipids, carbohydrates, and proteins; the role of hormones and enzymes in metabolism; physiologic processes occurring in various organs. Mrs. Alfin-Slater, Mr. Pogrund, Miss Swendseid

#### 114D-114E. Biologic Processes Laboratory.

(½ course each)

(Formerly numbered Nutritional Science 114B.) Laboratory, six hours. Prerequisite: organic chemistry, one year; Biology 1A-1B. Analytical procedures for the various constituents of blood and urine and other physiologic measurements. Mr. Clark, Mr. Pogrund

#### 115. Nutritional Requirements. (½ course)

(Formerly numbered Nutritional Science 115.) Prerequisite: consent of instructor. The experimental basis for the establishment of recommended dietary allowances and a critical study of the methods used to assess the nutritional adequacy of various foods and the nutritional status of individuals. Mrs. Alfin-Slater

#### 116. Therapeutic Nutrition. (½ course)

(Formerly numbered Nutritional Science 116.) Lecture, two hours; laboratory, two hours. Prerequisite: course 113 or equivalent and consent of instructor. A study of recent findings in the field of diet and disease and modifications made in the normal diet to meet these conditions. Mrs. McCucken

\* Not to be given, 1970-1971.



**117. Biotechnology of Air Pollution. (½ course)**

Prerequisite: upper division standing and consent of the instructor. Problems of air pollution are considered for significance in human ecology, nature of physical-chemical stressor agents, sources of air-borne contaminants, and modes of effluent control; economic, sociological, political, and legal factors and their integration into environmental quality design of new cities. Mr. Pogrand

**130A-130B. Health Science for Pre-Adults.**

Theories and principles of health science in schools and colleges; legal aspects, instruction, services, environment, and interrelationships with community resources. Mr. Fodor

**131. Principles of School-Child Health.**

Prerequisite: course 44 or consent of the instructor. (Not open to school health education majors.) The history, philosophy and principles of health as applied to the needs of school children. Mr. Johns

**\*134. Community Health Education.**

The theory, principles and practices of education and community organization involved in promoting motivation of individuals, groups and communities. Mr. Torribio

**142. The World's Population and Food. (½ course)**

(Formerly numbered Nutritional Science 142.) Prerequisite: consent of the instructor. The world's food sources; major food groups, human food requirements and consumption; food in developing economies; the international movement of foods; interrelations of foods, population, and economic progress. Mr. Rada

**147. Principles of Epidemiology.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 101 or equivalent in biological sciences, and 160A (may be taken concurrently). Introduction to epidemiology including study of factors governing the occurrence of diseases in populations. Laboratory problems illustrative of basic epidemiologic methods. Mr. Chapman, Mr. Discher and the Staff

**149. Behavioral Sciences and Health.**

(Formerly numbered 249A.) Prerequisite: consent of the instructor. Relationship of basic concepts in the behavioral sciences pertinent to health and medical care; cultural and social class variations in health status; health team and community relations; community decision making in public health. The Staff

**\*153. Public Health Microbiology.**

Lecture, two hours; laboratory, six hours. Prerequisite: Bacteriology 100A, Chemistry 1A, 1B, 1C, 4A, 4B, 4C, 6A, 6B, 6C, Biology 1A, 1B, or equivalents. Basic principles and laboratory procedures employed in the provision of sanitary elements to the community, including food and milk, water supply and waste disposal, soil, and environmental effluents. The Staff

**154. Economics of Health and Medical Care.**

(Formerly numbered 254.) Prerequisite: Economics 1, 2, or equivalent, or consent of the instructor. A study of demand, supply, and price determinants in the private and public sectors of the health and medical care fields. Mr. Rada

\* Not to be given every year.

**155. Financing Health Facilities and Services. (½ course)**

Prerequisite: Economics 100 or 160, or consent of the instructor. Sources and costs of funds, conditions of their use and repayment, and analyses of fund allocations to goal attainments. Mr. Rada

**160A. Introduction to Biostatistics.**

Lecture, three hours; laboratory, three hours. Prerequisite: upper division standing; courses in the biological or physical sciences. Students who have completed courses in statistics may enroll only with the consent of the instructor. Introduction to methods and concepts of statistical analysis. Sampling situations with special attention to those occurring in the biological sciences. Topics will include: distributions, tests of hypotheses, estimation, types of error, significance and confidence levels, sample size. The Staff

**160B. Introduction to Biostatistics.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 160A, or consent of the instructor. Introduction to analysis of variance, linear regression, and correlation analysis; sequential analysis in medical trials, distribution-free methods and enumeration statistics. The Staff

**160C. Introduction to Biostatistics.**

Lecture, three hours; laboratory, three hours. Prerequisite: courses 160A, 160B, or consent of the instructor. Analysis of variance, bioassay, design and analysis of experiments useful in the biological field. The Staff

**160D. Introduction to Biostatistics.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 160B or consent of the instructor. Linear and multiple regression analysis, polynomial regression, analysis of covariance, and related topics. The Staff

**161. Demography.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 160A or consent of the instructor. Sources and evaluation of demographic information. Demographic description of human populations and analysis of changes over time; interrelationships among changes in structure, migration and vital rates. Various uses of the life table in demographic analyses. Mrs. Mickey

**198. Special Courses. (½ to 1 course)**

Prerequisite: consent of the instructor. Data acquisition for health information systems. Principles of forms design; control techniques; insuring data reliability; review of modern data acquisition systems. Mr. Brooks

**199. Special Studies. (½ or 1 course)**

Prerequisite: senior standing and consent of the instructor. All fields of study. The Staff

**Graduate Courses****201A-201B. The Hospital and the Community.**

(½ course, 1 course)

Prerequisite: course 450A, Business Administration 281. Interorganizational relationships between community health care institutions and the community they serve. Alternative intraorganizational functions and relationships in the hospital. Mr. Cooney, Mr. Reeder and the Staff

**282A. Governmental Health Services and Trends.**

Prerequisite: consent of the instructor. Systematic analysis of organized programs of personal health services, preventive or therapeutic, under various governmental agencies at all jurisdictional levels. Study of trends toward integration of traditional public health with newer medical care and quality-control functions. Mr. Shonick

**282B. Problems of Medical Care Administration.**

Prerequisite: course 202A or consent of the instructor. Problems of administration of special elements of medical care, methods of quality evaluations, and legislative issues. Mr. Roemer

**283. Maternal and Child Health.**

(Formerly numbered 203A.) Study of the important health problems of children and of women of childbearing age and the programs developed to meet these problems. Studies include maternal health, out-of-wedlock and teenage pregnancy, perinatal mortality, child health supervision, school health services, handicapped children, etc. Mr. Mitchell

**\*206. Medical Care Systems in International Perspective. (½ course)**

Prerequisite: consent of the instructor. Analysis of systems of medical care organization in countries of different stages of economic development and diverse political settings. Comparative approaches to ambulatory, institutional, and preventive services in the private, insurance, and governmental sectors. Mr. Roemer

**286. Law, Social Change and Health Service Policy.**

Prerequisite: course 200A and consent of the instructor. Critical legal issues affecting policy formulation for environmental, preventive and curative health service programs in light of changing social conditions. Emphasis will be given to political power, constitutional change, legislative policy and specific critical issues in health services, such as professional licensure and prepaid medical care. Mr. Silver

**210. Advanced Environmental Health.**

Prerequisite: course 110, or equivalent. Theoretical considerations and supporting data requisite for scientific establishment and justification of environmental health standards and requirements, with particular reference to related health factors. Mr. Senn

**211A-211D. Advanced Nutrition. (½ course each)**

(Formerly numbered Nutritional Science 211A-211B-211C.) Prerequisite: Biological Chemistry 101A-101B-101C or equivalent and consent of the instructor. Biochemical aspects of nutrition; metabolic and nutrient interrelationships. The Staff

**212A-212D. Laboratory Techniques in Environmental and Nutritional Sciences.**

(½ course each)

(Formerly numbered Nutritional Science 212A-212B.) Laboratory, six hours. Prerequisite: consent of instructor. Instrumentation and methodology including animal techniques. The Staff

**215. Infectious Diseases in Temperate Regions.**

Prerequisite: course 147 or 246A, or consent of the instructor. Practice of public health related to communicable diseases in the region. Mr. Mathies

**216A. Infectious Diseases in Tropical Regions.**

Prerequisites: course 147 or 246A and Bacteriology 100A-100B or Medical Microbiology and Immunology 201A. Introduction to the literature on infectious diseases. Systematics, zoogeography, ecology, life zones, human behavior and disease, and the phenomena of infection and immunity in relation to causation and distribution of tropical diseases. Mr. Work and the Staff

**216B. Infectious Diseases in Tropical Regions.**

(Formerly numbered 216A.) Lecture, two hours; laboratory, six hours. Prerequisite: course 216A or consent of the instructor. Lectures, demonstrations and laboratory exercises dealing with the natural history, epidemiology, diagnosis and prevention of viral, rickettsial, bacterial and fungal diseases encountered in tropical regions. Mr. Work and the Staff

**216C. Infectious Diseases in Tropical Regions.**

(Formerly numbered 216B.) Lecture, two hours; laboratory, six hours. Prerequisite: courses 216A-216B. Lectures, demonstrations and laboratory exercises dealing with the natural history, epidemiology, diagnosis and prevention of protozoal and metazoal parasitic diseases encountered in tropical regions. Mr. Work and the Staff

**217. Public Health Microbiology.**

Lecture, two hours; laboratory, six hours. Prerequisite: Bacteriology 100A or equivalent. Advanced principles and laboratory procedures employed in solution of public health problems in control of infectious diseases with special emphasis on food, milk, water, waste disposal and contamination of soil, water and atmosphere. The Staff

**219. Arthropods of Medical Importance.**

Lecture, two hours; laboratory, six hours. Prerequisite: consent of the instructor. The biology and identification of mites and insects of public health importance involved in the transmission and causation of human diseases. Mr. Barr and the Staff

**222A-222B. Physical and Chemical Environmental Stresses.**

Prerequisite: course 229 and consent of the instructor. The mechanisms by which the many environmental stresses cause disease and disability, with particular emphasis upon the various types of toxic materials found in work establishments and the surrounding communities. Mr. Pogrand

**224A-224B. Environmental Toxicology. (½ course each)**

Prerequisite: courses 474A-474B and consent of the instructor. A discussion of the many toxic chemicals encountered in man's various work environments with emphasis upon the specific action of toxic chemicals upon cells, selective affinity of toxic materials for tissues, the toxic manifestations in man, diagnosis and treatment of environmental intoxications. The Staff

**228A-228B. Occupational Diseases. (½ course each)**

Prerequisite: courses 474-474B, and consent of the instructor. A detailed consideration of the etiology, pathology, clinical manifestations, diagnosis and treatment of selected occupational diseases with emphasis upon prevention. Mr. Discher

\* Not to be given, 1970-1971.

**229. Control of Health Hazards in the Work Environment. (½ course)**

Prerequisite: consent of the instructor. A consideration of the philosophy and theory of the control of occupationally incurred illnesses and injuries.

The Staff

**230. School Health Program Development and Evaluation.**

Prerequisite: courses 130A-130B, 250. Program components, process, implementation, and evaluation.

Mr. Johns

**231. Advanced Public Health Microbiology.**

Lecture, two hours; laboratory, six hours. Prerequisite: consent of the instructor. Advanced studies in mycobacteria, venereal diseases and enteric diseases including cholera.

The Staff

**233. Change Determinants in Health-Related Behavior.**

Prerequisite: minimum of four courses of behavioral science (one of which must be upper division), concurrent enrollment in course 149, or consent of the instructor. A unified behavioral science approach to the natural determinants of change in health-related behavior at the community, group and individual levels, as a foundation for planned change.

The Staff

**234. Advanced Community Health Education.**

Prerequisite: consent of the instructor. Problems of social, economic, and cultural origin as they apply to sound community organization in the public health field. Examination of the health education activities of professional, voluntary, and official health agencies and analysis of their interrelationships.

The Staff

**235. Health Education in Clinical Settings.**

Prerequisite: consent of the instructor. Analysis of the role, methods, and techniques of health education pertaining to hospitals, clinics, and patient education. Observation and discussion of clinical activities in the medical center in relation to the process of health education.

The Staff

**236. Assessment in Planned Behavior Change.**

Prerequisites: courses 160A, 245A, 234 and/or consent of the instructor. Analysis of the theoretical foundations of evaluation, with special reference to the design and implementation of the evaluation component in planned behavior change.

Mr. Cochran

**237. Mental Health Services as Social Systems.**

Social system theory as applied to the problems encountered in the development, operation and administration of mental health services.

Mr. Waites

**238. Ecology of Mental Health.**

Prerequisite: consent of the instructor. The effects of physical, social, political and economic environment on the mental health of the members of a society.

Mr. Fisher

**239A. Statistical Methods in Clinical Trials and Medical Surveys. (½ course)**

Prerequisite: courses 160A, 160B, graduate standing in public health or related field. Design of experiments and statistical analysis appropriate to clinical trials and medical surveys.

Mrs. Clark

**239B. Statistical Methods in Clinical Trials and Medical Surveys. (½ course)**

Prerequisite: Mathematics 12A, 12B, 152A, 152B, and equivalent of six units of statistical methods; course 239A is recommended but not required. Review and development of statistical methodology applicable to clinical trials and medical surveys.

Mrs. Clark

**240A-240B-240C. Biostatistics.**

Prerequisite: courses 160A, 160B, 160C; Mathematics 152A-152B, 12A or the equivalent. With the consent of the instructor, certain of the prerequisites may be taken concurrently. Quantitative methods in public health, medicine, and the biological sciences, statistical theory and application to problems in the design and analysis of experiments and surveys.

Mrs. Clark, Mr. Dixon

**241A-241B. Linear Statistical Models.**

Prerequisite: Mathematics 152A-152B, courses 160A, 160B, 160C or equivalent. Topics in algebra and statistics pertinent to the application of linear statistical models, especially in the life and medical sciences. These include matrix algebra, quadratic forms, the Gauss-Markov theorem, types of linear models (fixed and random components).

Mr. Aftis, Mrs. Dunn

**242A-242B-242C. Multivariate Biostatistics.**

Prerequisite: course 241A or equivalent. Multivariate analysis as it is used in biological and medical situations. Topics from component analysis, factor analysis, discriminant analysis, analysis of dispersion, canonical analysis.

Mr. Aftis, Mrs. Dunn

**243A. Advanced Topics: Stochastic Processes.**

(½ course)

Prerequisite: courses in upper division mathematics including statistics and probability. Stochastic processes applicable to medical and biological research.

Mrs. Dunn, Mr. Massey

**243B. Advanced Topics: Mathematical Epidemiology.**

(½ course)

Prerequisite: course 243A or equivalent and courses in upper division mathematics including statistics and probability. Mathematical theory of epidemiology with deterministic and stochastic models, and problems involved in applying the theory.

Mr. Massey

**243C. Advanced Topics: Statistical Genetics.**

(½ course)

Prerequisite: courses in upper division mathematics including statistics and probability. Introduction to statistical genetics.

Mrs. Dunn, Mr. Massey

**245A. Research Methods in Community Health.**

(Same as Anthropology 292.) Prerequisite: course 160A, and 147 or 246A, or consent of the instructor. Preparation for planning and conducting research projects; methods and techniques of community health research; basic skills in research methodology.

Mr. Reeder

**245B. Advanced Research Methods in Community Health. (½ course)**

Prerequisite: course 245A or consent of the instructor. An advanced seminar for doctoral degree candidates preparing for a research career. Focus upon defining problems for research, analyzing re-

research designs, and constructing research designs using a variety of research methods in community health studies, including discussion of student's own research plans. Mr. Reeder, Mrs. Morris

**245C-245D. Evaluative Research in Health and Mental Health Settings. (1 course, ½ course)**

Prerequisite: courses 160A, 245A, 245B or equivalent. Principles, philosophy, and behavioral sciences methodology appropriate in testing outcomes of ongoing and demonstration programs aimed at reducing morbidity and mortality; disease detection programs; rehabilitation programs in health and mental health fields. Case presentations.

Mr. Wilner and the Staff

**246A-246B. Advanced Epidemiology.**

Lecture, three hours; laboratory, three hours. Prerequisites: courses 147, 160A, and consent of the instructor. Advanced study of epidemiology of acute and chronic diseases including epidemiologic research methods. Mr. Chapman, Mr. Discher

**247A-247B. Epidemiology of Cancer. (½ course each)**

Prerequisite: courses 147, 160A, or consent of the instructor. Epidemiologic methods and principles in the study of cancer. Host and environmental factors associated with cancer; interrelationships and biological relevance. Mrs. Stern

**248. Epidemiologic Studies in Human Populations. (½ course)**

Prerequisites: course 147, 160A and consent of the instructor. Problems in epidemiology with attention to current research on diseases of public health importance. Mr. Chapman, Mr. Discher and the Staff

**249A. Sociocultural Aspects of Health and Illness.**

(Same as Sociology 249A.) Prerequisite: course 149 or graduate standing in sociology, anthropology or psychology and consent of the instructor. Sociocultural aspects of health and disease, health behavior and health organizations. Mr. Reeder and the Staff

**249B. Sociocultural Aspects of Health and Illness.**

(Same as Sociology 249B.) Prerequisite: course 149A or consent of the instructor. Theoretical and conceptual approaches in the behavioral sciences contributing to an understanding of various health conditions and health behavior. Mr. Reeder and the Staff

**250. Current Problems in School Health Education Seminar.**

Prerequisite: courses 130A-130B or consent of the instructor. A study of new findings in the health education content areas (such as nutrition, mental health, family health, consumer health, safety, communicable and chronic diseases). Mr. Johns

**251. Administrative Relationships in School Health Seminar.**

Prerequisite: courses 230 and 250 or consent of the instructor. Responsibility and authority for school health in educational institutions and relationships with other agencies and groups. Mr. Johns

**252A-252B. Seminar in Community Mental Health. (½ course each)**

Prerequisite: consent of the instructor. Study of

community problems in mental disease, retardation, deviations and delinquency, and the social agencies that have been developed to meet them. Covers also such areas as marriage counseling, divorce, psychological problems of aging, and forensic psychiatry. Emphasis is placed on the role of research in public health psychiatry. Mr. Wilner and the Staff

**255. Current Problems with Arthropod-borne Viruses.**

Lecture, two hours; laboratory, six hours. Prerequisite: courses 216B, 418; Medical Microbiology and Immunology 201A, 201B or equivalent, consent of the instructor. For the specialist or advanced student presentation of specific aspects in the etiology, epidemiology, epizootiology, ecology, pathogenesis, clinical manifestations, diagnosis, and control of arthropod-borne virus diseases through lectures and laboratory exercises. Mr. Work and the Staff

**259. Public Health Aspects of Mental Retardation. (½ course)**

(Formerly numbered 290G.) Prerequisite: consent of the instructor. Biological, cultural, and sociopsychological aspects of mental retardation, which in numbers affected, consequences, and possibilities of remedial action constitutes a major problem in public health. Mr. Katz

**260. Public Health Aspects of Rehabilitation of the Disabled. (½ course)**

The course will focus on the research background for rehabilitation activities in the health-caring professions, and on those current rehabilitation programs and issues of greatest concern to public health. Mr. Katz

**261A-261B. Seminar in Community Health Education. (½ course)**

Prerequisite: consent of the instructor. The Staff

**262. Current Problems with Mosquito Vectors.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 219; Zoology 121, 122; Bacteriology 100C, or consent of the instructor. Current topics of significance on mosquito biology as related to colonization, disease transmission and control. Mr. Barr and the Staff

**263. Seminar in Maternal and Child Health. (½ course)**

(Formerly numbered 203B.) Study of selected health problems of children and of women of child-bearing age and programs developed to meet these problems. Recent advances in medical science relevant to maternal and child health, new ideas in the administration of maternal and child health programs, and international trends in maternal and child health programs. Mr. Mitchell

**264. Current Problems with Metazoal Parasites. (1½ courses)**

Lecture, six hours; laboratory, eighteen hours. Prerequisite: consent of the instructor. Advanced study of morphology, systematics, epidemiology, host-parasite relationships, and control of helminths with emphasis on biological aspects of zoonotic parasites. Mr. Schacher

**265A-265B. Seminar in Epidemiology.**

(½ course each)

Prerequisite: course 147 or 246A, or consent of the instructor. Student presentations of pertinent material examining the methods and principles of epidemiology as applied to specific diseases.

Mr. Chapman, Mr. Discher and the Staff

**266A-266D. Seminar in Infectious and Tropical Diseases. (½ course each)**

Current topics relating to public health microbiology and infectious and tropical diseases. Topics vary from year to year. Each one-half course may be repeated once for credit with consent of the instructor.

Mr. Schacher, Mr. Work and the Staff

**269A-269B-269C. Seminar in Biostatistics.**

(½ course each)

Prerequisite: consent of the instructor. The Staff

**270. Basic Processes and Medical Aspects of Aging. (½ course)**

Prerequisite: course 271A or consent of the instructor. Review of basic physiological, medical, and psychiatric aspects of human aging; review of factors in rehabilitation and reeducation of persons in middle and later years.

Mr. Goldman, Mr. Rocke

**271A-271B. Behavioral Science Aspects of Human Aging.**

(Formerly numbered 271A.) Prerequisite: three quarter courses or the equivalent of advanced study in anthropology, psychology or sociology; course 149 (may be concurrent); or consent of the instructor. Behavioral science aspects of the middle and later years, with emphasis upon sociocultural influences and individual differences.

Mr. Kalish, Mr. Wilner

**272. Community Programs and Services for the Elderly. (½ course)**

(Formerly numbered 271B.) Prerequisite: course 271A or consent of the instructor. An analysis of governmental, voluntary and proprietary programs for persons in middle and later life. Emphasis on principles of priority planning, effectiveness and evaluation of programs for the elderly.

Mr. Kalish, Mr. Wilner

**275A-275B-275C. Seminar in Environmental Physiology.**

Prerequisite: consent of the instructor. Expansion of selected topics in environmental physiology, such as aerospace and undersea environment, natural resource contamination, pesticides, medical geophysics, biometeorology, noise, and application of systems analysis to urban-land management. Student presentation of published papers or own research progress.

Mr. Pogrand

**277A-277B. Seminar in the Physiology of Work.**

Lecture, two hours; laboratory, two hours. Prerequisite: consent of the instructor. The quantification of human capacity to tolerate work under a variety of occupational situations; the establishment of criteria for the prediction of work capacity as a function of age, medical history, sensory load, physical environment, rehabilitative training, and task nature.

Mr. Pogrand

**279. Seminar: Advanced Studies in Gerontology. (½ course)**

(Formerly numbered 270B.) Prerequisite: course 271A-271B. A critical analysis of special problems in aging. May be repeated for credit.

Mr. Kalish, Mr. Wilner

**280A-280B. Seminar in Environmental Health. (½ course each)**

Prerequisite: consent of the instructor. The Staff

**281A-281B. Policy Issues in Governmental Health Programs Seminar. (½ course each)**

Prerequisite: course 200A, and consent of the instructor. Credit and grade to be given only upon completion of 281B. Policy issues affecting governmental health programs in the metropolitan-urban environment. Key legal, political, administrative, and social questions affecting the formulation and implementation of governmental health policy.

Mr. Lubin

**282A-282B. Community Mental Health. (1 course, ½ course)**

Prerequisite: three upper division quarter courses in psychology, sociology, anthropology or the equivalent. Research methods background desirable. Principles of community mental health programs. Study of socioenvironmental setting in which mental illness occurs, is detected and is treated. Discussion of prevention of mental illness, program effectiveness, and mental health components of public health programs.

Mr. Sanders, Mr. Wilner

**283. Seminar in Behavioral Sciences and Health. (½ course)**

Prerequisite: courses 249A-249B or consent of the instructor. Recent significant contributions of the behavioral sciences to the understanding of health and illness, with selected and varying topics each quarter. May be repeated for credit.

Mr. Reeder, Mr. Wilner and the Staff

**284. Seminar in Nutrition. (½ course)**

(Formerly numbered Nutritional Science 251.) Prerequisite: consent of instructor. Recent advances in the science of nutrition and in the dietetic treatment of diseases. May be repeated for credit.

Mrs. Alfin-Slater, Miss Swendzell

**285. Seminar in Public Health Nutrition. (½ course)**

(Formerly numbered Nutritional Science 252.) Prerequisite: consent of instructor. Nutrition in the maintenance of health and treatment of disease. Nutrition survey methods. May be repeated for credit.

Mrs. Emerson

**286. Nutritional Problems in Developing Areas. (½ course)**

(Formerly numbered Nutritional Science 256.) Prerequisite: consent of instructor. Manifestations and dietary treatment of nutritional deficiencies.

Mrs. Emerson

**289. Special Group Studies. (½ or 1 course)**

Prerequisite: consent of the instructor. The Staff

290A. Community and Institutions.

290B. Environmental Health.

290C. Epidemiology of Specific Diseases.

290D. Hospital Administration.

290E. International Health.

290F. Maternal and Child Health.

- 290G. Medical Care Organization.  
 290H. Occupational Health.  
 290J. Community Mental Health.  
 290K. Community Health Education.  
 290L. Public Health Nutrition.  
 290M. Biostatistics.  
 290N. School Health Education.  
 290P. Gerontology.  
 290Q. Infectious and Tropical Diseases.  
 290R. Public Health Administration.  
 290S. Health Economics.

#### 400. Field Studies in Public Health. (½ or 1 course)

Field observations and studies in selected community organizations for health promotion or medical care. The Staff

#### 401A-401B-401C. Contemporary Issues in Hospital Management. (½ course each)

Prerequisite: consent of instructor. Selected issues affecting the future role of hospital management such as hospital effectiveness and efficiency, costs, and management-labor relations.

Mr. Cooney and the Staff

#### 402A-402B. Health Records: Planning, Analysis and Research.

Lecture, three hours; laboratory, three hours. Prerequisite: consent of the instructor. Health and administrative research, using clinical records. Principles of planning for routine and special studies. Individual investigation in methods of obtaining and processing data to meet needs of programs in institution and agency. Introduction to principles of medical auditing; analysis of medical and health services.

Miss Johnson

#### 404. Planning Resources for Personal Health Service. (½ course)

Prerequisite: consent of the instructor. Examination of methods and experiences of planning health facilities and manpower for geographic areas, including determination of social needs and adjustment of resource allocations to them. Hospital and nursing home planning; newer approaches to planning and use of health manpower. Mr. Shonick

#### \*406. Principles of Mental Hospital Administration.

(Formerly numbered 201C-201D.) Lecture and discussion, four hours; field visits, three hours. Prerequisite: consent of the instructor. Study of the principles involved in planning, organizing, and administering mental health institutions, including inpatient, outpatient and preventive programs in this field. Mr. Cooney

#### 410. Organization of Ambulatory Health Services. (½ course)

Prerequisite: consent of the instructor. An analysis of organizations providing health services to ambulatory patients, with special attention to group medical practice and to the problems of development of new patterns of ambulatory patient care in disadvantaged urban areas. Miss Klotz

#### 411. Clinical Studies in Occupational Medicine.

Prerequisite: limited to residents in the second year of the Occupational Medicine Residency Program.

\* Not to be given, 1970-1971.

gram. Clinical experience in medical residence in the areas of Pulmonary Disease, Dermatology, Physical Medicine and Rehabilitation and Occupational Medicine. The Staff

#### 418. Functions of the Public Health Laboratory. (½ course)

Lecture, one hour; laboratory, three hours. Prerequisite: consent of the instructor. The organization and administration of services of the public health laboratory will be studied. A lecture and a laboratory session once a week in basic principles and laboratory methods precede participation in procedures at Bureau of Public Health Laboratories, County of Los Angeles Health Department. The Staff

#### 420. Population, Ecology, and Health.

Prerequisite: background in biology and behavioral sciences and/or experience in family planning field programs or consent of the instructor. The broad effects of population growth on man's biologic, physical, and sociocultural environment, resulting pressures on food and natural resources, and social and health approaches for control of excessive fertility in population growth. Mr. Mitchell

#### 421. Population and Family Planning Program.

Prerequisite: course 420. The salient components of population and family planning programs in various locations and of various types, with special attention to the National Planning Program of India and the county-wide family planning program in Los Angeles. Mr. Mitchell

#### 430A. Practicum in Health Education: Analysis of Community Structure. (½ course)

Prerequisite: concurrent enrollment in course 149 and course 233 or consent of the instructor. Study of various aspects of demography, social structure and culture of client communities and groups, and analysis of these data with special reference to their implications for health education. Mr. Fisher

#### 430B. Practicum in Health Education: Determination of Community-felt Needs. (½ course)

Prerequisite: courses 234 and 430A or consent of the instructor. Application of survey and ethnographic methods for appraisal of health-related needs felt by client communities and groups; analysis of data as foundation for program design. Mr. Fisher

#### 430C. Practicum in Health Education: Program Design and Evaluation.

Prerequisite: course 430B or consent of the instructor. Planning and design of health education programs based on prior data analysis; development of evaluation procedures; integration of the respective roles of agencies and groups in the client communities. Mr. Cochran, Mr. Waites

#### 430D. Practicum in Health Education: Selection and Pretesting of Methods.

Prerequisite: courses 430C and 235 or consent of the instructor. Preliminary selection of health education methods based upon prior data analysis and relevant to selected behavioral change objectives; pretesting of methods with contrasting subcultural groups in the client communities; beginning of total program implementation. Mr. Cochran, Mr. Waites

**430E. Practicum in Health Education: Program Implementation.**

Prerequisite: course 430D or consent of the instructor. Implementation of total health education program with special reference to the respective roles of the contrasting client communities in relation to professional services; application of evaluation procedures and development of recommended program changes. Mr. Cochran

**434. Change States in the Normative Individual: Intervention for Mental Health.**

Prerequisite: consent of the instructor. Analysis of the psychological, social, and cultural factors affecting change states in the normative individual and their implications for the design and implementation of community preventive mental health education. Mr. Fisher

**435. Mass Communications in Behavioral Change Processes.**

Prerequisites: courses 235, 236 or consent of the instructor. Research, principles, and practices in health communication with special reference to the design and implementation of media and their role and effects in planned behavior change. Mr. Cochran

**444A-444B. Health Record Systems.**

(Formerly numbered 244A-244B.) Prerequisite: graduate standing and experience in health record administration. Advanced study of principles and criteria involved in planning, installing and administering systems to record, process, and retrieve data for records and reports in health and medical institutions and agencies. Miss Johnson

**450A. Health Services Organization.**

Prerequisite: consent of the instructor. Organized social efforts to mobilize resources and provision of medical care. Analysis of the complexities of the pluralistic American health service system. Mr. Roemer

**450B. Social Foundations of Public Health. (½ course)**

Prerequisite: course 450A. Health and human behavior; health as a social value; disease and society; determinants of change and innovations in health behavior; health education and health behavior. Mr. McCracken and the Staff

**450C. Environmental Health Sciences. (½ course)**

Survey of factors relating to ecological and administrative aspects of environmental health with reference to comprehensive environmental health planning. The Staff

**451. Principles of Administration for Health.**

Prerequisite: course 450A. Exploration of basic principles of administration, with emphasis on their application to health service organizations. Integrated studies in organization theory and the changing nature of management, decision process, planning and budgeting, personnel administration, control and evaluation. Mr. DuBois

**453A. Health Insurance Principles and Programs. (½ course)**

Prerequisite: course 202A and consent of the instructor. Social and actuarial principles of health insurance, with analysis of the diversity of voluntary medical care insurance plans under different spon-

sorships and with varied scopes of coverage and benefits. Relationships to public and private medical care developments. Mr. DuBois

**453B. Evaluative Research on Personal Health Services.**

Prerequisite: consent of the instructor. Analysis of methods and findings of new research on evaluation of personal health service programs in varying social contexts. Emphasis on measurement of outcomes of health service systems. Mr. Hopkins

**456A. International Health Agencies and Programs. (½ course)**

(Formerly numbered 256A.) Prerequisite: consent of the instructor. Historical development and functions of international organizations concerned with health, including United Nations units (WHO, UNICEF, etc.) as well as bilateral movements (U.S.-AID, Colombo Plan), medico-religious missions, private foundations, and other channels for dissemination of ideas and practices. Mr. Neumann

**456B. Comparative Analysis of Health Services and Disease Patterns.**

(Formerly numbered 256B.) Prerequisite: consent of the instructor. Examination of selected countries, both developing and industrialized; comparative analyses of the nature of disease problems and the diverse patterns of health service organization in various cultural and political settings. Mr. Neumann, Mr. Roemer

**456C. Issues in International Health Administration. (½ course)**

(Formerly numbered 256C.) Prerequisite: consent of the instructor. Study of critical issues in health service administration (planning, social security, manpower, etc.) which have emerged in all countries (industrialized or developing), and which have led to diverse organizational solutions. Mr. Neumann

**458. Seminar in Social Work in Public Health. (½ course)**

(Formerly numbered 258.) Prerequisite: consent of the instructor. Philosophy, methodology and research bases of social work in organized health service programs. Mr. Kats

**467. Principles of Instrumentation for Public Health Laboratories.**

Lecture, two hours; laboratory, six hours. Prerequisite: Chemistry 1A, 1B, 1C and 4A, 4B, 4C and consent of the instructor. To familiarize graduate students with medical, electronic, optical and biophysical research instruments currently used in public health laboratories. Lectures and discussions emphasizing principles of design and function. Laboratory work experience in application, operation and maintenance. The Staff

**468. Seminar in Health Record Systems. (½ course)**

(Formerly numbered 268.) Prerequisite: graduate standing. Advanced study of currently evolving health record systems with emphasis on issues, trends and methodology and their effect on services. Miss Johnson

**470. Health Aspects of Housing.**

Prerequisite: consent of the instructor. Health principles of housing and residential environment, and relationships of housing to comprehensive health

planning and to the environmental health aspects of total area planning. Mr. Senn

#### 471. Environmental Health Control.

Prerequisite: limited to students majoring in environmental health or consent of the instructor and course 153. Scientific basis for developing and conducting environmental health programs concerning vector and rodent control, food and milk, housing and institutions, places of employment, including applicable program planning and performance budgeting techniques. Mr. Senn

#### 474A-474B. Seminar in Occupational Health.

(½ course each)

(Formerly numbered 274A-274B.) Prerequisite: consent of the instructor. Intended primarily for industrial hygienists and physicians, a study of approximately 10 selected industries covering the materials, processes, techniques, working conditions, health problems, control measures, organization, and administration of health programs appropriate to those industries. Assignment of special problems with each industry studied. The Staff

#### 479A-479B. The Use of Quantitative Methods in Hospital Management Decision-Making.

(½ course, 1 course)

Prerequisite: courses 147, 160A, 453B, and Business Administration 403A-403B. Description of hospital data sources. Methods and tools for systematic application of quantitative analysis to hospital management. Mr Cooney and the Staff

#### 480. The Contemporary Environment of Hospital Management.

Prerequisite: course 450A. Role and functions of the hospital in the community. Not open to Hospital Administration majors or students who have credit for courses 201A and 201B. Mr. Cooney

Individual Study and Research

#### 596. Directed Individual Study or Research.

(½ to 2 courses)

(Formerly numbered 297.) A maximum of one course (four units) will count toward the required graduate course minimum for a master's degree. The Staff

#### 597. Preparation for Master's Comprehensive or Doctoral Qualifying Examination. (½ to 2 courses)

Not applicable to either the five graduate course requirement or the nine-course minimum for the master's degree. The Staff

#### 598. Master's Thesis Research. (½ to 2 courses)

A maximum of one course (four units) will count toward the minimum for a master's degree, but not toward the minimum number of graduate courses. The Staff

#### 599. Doctoral Dissertation Research. (½ to 2 courses)

The Staff

## ■ PUBLIC SERVICE

#### 100. Contemporary Public Problems Seminar.

Prerequisites: consent of the instructor; open to all majors with priority given to Public Service majors. Group discussion, reading and research on problems and issues of contemporary public relevance. Topics will be selected by instructors in cooperation with interested students. To be taught by instructors drawn from the entire university community, including the professional schools. Limited class enrollments. May be repeated once for credit.

#### 170. Internship in Public Service. (1 to 4 courses)

Prerequisites: junior standing in Public Service and consent of the Public Service Adviser. Limit: 4 courses (with further courses subject to approval of the Dean of the College of Letters and Science). The Internship provides opportunities for qualified students to obtain educational experience through assignments to governmental and community service organizations. Internships may be part-time or full-time; unit credit will be assigned accordingly. Students may stagger internships over several quarters or take up to two quarters full-time off-campus. This course will be graded on a Pass/Fail basis.

#### 180. Field Research in Public Service. (1 to 4 courses)

Prerequisites: junior standing in Public Service and consent of the Public Service Adviser. Limit: 4 courses (with further courses subject to approval of the Dean of the College of Letters and Science). This course provides an opportunity for individual students or research teams to engage in intensive information gathering, analysis and reporting on problems and issues of contemporary public relevance. Students may stagger their research over several quarters or take up to two quarters full time off campus. Field research will be graded on a Pass/Fail basis.

#### 190. Post-Internship: Research Seminar.

Prerequisites: two or more courses in the 170 or 180 series; senior standing and consent of the instructor. This seminar provides a forum for the group appraisal and analysis of public service internships and research projects. Students will relate theory and concepts in the social and behavioral sciences to actual experiences.

## ■ RADIOLOGY

(Department Office, BL-428 Center for the Health Sciences)

Leslie R. Bennett, M.D., *Professor of Radiology.*

Andrew H. Dowdy, M.D., D.Sc., *Professor of Radiology.*

Moses A. Greenfield, Ph.D., *Professor of Radiology.*

William N. Hanafee, M.D., *Professor of Radiology (Chairman of the Department).*

Joseph Jorgens, M.D., *Professor of Radiology in Residence.*



Raymond L. Libby, Ph.D., *Professor of Radiology.*  
 Norman S. MacDonald, Ph.D., *Professor of Radiology.*  
 Amos Norman, Ph.D., *Professor of Radiology.*  
 Richard E. Ottoman, M.D., *Professor of Radiology and Anatomy.*  
 Leo G. Rigler, M.D., *Professor of Radiology in Residence.*  
 Justin J. Stein, M.D., *Professor of Radiology and Director, Cancer Research Institute.*  
 George V. Taplin, M.D., *Professor of Radiology in Residence.*  
 Daniel J. Torrance, M.D., *Professor of Radiology.*  
 J. Michael Criley, M.D., *Associate Professor of Radiology and Cardiology in Residence.*  
 Donald T. Desilets, M.D., *Associate Professor of Radiology.*  
 DeLores E. Johnson, M.D., *Associate Professor of Radiology and Medicine in Residence.*  
 Edward A. Langdon, M.D., *Associate Professor of Radiology.*  
 Richard F. Riley, Ph.D., *Associate Professor of Radiology.*  
 Milo M. Webber, M.D., *Associate Professor of Radiology.*  
 W. Bruce Anderson, M.D., *Assistant Professor of Radiology in Residence.*  
 John R. Bentson, M.D., *Assistant Professor of Radiology.*  
 Carl G. Coin, M.D., *Adjunct Assistant Professor of Radiology.*  
 Julius H. Grollman, M.D., *Assistant Professor of Radiology.*  
 Michael Hayes, M.D., *Assistant Professor of Radiology in Residence.*  
 Gerald B. Iba, M.D., *Assistant Professor of Radiology in Residence.*  
 Barbara M. Kadell-Wooton, M.D., *Assistant Professor of Radiology.*  
 James W. Lecky, M.D., *Assistant Professor of Radiology.*  
 Lawrence S. Myers, Jr., Ph.D., *Assistant Professor of Radiology and Biophysics in Residence.*  
 James F. Mack, M.D., *Assistant Professor of Radiology in Residence.*  
 Norman D. Poe, M.D., *Assistant Professor of Radiology in Residence.*  
 Richard J. Steckel, M.D., *Assistant Professor of Radiology.*  
 Marvin Weiner, M.D., *Assistant Professor of Radiology.*  
 Gabriel H. Wilson, M.D., *Assistant Professor of Radiology.*  
 Robert A. Clark, M.D., *Instructor of Radiology in Residence.*  
 Vincent Fennell, M.D., *Instructor of Radiology in Residence.*  
 Robert K. Gray, M.D., *Instructor of Radiology in Residence.*  
 Edward Helmer, M.D., *Instructor of Radiology in Residence.*  
 Ross Prujan, M.D., *Instructor of Radiology in Residence.*  
 Harold Snow, D.V.M., *Adjunct Instructor in Radiology.*



Marvin Abrams, M.D., *Assistant Clinical Professor of Radiology.*  
 William E. Adolph, M.D., *Assistant Clinical Professor of Radiology.*  
 Sol R. Baker, M.D., *Associate Clinical Professor of Radiology.*  
 Edwin N. Barnum, M.D., *Clinical Instructor in Radiology.*  
 Larry P. Bilodeau, M.D., *Assistant Clinical Professor of Radiology.*  
 Harry A. Bishop, M.D., *Assistant Clinical Professor of Radiology.*  
 Louis J. Bonann, M.D., *Assistant Clinical Professor of Radiology.*  
 John D. Buckley, M.D., *Clinical Instructor in Radiology.*  
 Albert B. Cole, M.D., *Clinical Instructor in Radiology.*  
 Robert L. Cook, M.D., *Clinical Instructor in Radiology.*  
 James G. Davis, M.D., *Associate Clinical Professor of Radiology.*  
 Earl K. Dore, M.D., *Associate Clinical Professor of Radiology.*  
 Harold L. Endlich, M.D., *Assistant Clinical Professor of Radiology.*  
 Karl H. Falkenbach, M.D., *Assistant Clinical Professor of Radiology.*  
 Bernard H. Feder, M.D., *Clinical Professor of Radiology.*  
 Darwood B. Hance, M.D., *Assistant Clinical Professor of Radiology.*

Richard B. Hanchett, M.D., *Assistant Clinical Professor of Radiology.*  
 Oscar Harvey, M.D., *Assistant Clinical Professor of Radiology.*  
 Maurice M. Haskell, M.D., *Assistant Clinical Professor of Radiology.*  
 Gerald Hassan, M.D., *Assistant Clinical Professor of Radiology.*  
 Samuel B. Haveson, M.D., *Assistant Clinical Professor of Radiology.*  
 Richard B. Hoffman, M.D., *Assistant Clinical Professor of Radiology.*  
 John W. Horns, M.D., *Assistant Clinical Professor of Radiology.*  
 Margaret A. Ingram, M.D., *Clinical Instructor in Radiology.*  
 John J. Jares, M.D., *Associate Clinical Professor of Radiology.*  
 William C. Johnson, M.D., *Assistant Clinical Professor of Radiology.*  
 Arthur R. Kagan, M.D., *Assistant Clinical Professor of Radiology.*  
 Tom A. Kendig, M.D., *Associate Clinical Professor of Radiology.*  
 Roscoe L. Koontz, *Lecturer in Radiology.*  
 Milton Kunin, M.D., *Assistant Clinical Professor of Radiology.*  
 Robert A. Ledner, M.D., *Assistant Clinical Professor of Radiology.*  
 Kenneth W. Lewin, M.D., *Assistant Clinical Professor of Radiology.*  
 Joseph F. Linsman, M.D., *Associate Clinical Professor of Radiology.*  
 Paul S. Mahoney, M.D., *Assistant Clinical Professor of Radiology.*  
 James E. Massman, M.D., *Clinical Instructor of Radiology.*  
 Harry A. Morewitz, Ph.D., *Lecturer in Radiology.*  
 Jasper E. Morgan, Ph.D., *Clinical Professor of Radiology.*  
 Paul D. Mowat, M.D., *Lecturer in Radiology.*  
 Ronald J. O'Reilly, M.D., *Clinical Instructor in Radiology.*  
 Theodore T. Ott, R.T., *Lecturer in Radiology.*  
 Joseph A. Parks, M.D., *Assistant Clinical Professor of Radiology.*  
 Harry Pearlman, Ph.D., *Associate Clinical Professor of Radiology.*  
 Hyman Peck, M.D., *Assistant Clinical Professor of Radiology.*  
 William L. Pogue, M.D., *Assistant Clinical Professor of Radiology.*  
 David I. Rabinov, M.D., *Assistant Clinical Professor of Radiology.*  
 Burton I. Rein, M.D., *Assistant Clinical Professor of Radiology.*  
 Joseph C. Sanchez, *Lecturer in Radiology.*  
 Joseph E. Scallan, M.D., *Assistant Clinical Professor of Radiology.*  
 Arthur F. Schanche, M.D., *Assistant Clinical Professor of Radiology.*  
 Alfred L. Schmitz, M.D., *Associate Clinical Professor of Radiology.*  
 Daniel H. Simmons, M.D., *Professor of Medicine.*  
 Alan B. Skorneck, M.D., *Assistant Clinical Professor of Radiology.*  
 Richard L. Smith, M.D., *Clinical Professor of Radiology.*  
 Edgar L. Surprenant, M.D., *Assistant Clinical Professor of Radiology.*  
 Joseph E. Thornhill, M.D., *Assistant Clinical Professor of Radiology.*  
 Harry T. Vanley, M.D., *Clinical Instructor in Radiology.*  
 Henry S. Williams, M.D., *Assistant Clinical Professor of Radiology.*  
 Alan C. Winfield, M.D., *Clinical Instructor in Radiology.*  
 John R. Woodruff, Jr., M.D., *Associate Clinical Professor of Radiology.*  
 Norman Zheutlin, M.D., *Associate Clinical Professor of Radiology.*  
 Arthur S. Zimmerman, M.D., *Clinical Instructor in Radiology.*  
 William J. Zontine, D.V.M., *Assistant Clinical Professor of Radiology.*

#### **Requirements for Admission to Graduate Status**

Candidates for admission to graduate status in the Department of Radiology must meet the general requirements set by the Graduate Division for admission to such status.

*Areas of Study.* Study in the fields of radiation physics, radiation biology, radiation

chemistry, and nuclear medicine will be open to qualified candidates.

#### **Requirements for the Degree of Master of Science in Medical Physics (Radiology)**

*General University Requirements.* Candidates for the Master of Science degree in

the radiological sciences must meet the general requirements set by the Graduate Division for this degree. The candidate must elect either the Thesis Plan or the Comprehensive Examination Plan as set forth in this bulletin.

**Departmental Requirements.** The student must complete radiology courses 200, 202, 204, 206, 208 and Public Health 160A-160B (Biostatistics). He should have an appropriate background in physics, chemistry, biology and mathematics. At the end of the first year the student will be required to pass a written screening examination based on the material covered in the required radiology courses.

#### Requirements for the Doctor's Degree in Medical Physics (Radiology)

**General University Requirements.** Candidates for the doctorate in medical physics (radiology) must meet the general requirements set by the Graduate Division for this degree. The foreign languages requirement may be satisfied by demonstrating a reading knowledge of two languages or one language and an approved substitute program. It should be noted that the student must pass a series of written and oral examinations before admission to candidacy.

**Departmental Requirements.** (1) Admission to Candidacy. Admission to candidacy is granted only after the student has passed a preliminary written screening examination and a qualifying oral examination in the physical, biological, and chemical foundations of medical physics. This examination may not be taken more than twice. The student's guidance committee will be appointed by the Chairman of the Department upon admission to regular status in the Department. (2) Normally graduate students will be expected to take courses 200, 202, 204, 206, 208, 260 and 262. The guidance committee may recommend the completion of additional courses as appropriate for the development of the student.

It should be noted that the doctorate in medical physics (radiology) is not granted merely upon completion of routine requirements as to examinations, courses and disertation; fulfillment of such requirements is a prerequisite. The doctor's degree will be granted only to students who have clearly demonstrated both an adequate grasp of a broad field of knowledge and an ability to contribute to that field of knowledge by original and independent research.

#### Graduate Courses

##### 200A-200B-200C. Radioactivity-Principles and Measurements.

(Formerly numbered 200 and 201.) Lecture, one hour; laboratory, three hours. Natural and induced radioactivity, interactions of nuclear radiations with matter, decay schemes, counting statistics, nuclear reactions; isotope methodology, instrumentation, and radiation safety.

Mr. Greenfield, Mr. Libby, Mr. Norman

##### 202A-202D. Applications of Medical Physics to Clinical Problems.

###### 202A-202B. Nuclear Medicine.

Laboratory four hours. Offered alternate quarters. Mr. Bennett

###### 202C. Diagnostic Radiology.

Laboratory four hours. Mr. Steckel

###### 202D. Radiation Therapy.

Laboratory four hours. The Staff

##### 204. Introductory Radiation Biology.

Lecture, three hours. Effects of ionizing radiation on chemical and biological systems. Mr. Riley

##### 206A-206B-206C. Radiological Physics.

(½ course each)

Lecture, one hour. Production and properties of X-rays, interaction of X-rays with a scattering medium, radium and radium dosage, radiation protection, clinical applications. Mr. Greenfield

##### 207A-207B-207C. Dosimetry and Health Physics.

Lecture, two hours. Prerequisite: consent of the instructor. The dosimetry of ionizing radiations, the interpretation of physical measurements and dosimetric units, and the philosophy of protection design.

Mr. Morewitz

##### 208A-208B. Medical Physics Laboratory.

(½ to 1 course each)

(Formerly numbered 206C-206D.) Laboratory, four to eight hours. Techniques for measuring ionizing radiation; applications to X-ray and isotope dosimetry, radiation surveys. Mr. Greenfield

##### 209. The Quantitative Culture of Mammalian Cells.

(½ course)

Prerequisite: consent of the instructor. Laboratory, four hours. Techniques for quantitative studies on mammalian cells in vitro with applications to radiation biology, genetics and virology. Mr. Norman

##### 260A-260B-260C. Seminar in Medical Physics.

(½ course each)

(Formerly numbered 260A-260B and 205.) One hour. Joint critical study by students and instructors of the fields of organized knowledge pertaining to radiology. Periodic contributions are made by visiting scientists. Research in progress is discussed.

Mr. Norman

##### 266A-266B-266C. Seminar in Nuclear Medicine.

(½ course each)

(Formerly numbered 260A-260B.) One hour. Topics of current interest in nuclear medicine. Seminar intended for physicians, radiation physicists, and graduate students. Mr. Webber, Mr. MacDonald

## Individual Study and Research

**596. Research in Medical Physics. (½ to 1 course)**

(Formerly numbered 297.) Directed individual study or research. May be taken any number of times for letter grades; only one course may be used for M.S. credit. The Staff

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D.**

May be taken for one quarter only, on a "Satisfactory" (S) or "Unsatisfactory" (U) basis, and is not creditable for the M.S. degree. The Staff

**598. Research for the Preparation of the Master's Thesis.**

(Formerly numbered 297.) May be taken any number of times on a "Satisfactory" (S) or "Unsatisfactory" (U) basis. A maximum of two courses, for 598 and 596 combined, may be used for M.S. credit. The Staff

**599. Research on Dissertation. (1 to 3 courses)**

(Formerly numbered 299.) Prerequisite: advancement to candidacy. Research for and preparation of the doctoral dissertation. May be taken any number of times on a "Satisfactory" (S) or "Unsatisfactory" (U) basis. The Staff

**Residency Training and Postdoctoral Graduate Work**

A four-year residency training program in straight diagnosis or combined diagnosis and therapy is offered in the Department of Radiology. A three-year residency training program in therapeutic radiology is offered. These programs lead to a certificate awarded by the School of Medicine and the Department of Radiology. Requests for information concerning prerequisites and application for appointment may be addressed to the office of the Chairman, Department of Radiology, University of California, Los Angeles, California 90024.

**Research**

Investigative activities are encouraged throughout the Department, and other departments are encouraged to make use of the personnel and facilities of the Department of Radiology in research pertaining to radiology.

**ROMANCE LANGUAGES AND LITERATURES**

*Committee in Charge:* C. P. Otero (Chairman), G. Cecchetti, M. Cottino-Jones, F. J. Crowley, D. F. Fogelquist, C. L. Hulet, M. S. La Du.

Candidates for the degree of Doctor of Philosophy in Romance languages and literatures will be accepted with major fields in the departments of French, Italian, or Spanish and Portuguese. The requirements listed below should be regarded as minimum requirements; guidance committees may supplement those listed.

**Minimum Prerequisites for Admission to the Program**

1. An M.A. degree at the University of California, or the passing of the *Qualifying Examination, Part I*, in one of the three participating departments and the recommendation of his Department to enter the program. The candidate with an M.A. from another university can be admitted provisionally, and will be confirmed after two quarters of satisfactory work in the program.

2. At the time of admission, the candidate must have demonstrated a reading knowledge of at least one of the two Romance languages chosen as minors. A reading knowledge of a second language chosen as a minor should be acquired, at the latest, during the first year of

studies. To enter the program with emphasis on linguistics, the student must have Latin 3 or the equivalent.

**Minimum Requirements for the Degree**

1. The completion of a program of study which will satisfy the general prescriptions of the "Doctor of Philosophy Degree," as set forth on page 156 of this bulletin.

2. Within the general field of Romance Languages and Literatures, specialization is required in either linguistics or literature. (a) The program with emphasis on linguistics will comprise one major field and three minor fields of which at least two must be other Romance languages. (b) The program with emphasis on literature will consist of one major field, and three minor fields of which two, together with the major field must be concentrated in one period of literature. The major field will normally coincide with the body of studies represented by the masters degree held by the student.

3. During the first year of graduate study, the student entering the program will be required to pass the standard reading examination in German. Substitution of another language for German will be accepted, if approved by the Guidance Committee, only in the case of students entering the program with emphasis on literature.

## ■ SLAVIC LANGUAGES

(Department Office, 5288 Bunche Hall)

Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*

Thomas Eekman, Ph.D., *Professor of Slavic Languages (Chairman of the Department).*

Kenneth E. Harper, Ph.D., *Professor of Slavic Languages (Vice-Chairman of the Department).*

Alexander V. Isačenko, Ph.D., *Professor of Slavic Languages.*

Vladimir Markov, Ph.D., *Professor of Slavic Languages.*

Dean S. Worth, Ph.D., *Professor of Slavic Languages.*

Gerta H. Worth, Ph.D., *Professor of Slavic Languages.*

Alexander Albin, Ph.D., *Assistant Professor of Slavic Languages.*

Michael S. Flier, Ph.D., *Assistant Professor of Slavic Languages.*

Peter Hodgson, Jr., Ph.D., *Assistant Professor of Slavic Languages.*

Zlata Meyerstein, Ph.D., *Assistant Professor of Slavic Languages.*

Michael Shapiro, Ph.D., *Assistant Professor of Slavic Languages.*



Edward Denzler, M.A., *Lecturer in Slavic Languages.*

Margarita Gisetti, M.A., *Lecturer in Slavic Languages.*

### Preparation for the Major

Required courses: Russian 1, 2, 3, 4, 5, 6, Slavic 99A-99B. Note: courses Russian 119 and 120A-120B may be taken in the sophomore year.

### The Major

Required courses: Russian 101A-101B-101C, 119, 120A-120B, 121, 122, 123 and five courses chosen from Russian 130A-130B-130C, 140A-140B-140C-140D, 150, Polish 152A-152B, Czech 155A-155B, Serbo-croatian 154A-154B. Note: not more than one eight-unit course in Polish, Czech or Yugoslav literature may apply toward the major.

Students intending to continue into graduate school should note that several graduate courses (numbered below 220) may be taken by qualified seniors with permission of the instructor and the graduate adviser.

### Admission to Graduate Status

The completion of the undergraduate major or its equivalent is required. Students entering from other institutions will be asked to make up any deficiencies before being admitted to most graduate courses.

### Requirements for the Master's Degree

1. For the general requirements, see pages 153-154. The Department follows the Comprehensive Examination Plan. The M.A. is weighted towards either Linguistics or Literature, but all candidates are expected to

have a sound general knowledge of both Russian linguistics and Russian literary history.

2. Application for advancement to candidacy may be made when the student has passed the reading examination in French or German and no later than the second week of the quarter in which the candidate expects to take his examinations. The French or German examination must be passed no later than the end of the quarter preceding the quarter in which the candidate expects to take his examination.

3. *Course requirements.* Required of all M.A. candidates: Russian 102A-102B-102C, 204, 212 and 213. In addition, candidates for the M.A. (Linguistics) must take Slavic 201 and 202, and candidates for the M.A. (Literature) must take Russian 211 and one other literature course in the Department. Note: most of the courses required for the M.A. are open to qualified seniors with the permission of the instructor and the graduate adviser.

4. A written examination, based on course work and the departmental reading list, will cover either (a) Linguistics, including a thorough knowledge of Russian phonology and grammar and an acquaintance with Comparative Slavic Linguistics, Old Church Slavic, and the history of the Russian literary language; or (b) Literature, including an acquaintance with the entire history of Russian literature from its origins to the present and a thorough knowledge of the major develop-

ments and figures of the nineteenth and early twentieth centuries.

5. A final oral examination will test the student in the fields of his major interest and on his general background. It may be conducted partly in Russian.

6. *Statute of limitations.* The Department does not encourage part-time or non-resident M.A. candidates. The M.A. examinations must be taken within two calendar years from the time of admission to the Graduate Division (time spent in removing deficiencies, to a maximum of one year, does not count toward this two-year period).

7. Students who fail either the written or the oral examination may retake it once, not later than one calendar year after the first attempt.

8. A grade of "High Pass" on the M.A. examinations is one of the conditions for admission to the Department's doctoral program (see below). M.A. candidates who intend to continue toward the Ph.D. should note that courses numbered 220-239, which are required for the Ph.D., may be taken before completion of the M.A.

#### Requirements for the Doctor's Degree

1. For the general requirements, see pages 156-160. The Department's program envisages specialization in either Linguistics or Literature, with Russian as the principal language and literature respectively. By special arrangement, students can specialize in a language or literature other than Russian.

2. *Admission to the doctoral program.* Students may make formal application to the Department for admission to the doctoral program when they have: (1) passed the UCLA M.A. examinations with a grade of "High Pass"; (2) passed the reading examinations in both German and French; (3) taken one year (or the equivalent) of a second Slavic language. Students who received a grade lower than "High Pass" on the UCLA M.A. examinations, and entering students with an M.A. from other institutions, must (re)take the M.A. examinations within one year as a doctoral screening examination, success in which is required for admission to the doctoral program.

3. *Language examinations.* The Department utilizes the ETS examinations in French and German and accepts a passing score of 500. A student proposing to work toward the Ph.D. in Slavic linguistics may, upon Departmental approval, be permitted to sub-

stitute for the 500-point passing score in the second of his French and German examinations (i.e., in the examination in either French or German), a grade of 450 points, plus a reading knowledge of one other language important to the study of Slavic philology, namely: Finnish, Hungarian, Lithuanian, Latvian, Rumanian, or a Turkic language relevant to East or South Slavic historical linguistics, such reading knowledge to be tested in a manner prescribed by the Department Chairman. A reading knowledge of two such languages may, by the same procedure, be substituted for the entire French or (more rarely) German examination.

4. *Course requirements.* For candidates in Linguistics: Slavic 222, 223, 241A, 242, Russian 241, 242, 243A-243B, 265, 266, and one seminar. For candidates in Literature: Slavic 201, two courses chosen from Slavic 230A-230B-230C, one from Russian 251A-251B, and three seminars. Recommended preparation: candidates specializing in Linguistics are advised to take or audit courses 100, 110, 120, 150, 225C in the Department of Linguistics; candidates specializing in Literature are advised to acquire a sound general knowledge of modern Western European literature.

5. *Qualifying examinations.* The nature and scope of a series of written qualifying examinations will be prescribed for each candidate. All candidates are expected to have a sound general knowledge of both Slavic philology and Russian literary history, at least equivalent to that required for the M.A. at UCLA. In addition, candidates specializing in Linguistics and Literature, respectively, will be expected to demonstrate a more detailed mastery of either: (a) Linguistics, including Old Church Slavic, Comparative Slavic Linguistics, and the structure and history of one major and two minor Slavic languages (one from each of the Eastern, Western and Southern groups), which presupposes knowledge equivalent to one additional year's study of the second Slavic language presented for admission to the doctoral program and a reading knowledge equivalent to one year's study of a third Slavic language; or (b) Literature, including the entire body of Russian literature from its origins to the present, and a basic knowledge of comparative Slavic literary history, which presupposes a knowledge of the major figures and developments in the literature of at least one Slavic country other than Russia.

6. Students who fail either the written or the oral qualifying examination may retake it

once, not later than one calendar year after the first attempt.

7. *Statue of limitations.* The qualifying examinations must be taken within two years of the date of admission to the doctoral program. The dissertation must be completed within three calendar years of the date when the qualifying examinations are passed.

## Slavic

### 99. Slavic Peoples and Cultures.

Four hours weekly. Mr. Birnbaum, Mr. Isačenko

### 199. Special Studies.

No scheduled hours. Prerequisite: senior standing and consent of instructor. The Staff

#### Graduate Linguistic Courses

### 201. Introduction to Old Church Slavic.

(Formerly numbered 220A.) Three hours weekly. Introduction to phonology and grammar; readings. Required for the M.A. (Linguistics) and Ph.D. (Linguistics, Literature). The Staff

### 202. Introduction to Comparative Slavic Linguistics.

(Formerly numbered 222A.) Three hours weekly. Introduction to the comparative phonology and grammar of the Slavic languages. Required for the M.A. (Linguistics) and Ph.D. (Linguistics). The Staff

### 222. Introduction to Western Slavic Languages.

(Formerly numbered 226A.) Three hours weekly. Prerequisite: course 202. Recommended preparation: Czech 102A-102B-102C or Polish 102A-102B-102C. Introduction to the structure and history of the Western Slavic languages. Required for the Ph.D. (Linguistics). Mr. Birnbaum, Mrs. Meyerstein

### 223. Introduction to Southern Slavic Languages.

(Formerly numbered 228A.) Three hours weekly. Prerequisite: course 202. Recommended preparation: Serbocroatian 103A-103B-103C. Introduction to the structure and history of the Southern Slavic languages. Required for the Ph.D. (Linguistics). Mr. Albin

### 224. Introduction to Ukrainian and Belorussian.

(Formerly numbered 227C.) Three hours weekly. Prerequisite: course 202. Introduction to the history and structure of Ukrainian and Belorussian as contrasted to Russian. Mrs. Worth

### 225. Typology of Slavic Languages.

(Same as Linguistics 225C.) Three hours weekly. Introduction to structural typology of Slavic languages; comparison with non-Slavic languages. Mr. Birnbaum, Mr. Isačenko, Mr. Worth

### 241A-241B. Advanced Old Church Slavic.

(Formerly numbered 220B.) Three hours weekly. Prerequisite: course 201. 241A. Advanced readings in canonical texts. 241B. East, West and South Slavic recensions of Church Slavic. Course 241A only is required for the Ph.D. (Linguistics). Mr. Birnbaum, Mrs. Worth

### 242. Comparative Slavic Linguistics.

(Formerly numbered 222A-222B.) Three hours weekly. Prerequisite: course 202. Indo-European to Common Slavic and the development of Common Slavic. Required for the Ph.D. (Linguistics). Mr. Birnbaum, Mr. Isačenko

### 261. Slavic Paleography.

(Formerly numbered 220C.) Three hours weekly. Prerequisite: course 201. Introduction to Slavic paleography: inscriptions, birchbark letters, Glagolitic and Cyrillic texts. Mr. Birnbaum

### 262A-262B. Western Slavic Linguistics.

(Formerly numbered 226B.) Three hours weekly. Prerequisite: course 222. 262A. Lekhitic. 262B. Czechoslovak, Sorbian. Mr. Birnbaum, Mrs. Meyerstein

### 263A-263B. Southern Slavic Linguistics.

(Formerly numbered 228B.) Three hours weekly. Prerequisite: course 223. 263A. Serbocroatian and Slovene. 263B. Bulgarian and Macedonian. Mr. Albin

### 281. Seminar in Slavic Linguistics.

(Formerly numbered 260.) Three hours weekly. Selected topics in comparative and historical Slavic linguistics. May be repeated for credit with consent of the instructor and graduate adviser. Mr. Birnbaum, Mr. Isačenko, Mrs. Worth

### 282. Seminar in Structural Analysis.

(Formerly numbered 271.) Three hours weekly. Selected topics. May be repeated for credit with consent of the instructor and graduate adviser. Mr. Isačenko, Mr. Shapiro, Mr. Worth

#### Graduate Literature Courses

### 230A-230B-230C. Comparative Slavic Literature.

Three hours weekly. Recommended preparation: upper division courses in Czech, Polish, Russian and Yugoslav literatures. 230A. Middle Ages through Baroque. 230B. Classicism to Romanticism. 230C. Realism to Modernism. Two quarters required for the Ph.D. (Literature). Mr. Birnbaum, Mr. Eekman

### 290. Seminar in Comparative Slavic Literature.

(Formerly numbered 230C.) Three hours weekly. Prerequisites: courses 230A-230B-230C. Selected topics. May be repeated for credit with consent of the instructor and the graduate adviser. Mr. Eekman

### 295. Seminar in Literary Analysis.

(Formerly numbered 265.) Three hours weekly. Selected topics. Mr. Eekman, Mr. Harper, Mr. Markov

#### Individual Study and Research

### 597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ to 2 courses)

Prerequisite: consent of the instructor and the graduate adviser. The Staff

### 599. Research for Dissertation. (½ to 2 courses)

The Staff

# Russian

## Language Courses

### 1. Elementary Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 16. Elementary Russian. (No credit)

Four hours weekly. Reading course for graduate students. Mr. Denzler in charge

### 2. Elementary Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 26. Elementary Russian. (No credit)

Four hours weekly. Reading course for graduate students. Mrs. Gisetti

### 3. Elementary Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 4. Intermediate Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 5. Intermediate Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 6. Intermediate Russian.

Five hours weekly plus one hour per week in laboratory. The Staff

### 101A-101B-101C. Advanced Russian.

Prerequisite: course 6. Three hours of reading and conversation; two hours of grammar.

Mr. Worth in charge

### 102A-102B-102C. Russian Composition and Stylistics.

Prerequisite: course 101C. Emphasis on vocabulary building and writing fluency; reading and linguistic *explication de texte* of largely non-fictional material coordinated with English-Russian translation. Required for the M.A. (Linguistics, Literature).

Mr. Shapiro in charge

### 121. Russian Phonology. (½ course)

Prerequisite: course 6. Introduction to articulatory phonetics, phonemics, morphophonemics.

Mr. Flier, Mr. Shapiro, Mr. Worth

### 122. Russian Morphology. (½ course)

Prerequisite: course 6. Introduction to the flexional and derivational morphology of Russian.

Mr. Flier, Mr. Shapiro, Mr. Worth

### 123. Historical Commentary to Modern Russian. (½ course)

Prerequisite: course 6. Historical explanation of the phonological and morphological anomalies of modern Russian.

Mr. Isačenko, Mrs. Worth

## Literature Courses

### 119. Survey of Russian Literature to Pushkin.

(½ course)

Prerequisite: upper division standing. (Slavic majors should take this course during their sopho-

more year.) Lectures and readings in English.

Mr. Harper, Mr. Hodgson

### 120A-120B. Survey of Russian Literature.

Prerequisite: upper division standing. (Slavic majors should take this course during their sophomore year.) Lectures and readings in English. 120A. Nineteenth Century. 120B. Twentieth Century.

Mr. Eekman, Mr. Harper, Mr. Hodgson

### 124A-124F. Studies in Russian Literature.

Lectures and reading in English. The following writers will be alternately discussed: A. Pushkin; B. Gogol; C. Turgenev; D. Dostoevsky; E. Tolstoy; F. Chekhov.

Mr. Harper, Mr. Hodgson

### 130A-130B-130C. Russian Poetry.

Prerequisite: course 6. Lectures and readings in Russian. 130A. Introduction to analysis of poetic texts. 130B. From mid-eighteenth century through precursors of symbolism. 130C. From late nineteenth century through contemporary Soviet verse.

Mr. Markov, Mr. Shapiro

### 140A-140D. Russian Prose.

Four hours weekly. Prerequisite: course 6. Lectures and reading in Russian. 140A. Major writers from Karamzin to Turgenev; 140B. Dostoevsky to Gorky; 140C. Contemporary writers; 140D. Advanced readings in Russian prose.

Mr. Eekman, Mr. Harper, Mr. Markov

### 150. Russian Folk Literature.

(Formerly numbered 138 and same as Folklore 150.) Four hours weekly. Prerequisite: course 16. Lectures and readings in Russian.

Mr. Markov

### 199. Special Studies.

No scheduled hours. Prerequisite: senior standing and consent of instructor.

The Staff

## Graduate Linguistics Courses

### 203. Higher Course in Russian. (½ course)

Prerequisites: course 102C and consent of the instructor. Comprehensive analysis of selected texts with emphasis on fine points of grammar and usage. May be repeated for credit.

Mr. Isačenko

### 204. Introduction to the History of the Russian Literary Language.

(Formerly numbered 223.) Prerequisites: course 123, Slavic 99. Introductory survey of literary Russian in its cultural and historical setting. Required for the M.A. (Linguistics, Literature).

Mr. Isačenko, Mrs. Worth

### 210. Readings in Russian Historical Texts.

Prerequisites: Slavic 201 or consent of instructor. Readings in early Russian chronicles and other documents of historical interest.

Mr. Worth

### 241. Russian Phonology.

(Formerly numbered 225A.) Prerequisites: courses 102A-102B-102C, 121. Survey of taxonomic and generative theories of Russian phonology. Required for the Ph.D. (Linguistics).

Mr. Flier, Mr. Shapiro, Mr. Worth

### 242. Russian Morphology.

(Formerly numbered 225B.) Prerequisites: courses 102A-102B-102C, 122. Advanced study of flexion and derivation. Required for the Ph.D. (Linguistics).

Mr. Flier, Mr. Shapiro, Mr. Worth



**243A-243B. Historical Phonology and Morphology of Russian. (2 courses)**

(Formerly numbered Slavic 227A-227B.) Three hours weekly. Prerequisite: course 123. Credit and grade to be given only upon the completion of 243B. Evolution of the Russian phonological and grammatical systems from the eleventh to the twentieth century. Required for the Ph.D. (Linguistics).

Mr. Isačenko, Mrs. Worth

**263. Russian Dialectology.**

Three hours weekly. Prerequisites: courses 243A-243B. Introduction to the phonology and grammar of modern Great Russian dialects.

Mr. Shapiro

**264. The Evolution of Literary Russian.**

(Formerly numbered 229A-229B.) Three hours weekly. Prerequisites: course 204, Slavic 201. Lectures and analysis of texts. Eleventh to twentieth centuries.

Mr. Isačenko, Mrs. Worth

**265. Russian Syntax.**

(Formerly numbered 225C.) Three hours weekly. Prerequisites: courses 102A-102B-102C, 121, 122. Survey of traditional and generative approaches to Russian syntax. Required for the Ph.D. (Linguistics).

Mr. Flier, Mr. Isačenko, Mr. Worth

**266. Russian Lexicology.**

Three hours weekly. An introduction to the formal and semantic patterning of the Russian lexicon. Required for the Ph.D. (Linguistics).

Mr. Isačenko

**Graduate Literature Courses****211. Eighteenth Century Russian Literature.**

(Formerly numbered 243.) Three hours weekly. Lectures and readings in major and secondary writers. Required for the M.A. (Literature).

Mr. Markov

**212. Nineteenth Century Russian Literature.**

(Formerly numbered 241.) Three hours weekly. Lectures and readings in major and secondary writers. Required for the M.A. (Linguistics, Literature).

Mr. Eekman, Mr. Harper, Mr. Markov

**213. Twentieth Century Russian Literature.**

(Formerly numbered 242.) Three hours weekly. Lectures and readings in major and secondary writers. Required for the M.A. (Linguistics, Literature).

Mr. Eekman, Mr. Harper, Mr. Markov

**251A-251B. Old Russian Literature.**

(Formerly numbered 240A-240B.) Three hours weekly. 251A. Kievan period. 251B. Feudal disintegration and Muscovite period. One quarter required for the Ph.D. (Literature).

Mr. Birnbaum, Mr. Worth

**270. Russian Poetics.**

Three hours weekly. Prerequisites: courses 130A-130B-130C. Introduction to the technical study of Russian poetics and versification. Recommended as preparation for course 290.

Mr. Markov

**290. Seminar in Russian Poetry.**

(Formerly numbered 256.) Three hours weekly. Prerequisites: courses 130A-130B-130C. Recommended preparation: course 270. Selected authors and works. May be repeated for credit with consent of the instructor and the graduate adviser.

Mr. Markov

**291. Seminar in Old Russian Literature.**

(Formerly numbered 240C.) Three hours weekly. Prerequisite: course 251. Mr. Birnbaum, Mr. Worth

**292. Seminar in Nineteenth Century Russian Literature.**

(Formerly numbered 254.) Three hours weekly. Prerequisite: course 212. Selected authors and works. May be repeated for credit with consent of the instructor and the graduate adviser.

Mr. Eekman, Mr. Harper, Mr. Hodgson

**293. Seminar in Twentieth Century Russian Literature.**

(Formerly numbered 258.) Three hours weekly. Prerequisite: course 213. Selected authors and works. May be repeated for credit with consent of the instructor and the graduate adviser.

Mr. Eekman, Mr. Markov

**294. Seminar in Russian Literary Criticism.**

(Formerly numbered 252.) Three hours weekly. Prerequisites: courses 211, 212, 213. Selected topics. May be repeated for credit with consent of the instructor and the graduate adviser.

Mr. Harper

**Individual Study and Research****597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ to 2 courses)**

Prerequisite: consent of the instructor and the graduate adviser.

The Staff

**Polish****102A-102B-102C. Elementary Polish.**

(Formerly numbered 101A-101B-101C.) Five hours weekly. Basic course in the Polish language.

The Staff

**102D-102E-102F. Advanced Polish.**

(Formerly numbered 101D-101E-101F.) Four hours weekly. Prerequisite: course 102C.

The Staff

**152A-152B. Survey of Polish Literature.**

(Formerly numbered 150.) Four hours weekly. Lectures and readings in English. 152A. From the Middle Ages to Romanticism. 152B. From Realism to the present.

Mr. Eekman

**160. Polish Romanticism.**

Three hours weekly. Prerequisite: course 102C or consent of the instructor. Lectures and readings in Polish romantic writers; comparison of Polish Romanticism with that of other Slavic and Western European literatures.

The Staff

**199. Special Studies.**

No scheduled hours. Prerequisite: senior standing and consent of instructor.

The Staff

**Individual Study and Research****597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D. (½ to 2 courses)**

Prerequisite: consent of the instructor and the graduate adviser.

The Staff

**Czechoslovak**

**102A-102B-102C. Elementary Czech.**  
(Formerly numbered 101A-101B-101C.) Five hours weekly. Basic course in the Czech language.  
Mrs. Meyerstein

**102D-102E-102F. Advanced Czech.**  
(Formerly numbered 101D-101E-101F.) Four hours weekly. Prerequisite: course 102C.  
Mrs. Meyerstein

**155A-155B. Survey of Czech Literature.**  
Four hours weekly. Lectures and reading in English. 155A. From the Middle Ages to Romanticism. 155B. From Realism to the present.

**199. Special Studies.**  
No scheduled hours. Prerequisite: senior standing and consent of instructor.  
The Staff

**Graduate Course**

**222. The Structure of Slovak.**  
Three hours weekly. Prerequisite: Slavic 202; Slavic 222 recommended. Introduction to the phonological and morphological structure of the Slovak language, especially as contrasted with Czech.  
Mr. Isačenko, Mrs. Meyerstein

**Individual Study and Research**

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D.**  
(½ to 2 courses)  
Prerequisite: consent of the instructor and the graduate adviser.  
The Staff

**Serbocroatian**

**103A-103B-103C. Elementary Serbocroatian.**  
(Formerly numbered 101A-101B-101C.) Five hours weekly. Basic course in the Serbocroatian language.  
Mr. Albin

**103D-103E-103F. Advanced Serbocroatian.**  
(Formerly numbered 101D-101E-101F.) Four hours weekly. Prerequisite: course 103C. Mr. Albin

**154A-154B. Survey of Yugoslav Literature.**  
(Formerly numbered 160.) Four hours weekly. Lectures and readings in English. 154A. From the Middle Ages to Romanticism. 154B. From Realism to the present, including folk literature.  
Mr. Albin, Mr. Eckman

**199. Special Studies.**  
No scheduled hours. Prerequisite: senior standing and consent of instructor.  
The Staff

**Individual Study and Research**

**597. Preparation for the Comprehensive Examination for the Master's Degree or the Qualifying Examination for the Ph.D.**  
(½ to 2 courses)  
Prerequisite: consent of the instructor and the graduate adviser.  
The Staff

**Related Courses in Other Departments**

History 146A-146B-146C, 206; Folklore 126, linguistics 100, 110, 120, 150, 225C, as well as several of the graduate courses in Linguistics.

**■ SOCIAL WELFARE**

(Department Office, 238 Social Welfare Building)

- Nathan E. Cohen, Ph.D., *Professor of Social Welfare.*  
Maurice F. Connery, D.S.W., *Professor of Social Welfare (Acting Chairman).*  
Donald S. Howard, Ph.D., L.H.D., *Professor of Social Welfare.*  
Alfred H. Katz, *Professor of Social Welfare and Professor of Public Health.*  
Elliot T. Studd, D.S.W., *Professor of Social Welfare.*  
Eileen Blackey, D.S.W., *Emeritus Professor of Social Welfare.*  
Karl de Schweinitz, L.H.D., *Emeritus Professor of Social Welfare.*  
Olive M. Stone, Ph.D., *Emeritus Professor of Social Welfare.*  
Jerome Cohen, D.S.S., *Associate Professor of Social Welfare.*  
Douglas G. Glasgow, D.S.W., *Associate Professor of Social Welfare.*  
Warren Haggstrom, Ph.D., *Associate Professor of Social Welfare.*  
Harry H. L. Kitano, Ph.D., *Associate Professor of Social Welfare.*  
Robert Brockman, D.S.W., *Assistant Professor of Social Welfare.*  
Roderic Gorney, M.D., *Assistant Professor of Social Welfare and Assistant Professor of Psychiatry in Residence.*  
Harry Wasserman, D.S.W., *Assistant Professor of Social Welfare.*



- Rosalyn Benitez, M.S.W., *Field Work Consultant.*  
Ester Bentley, M.S.W., *Field Work Consultant.*  
Jane Bullions, M.S.W., *Field Work Consultant.*

William Clarke, M.S.W., *Field Work Consultant.*

Elsie Giorgi, M.D., *Lecturer in Human Behavior.*

Jeanne M. Giovannoni, Ph.D., *Acting Associate Professor of Social Welfare.*

Katherine M. Kolodziejski, M.S.W., *Field Work Consultant.*

Myra Koplin, M.S.W., *Field Work Consultant.*

Porfirio J. Miranda, M.S.S.A., *Lecturer in Social Welfare.*

June W. Moore, M.S.W., *Field Work Consultant.*

Peter Sandi, M.S.W., Jur.D., *Field Work Consultant.*

Gertrude Saxton, M.A., *Field Work Consultant.*

Doris Seder, Ph.D., *Acting Associate Professor of Social Welfare.*

Winifred E. Smith, M.S.W., *Lecturer in Social Welfare and Coordinator of Field Instruction.*

Constance L. Williams, M.S.W., *Field Work Consultant.*

Laura S. Wiltz, M.S., *Field Work Consultant.*

### Doctor of Social Welfare Degree

The School of Social Welfare offers a doctoral program leading to the degree of D.S.W. (Doctor of Social Welfare). The program is designed to prepare students for careers in policy development, administrative positions related to social welfare, practice, research, and teaching. The curriculum is organized into the following major areas: Social welfare policy and planning; research; social welfare among and in different countries, with special emphasis on Latin America; methods of social work practice; and, "grass roots" and neighborhood organization for disadvantaged groups. Programs of study are planned in relation to the special interests of students.

Admission requirements include meeting the general admission standards of the Graduate Division, and an M.S.W. from an accredited School of Social Work. Students possessing a Master's degree in a social science may also be admitted under a plan which involves a period of study in the M.S.W. program to provide the necessary foundation in the distinctive subject matter of the profession. The length and nature of the program is to be determined by the Doctoral Committee in relation to the special needs of students. Enrollment in the doctoral program is limited, and it may not be possible to accept all applicants who meet the formal qualifications for admission.

Graduate Advisor: Consult the departmental Office of Admissions, 238 Social Welfare Building.

#### Graduate Courses

### 201A-201B-201C. Dynamics of Human Behavior I, II, III. (½ course each)

Lecture, two hours; laboratory, one hour. Credit to be given at the completion of the sequence 201A-

201B; 201C will be graded separately. Biopsychosocial factors associated with individual and group behavior and development as applicable in the social functioning of individuals and groups. Emphasis is on theoretical issues and research evidence which contribute to a unified theory of human development. Mr. J. Cohen, Mr. Connery, Miss Giorgi

### 202A-202B. Dynamics of Human Behavior:

#### Deviance IV, V. (½ course each)

Prerequisite: courses 201A-201B-201C. Credit to be given only at the completion of the sequence. This course deals with deviations and pathologies or stresses in the physical, emotional and social areas of human functioning as those problems relate to the role and function of the social worker.

Mr. J. Cohen, Miss Seder, Mr. Wasserman and Staff

### 203. Integrative Theory and Research in Human and Social Behavior. (½ course)

An integrative course which brings together the preceding courses in the human behavior and the social environment series, by examination at an advanced level of the major theoretical strands and the identification of problem areas requiring further research.

The Staff

### 204A. Social Systems in Social Welfare. (½ course)

The application of social system theory to the problems of social welfare and social work. Analysis of the network of community relationships, values, stratification, institutions and subcultures as related to the premises and services of social work.

The Staff

### 204B. Small Groups in Social Welfare. (½ course)

Application of theory and knowledge of small group functioning to problems of working with groups in social work settings. Analysis of group formation, structure of interaction and communication patterns, and of leadership and morale problems. Application to family, peer and special-purpose groups.

The Staff

### 205. Group Conflict and Change. (½ course)

Study of the phenomena of group conflict and change as they appear in the social welfare matrix of groups, communities and social institutions; relationship between conflict and social and cultural change; major research contributions in understanding of these phenomena.

The Staff

**220. History and Philosophy of Social Welfare.****(½ course)**

The history of social work as a field; body of knowledge, method and process, and point of view analyzed within the context of the economic, political, social, philosophical and scientific climate of the period.

Mr. N. Cohen, Mr. Wasserman

**221A. Social Welfare Policy and Services I.****(½ course)**

Nature, roles and history of welfare institutions in different societies; applicable social system theory with special reference to values as seen by different components of the welfare system; theory and research about needs met and not met, about various welfare policies and organizational forms, and about social change to prevent needs.

The Staff

**221B. Social Welfare Policy and Services II.****(½ course)**

Prerequisite: consent of the instructor. Study of income-maintenance policy and services. Introduces theory and research about selected levels of living, regularity and source of income, and their relevance for family and social well-being; analysis of various income-maintenance policies and services; causes and nature of poverty. Current antipoverty legislation.

The Staff

**222. Social Welfare Administration. (½ course)**

Study of methods by which welfare policies are formulated and translated into action; the nature of organizational and research process involved in welfare administration; role of welfare agency personnel in policy formulation, implementation and evaluation.

The Staff

**223. Seminar on the Social Work Profession.****(½ course)**

The nature and role of social work in contemporary society; relationships with other professions; probable future trends in the profession; social work ethics, professional organizations, certification licensing; professional responsibility for continued self-criticism and improvement of the profession.

The Staff

**230A-230B-230C. Theory of Social Work Method****(Individuals and Small Groups) I, II, III.****(½ course each)**

Credit to be given only at the completion of the sequence. Concurrent social work practicum is required. An introduction to the theory of social work with individuals and small groups and to the principles of practice which are derivative of this and related theory.

The Staff

**231A-231B. Advanced Theory of Social Work****Method (Individuals and Small Groups) IV, V.****(½ course each)**

Credit to be given only at the completion of the sequence. Required: Concurrent social work practicum. Advanced-level, critical analysis of theories, concepts and principles underlying social casework practice. Specific attention to deviation and stress as conditions affecting functioning of individuals and groups; and to diagnostic knowledge and competence required in rehabilitation and prevention.

Mr. Connery and Staff

**240A-240B-240C. Theory of Social Work Method****(Community Organization) I, II, III.****(½ course each)**

Credit to be given only at the completion of the full sequence. Concurrent practicum in social work required. Covers historical and theoretical developments in community organization; understanding the community as a social system; role of the practitioner in identification, analysis and evaluation of needs, existing programs, policies, structure and strategies of intervention.

Mr. Haggstrom

**241A-241B. Advanced Theory of Social Work****Method (Community Organization) IV, V.****(½ course each)**

Credit to be given only at the completion of the sequence. Concurrent practicum in social work required. Emphasis on various patterns of community action for attaining social welfare objectives; research and field experience directed toward study of social problems within the context of community planning; emerging patterns of physical, economic and social planning within the framework of social change theory.

Mr. N. Cohen, Mr. Haggstrom

**280. Social Welfare Research. (½ course)**

Sources, nature and uses of social work theory and research-based knowledge and of broader social data relevant to social welfare activities. Critical analysis of major methods of developing scientific knowledge.

The Research Staff

**281A-281B-281C. Advanced Social Welfare****Research. (½ course each)**

Credit to be given only at the completion of the sequence. Group research projects requiring intensive examination and analysis of a social problem area directed toward the development of research knowledge and techniques for social work practice.

The Research Staff

**290A-290B-290C. Seminar in Social Work.****(½ course each)**

A series of seminars dealing with trends in social work and social welfare, with the focus on current social problems affecting individuals, groups, and communities and new patterns of intervention based on recent demonstrations and research.

The Staff

**Professional Courses****401A-401B-401C. Practicum in Social Work.**

Credit to be given only at the completion of the full sequence. Educationally directed practicum conducted in selected health, welfare and educational facilities. The major objective is to provide opportunities for the student to test his theoretical knowledge and to acquire a disciplined practice foundation in his profession.

The Field Instruction Staff

**402A-402B-402C. Advanced Practicum in Social****Work. (1½ courses each)**

Credit to be given only at the completion of the full sequence. Practicum in social work is arranged for the student in keeping with his major field of study.

The Field Instruction Staff

**Individual Study and Research****596. Special Study and Research for M.A. Degree****Candidates. (½, 1 and 1½ courses)**

Individual programming for selected students to permit pursuit of a subject in greater depth.

## ■ SOCIOLOGY

(Department Office, 264 Haines Hall)

- Melville Dalton, Ph.D., *Professor of Sociology.*  
 Harold Garfinkel, Ph.D., *Professor of Sociology.*  
 Walter R. Goldschmidt, Ph.D., *Professor of Anthropology and Sociology.*  
 C. Wayne Gordon, Ph.D., *Professor of Sociology and Education.*  
 Oscar Grusky, Ph.D., *Professor of Sociology.*  
 Leo J. Kuper, Ph.D., *Professor of Sociology.*  
 Richard T. Morris, Ph.D., *Professor of Sociology.*  
 Leo G. Reeder, Ph.D., *Professor of Sociology and Public Health.*  
 Svend Riemer, Ph.D., *Professor of Sociology.*  
 Georges Sabagh, Ph.D., *Professor of Sociology (Chairman of the Department).*  
 Melvin Seeman, Ph.D., *Professor of Sociology.*  
 Gerald H. Shure, Ph.D., *Professor of Sociology and Psychology.*  
 Ralph H. Turner, Ph.D., *Professor of Sociology and Anthropology.*  
 Ralph L. Beals, Ph.D., *Emeritus Professor of Anthropology and Sociology.*  
 John E. Horton, Ph.D., *Associate Professor of Sociology.*  
 Gene N. Levine, Ph.D., *Associate Professor of Sociology.*  
 Peter A. Orleans, Ph.D., *Associate Professor of Sociology (Vice-Chairman of the Department).*  
 Samuel J. Surace, Ph.D., *Associate Professor of Sociology.*  
 Kenneth D. Bailey, Ph.D., *Assistant Professor of Sociology.*  
 Phillip Bonacich, Ph.D., *Assistant Professor of Sociology.*  
 Richard P. Boyle, Ph.D., *Assistant Professor of Sociology.*  
 Howard Elinson, Ph.D., *Assistant Professor of Sociology.*  
 Robert M. Emerson, Ph.D., *Assistant Professor of Sociology.*  
 Samuel Farber, Ph.D., *Assistant Professor of Sociology.*  
 Ivan H. Light, Ph.D., *Assistant Professor of Sociology.*  
 George A. Miller, Ph.D., *Assistant Professor of Sociology.*  
 Jerome Rabow, Ph.D., *Assistant Professor of Sociology.*  
 Warren D. TenHouten, Ph.D., *Assistant Professor of Sociology.*  
 Andrea Tyree, Ph.D., *Assistant Professor of Sociology.*  
 ———, *Assistant Professor of Sociology.*  
 ———, *Assistant Professor of Sociology.*  
 ———, *Assistant Professor of Sociology.*  
 ———, *Assistant Professor of Sociology.*



- John A. Davis, M.A., *Acting Assistant Professor of Sociology.*  
 Samuel R. Friedman, M.A., *Acting Assistant Professor of Sociology.*  
 David O'Shea, Ph.D., *Acting Assistant Professor of Sociology and Education.*  
 Melvin Pollner, M.A., *Acting Assistant Professor of Sociology.*

### Preparation for the Major

Required: courses 1 or 101, 17, 18, and 19, and fulfillment of the general requirements of the University and the College of Letters and Science. Mathematics 50, Economics 140, Psychology 141, or Public Health 160A may be substituted for Sociology 18. Transfer students who have two or more quarters of introductory level courses

in sociology at the time of transfer will not be required to take Sociology 1 or 17. Recommended: Anthropology 1A or 11, and 22 or 5A-5B-5C; Economics 1 and 2; English 2; Geography 1A-1B; Mathematics 2A-2B-2C, and 12A, or Mathematics 100; Philosophy 6 and 7, or 20 and 21; Political Science 1 and 2; Psychology 10. The student should consult a detailed statement of requirements

and recommendations available at the departmental office. Each student must apply to the Department for the assignment of an adviser.

#### **The Major**

A total of 14 upper division courses, ten in the Department not including course 101 and four outside, are required for the major. The 14 courses must include the following: (1) at least two courses in each of three core areas; (2) course 111, 112, or 113, which may also be counted as one of the courses in core area I; (3) four courses chosen from one or more of the following fields: anthropology, economics, geography, history, political science, psychology.

#### **Social Welfare**

A student whose primary interest is in social welfare may either fulfill the requirements of the major in sociology or of the curriculum in presocial welfare. Students planning for graduate training in social welfare at this University should consult the UCLA ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

#### **Requirements for the Master's Degree**

For the M.A. degree in sociology, the student is required (1) to complete an acceptable program of a minimum of nine upper division and graduate level courses (the equivalent of 4 quarter units each) of which at least six courses must be graduate level (200 series) in sociology; (2) to pass two departmental examinations in statistics or complete courses 110A-110B with grades of C or better; (3) to complete one of the two-quarter methodology sequences in the series numbered 211-218; and (4) to pass a written comprehensive examination. Those students who plan to seek the Ph.D. are advised to pass the foreign language examination some time during their first year of graduate study. The M.A. degree is especially intended to qualify students who plan to become junior college teachers. Students are encouraged to plan their programs so as to fulfill the requirements for the junior college or secondary teaching credentials. Details on credential matters may be obtained from the Credentials Counselor in the School of Education.

#### **Requirements for the Ph.D. Degree**

Candidates for the doctor's degree must conform to the general requirements set by the Graduate Division for the Ph.D. degree. It should be emphasized that the granting of the doctor's degree does not depend alone

upon the satisfactory completion of a specified number of courses. The candidate must demonstrate his competence as a research scholar and his ability to give instruction in his field.

In addition to the general requirements set by the Graduate Division, every prospective candidate for the doctor's degree must: (1) pass a reading examination in French, German, Spanish, Italian, Russian, or other language approved by the Department; (2) pass two departmental examinations in statistics or complete courses 110A-110B with grades of C or better; (3) complete two of the two-quarter methodology sequences in the series numbered 211-218; (4) pass a written comprehensive examination; (5) pass written examinations in two special fields; (6) pass a qualifying oral examination; (7) prepare a satisfactory doctoral dissertation embodying the results of original research; (8) pass a final oral examination. Details of these requirements are described in a syllabus which may be secured from the office of the Department.

The dissertation and the final oral examination will be in accordance with the requirements of the Graduate Division. Before the dissertation is begun, the subject must be approved in writing by the student's graduate advisers.

#### **Requirements for the Ph.D. in Anthropology-Sociology (Interdepartmental)**

The Ph.D. in Anthropology-Sociology is awarded upon demonstration of an integrated command of the two disciplines and completion of a dissertation that demonstrates research competence relevant to both. For admission to this program, the student must have completed the Bachelor's degree with an undergraduate major in either Anthropology or Sociology (or equivalent work) and must be acceptable for graduate standing in both departments. Upon admission to the program, the student is assigned a guidance committee consisting of two members from Anthropology and two from Sociology, to be appointed by the interdepartmental degree committee. This committee, in consultation with the student, formulates the program of work which will be submitted to both departments for approval. Candidates will conform to the general requirements for the Ph.D. set forth by the Graduate Division. The student may follow the language requirement of either department.

The student must demonstrate his competence in theory, methods of research, and

a special field for both disciplines. (1) Competence must be demonstrated in ethnological theory by satisfactory completion of Anthropology 202 and a special essay in this area, and in sociological theory by passing the General Theory section of the Department's Comprehensive Examination at the level required for the Ph.D. in Sociology. (2) The student must satisfactorily complete the graduate methods course and supervised field training in Anthropology, Sociology 18 (or its equivalent), Sociology 110A, and any one of the two-quarter sequences in the Sociology 211-218 series. The student may be exempted from Sociology 18, 110A, or both on the basis of the examination. (3) A special field in Anthropology and a special field in Sociology will be established for each student so as to form a coherent unit. The student must pass an examination in each field.

#### Lower Division Courses

##### 1. Introductory Sociology.

No credit will be given for this course to students who have completed Sociology 101. Survey of the characteristics of social life, the processes of social interaction, and the tools of sociological investigation. The Staff

##### 17. Sociological Analysis.

(Formerly numbered 1B.) Prerequisite: course 1 or 101. Required of majors. Development and application of the basic tools and concepts of course 1 by means of an examination of selected monographic works. The Staff

##### 18. Interpretation of Quantitative Data.

Prerequisite: course 1 or 101, or may be taken concurrently. Satisfies the statistics requirement for the major in sociology. The interpretation of statistical measures, tables, and graphs of the types most frequently encountered in sociological literature. Mr. Slatin, Mr. TenHouten

##### 19. Introduction to Sociological Research Methods.

(Formerly numbered 117.) A systematic treatment of the logic of qualitative and semiquantitative skills of use in sociological research, e.g., classification, questionnaire and schedule design, content analysis, critical analysis of studies, conceptual analysis of case material. Mr. Bailey, Mr. TenHouten

#### Upper Division Courses

Course 1 or 101, or the equivalent, and upper division standing are prerequisite to all upper division courses in sociology unless otherwise stated.

##### 101. Principles of Sociology.

No credit will be given for this course if course 1 has been completed. For upper division students who have not taken Sociology 1. A more intensive introduction to sociology than is given in course 1. May not be counted as fulfilling the requirements of the field of concentration. The Staff

#### CORE AREA I: THEORY AND METHOD

##### 110A. Intermediate Quantitative Methods I.

(Numbered 110 in 1966-67.) Prerequisite: courses 17 and 19, and course 18, Mathematics 50, or some other courses in statistics approved by the Department. Required for the M.A. and Ph.D. degrees in sociology. A brief systematic course in the logic and practice of statistical methods of use to sociologists. Mr. Bonacich, Mr. TenHouten

##### 110B. Intermediate Quantitative Methods II.

(Numbered 210 in 1966-67.) Prerequisite: course 110A and consent of the instructor. Required for the M.A. and Ph.D. degrees in sociology. A continuation of 110A. Analysis of variance, correlation, regression analysis, non-parametric methods. Mr. Boyle, Mr. TenHouten

##### 111. Backgrounds of Sociological Thought.

(Formerly numbered 170.) Survey of attempts, from early literate societies to the twentieth century, to understand the nature of man and society; the social origins of this intellectual background; the course of these ideas in the development of sociological theory. Mr. Dalton

##### 112. Development of Sociological Theory.

(Formerly numbered 171.) A comparative survey of basic concepts and theories in sociology, 1850-1920; the codification of analytic schemes; a critical analysis of trends in theory construction. Mr. Horton, Mr. Morris

##### 113. Contemporary Sociological Theory.

(Formerly numbered 172.) A critical examination of significant theoretical formulations, 1920 to the present; an analysis of the relation between theoretical development and current research emphasis. Mr. Morris

#### CORE AREA II: SOCIAL STRUCTURE AND CHANGE

##### 120. Social Change.

(Formerly numbered 122.) A study of patterns of social change, resistance to change, and change-producing agencies and processes.

##### 121. Formal Organizations.

(Formerly numbered 128.) Sociological analysis of organizations. An introduction to basic theories, concepts, methods and research in this field of study. Mr. Grusky, Mr. Miller, Mr. Surace

##### 122. Mass Communications.

(Formerly numbered 129.) Formal organization, functions, and development of the mass media; communications as a social process; cultural patterns; audience characteristics; communications and bureaucracy. Aspects of the American media are compared with other systems, e.g., Soviet, British, Arabic.

##### 123. Social Stratification.

(Formerly numbered 135.) An analysis of American social structure in terms of evaluational differentiation. Topics to be considered include criteria for differentiation, bases for evaluation, types of stratification, the composition of strata and status systems, mobility, consequences of stratification and problems of methodology. Miss Tyree

**124. Ethnic and Status Groups.**

(Formerly numbered 190.) The characteristics of the "visible" ethnic groups, e.g., Japanese, Mexican and Negro; their organization, acculturation, and differentiation. The development, operation and effects of selective immigration and population mobility. The status of the chief minorities in the continental U. S., with comparative materials drawn from Jamaica, Hawaii, and other areas.  
Mr. Elinson, Mr. Farber, Mr. Kuper

**125. Urban Sociology.**

(Formerly numbered 143.) Urban and rural cultures, the characteristics of cities in Western civilization, with emphasis on the American metropolis.  
Mr. Bailey, Mr. Orleans, Mr. Riemer

**126. Population Problems.**

(Formerly numbered 186.) Implications for social organization and social policy of population size and composition, birth and death rates. Consideration of social problems related to population increase, population redistribution, and other trends.  
Mr. Sabagh, Miss Tyree

**127. Language and Society: Introduction to Sociolinguistics.**

(Same as Linguistics 170.) Prerequisites: course 1 or 101 or Anthropology 5A or 22. Study of the patterned covariation of language and society; social dialects and social styles in language; problems of multilingual societies.  
Mr. Bright

**129. White Racism.**

Verbal and metaphorical stereotyping of blacks, whites and other subdominant and dominant groups; cross-cultural comparisons; impact of media; institutional racism, educational and economic; political mobilization of black and poor communities; the study of strategies for resisting white racism.  
Mr. TenHouten

**CORE AREA III: COMPARATIVE SOCIETIES**

**130. Social Processes in Africa.**

(Formerly numbered 191A.) A course in comparative sociology. A study of selected processes in African societies, primarily in the fields of urban sociology, social structure and social change, involving an interdisciplinary approach.  
Mr. Kuper

**131. Latin American Societies.**

(Formerly numbered 150 and same as Anthropology 121.) A descriptive survey of the major Latin American societies, emphasizing their historical backgrounds and their emergent characteristics, with special attention to the relations between rural and urban life.  
Mr. Beals

**132. Population and Society in the Middle East.**

(Formerly numbered 166.) Prerequisite: upper division standing and consent of the instructor. A survey of the Middle Eastern societies; their historic and environmental bases; the contemporary demographic and cultural situation.  
Mr. Sabagh

**133. Comparative Sociology of the Middle East.**

Prerequisite: upper division standing and consent of the instructor. A review of the unity of Middle Eastern societies in Islam and their diversity exemplified by such nomadic peoples as the Bedouin,

countries in process of rapid modernization such as Turkey and Israel, colonial situations as in Algeria and Morocco, and underdeveloped areas as Iran and the Arabian countries.  
Mr. Sabagh

**135. West European Society.**

Comparative study of social structure and major institutions of selected Western European nations.  
Mr. Seeman, Mr. Turner

**136. Structure and Process of American Society.**

Analysis of interrelationships among structures and processes in American society, with emphasis on patterns of differentiation, exchange, control, and belief formation. The question of boundary definition (both analytic and real) and the question of order will be considered throughout.  
Mr. Friedman

**CORE AREA IV: INSTITUTIONS**

**140. Political Sociology.**

(Formerly numbered 187.) The contributions of sociology to the study of politics including the analysis of political aspects of social systems, the social context of action, and the social bases of power.  
Mr. Friedman, Mr. Sarace

**141. Industry and Society.**

(Formerly numbered 131.) A sociological analysis of industry. Attention given to factors in the status group awareness and occupational role-learning of workers and managers; interaction between technological and social system; the interplay between official and unofficial action, and between industry and community.  
Mr. Dalton, Mr. Light

**142. Sociology of the Family.**

Theory and research dealing with the modern family, its structure and functions, including historical changes, variant family patterns, family as an institution, and the influence of the contemporary society on the family.  
Mr. Riemer

**143. Sociology of Education.**

(Formerly numbered 180 and same as Education 108.) Studies of social processes and interaction patterns in educational organizations, the relationships of such organizations to aspects of society, social class and power, social relations within the school, formal and informal groups, school culture, roles of teachers, students, and administrators.  
Mr. Gordon

**144. Social Aspects of Housing and City Planning.**

(Formerly numbered 147.) Prerequisite: course 125. Implications for family and urban social relationships of housing floor plans and plans for neighborhoods and cities.  
Mr. Riemer

**145. Sociology of Deviant Behavior.**

(Formerly numbered 120.) An examination of the leading sociological approaches to the study of deviation and a general survey of the major types of deviation in American society.  
Mr. Horton, Mr. Rabow, Mr. Slatin

**146. Criminology.**

(Formerly numbered 182.) Theories of the genesis of crime; factors in the organization of criminal behavior from the points of view of the person and group; criminal behavior systems.  
Mr. Davis, Mr. Rabow



**147. Control of Crime.**

(Formerly numbered 184.) Theories of punishment; methods of dealing with convicts; social organization of police, courts, prisons, probation, and parole. Mr. Rabow

**148. Normal Environments.**

(Formerly numbered 178.) Structural interpretation of the concerted production, management, and alteration of preceivedly normal interpersonal environments. Mr. Garfinkel, Mr. Pollner

**149. A Study of Norms.**

(Formerly numbered 179.) Properties of norms, of normatively governed conduct, of lay and professional methods for describing, producing, using, and validating norms in contrasting settings of socially organized activities; relevance of these properties for the programmatic problems of analytic sociology. Mr. Garfinkel, Mr. Pollner

**CORE AREA V: SOCIAL PSYCHOLOGY****150. Collective Behavior.**

(Formerly numbered 124.) Characteristics of crowds, mobs, publics, social movements, and revolutions. Their relation to social unrest and their role in developing and changing social organization. Mr. Seeman, Mr. Turner

**151. Culture and Personality.**

(Formerly numbered 126.) Theories of the relation of variations in personality to culture and group life, in primitive and modern societies, and the influence of social role on behavior. Mr. Turner

**152. Group Processes.**

(Formerly numbered 161.) Systematic study of the formation, structure, and functioning of groups; analysis of group processes and group products from a variety of theoretical viewpoints; implications of various research techniques. Mr. Bonacich, Mr. Morris

**153. Process and Socialization in the Family.**

(Formerly numbered 162.) Examination of the processes of interaction, decision-making, role differentiation, conflict, integration, and socialization within the family and their interrelations with society. Mr. Turner

**154. Social Psychology: Sociological Approaches.**

(Formerly numbered 183.) A survey of the contribution of sociologists to theory and research in social psychology including theories of social control; conformity and deviation; reference groups; and interaction process. Mr. Grusky, Mr. Miller, Mr. Rabow

**155. Intergroup Conflict and Prejudice.**

(Formerly numbered 189.) A study of the causes and consequences of group conflict, with emphasis upon majority-minority relations, prejudice and discrimination. Special attention is given to alternative sociological and psychological theories of prejudice; the effects of minority status upon the individual; and the possibilities for attitude and behavior change. Mr. Schwartz, Mr. Seeman

**156. Simulation of Social Processes.**

Prerequisite: courses 1, 17, 18. The course focuses on the simulated uses of games to illustrate, elaborate and clarify selected social processes. Games involve "mixed motives." Students are required to be their own ethnographers and to do papers relating readings to the simulations. Mr. Boyle, Mr. Rabow

**Advanced Studies****198. Special Courses. (½ to 2 courses)**

Prerequisite: upper division standing, special requirements necessary for the field selected, and consent of the instructor. Special topics or problems to be offered to the extent justified by student demand. The Staff

**199. Special Studies. (½ to 2 courses)**

Prerequisite: senior standing and consent of the instructor. A course of independent study designed for graduate or senior undergraduate students who (a) desire a more advanced or specialized treatment of an area covered in the regular course list and who present that course as a prerequisite; or (b) desire work in an area of sociological analysis currently not covered by an upper division course. The Staff

**Graduate Courses****201A-201B. Proseminar in Sociology.**

Prerequisite: graduate status. A comprehensive survey of basic concepts and theories in the major fields of sociology. Designed primarily for graduate students in the first year of residence. Mr. Horton, Mr. Morris

**213A-213B. Techniques of Demographic and Ecological Analysis.**

Prerequisite: course 110A or equivalent. Procedures and techniques for the collection, evaluation, and analysis of demographic and ecological data; models of population and ecological structure and change; applications to the study of social structure and social change. Mr. Sabagh

**214A-214B. The Measurement of Sociological Variables.**

Prerequisite: courses 110A-110B and consent of the instructor. Credit to be given only on completion of 214B. Theory and technique of measurement in sociology and social psychology; construction, application, and evaluation of measurement techniques, especially the forms of scaling. Mr. Miller

**215A-215B. Experimental Sociology.**

Prerequisite: course 110A or equivalent and consent of the instructor. A course designed to provide students with the basic fundamentals of the experimental method, particularly as it is used in social psychology. Mr. Grusky, Mr. Rabow, Mr. Slatin

**216A-216B. Survey Research Methods.**

(Formerly numbered 216 and 217.) Credit to be given only on completion of 216B. Course in methodology and techniques: formulation of research problem; study design; hypotheses; sampling; measurement; questionnaire and schedule construction; interviewing and data collection; processing and tabulation; analysis and interpretation; presentation of findings; cross-national, replicative, panel and other complex survey designs. Students participate in survey research project. Mr. Levine

**217A-217B. Ethnographic Field Work.**

Prerequisite: Consent of the instructor. Theories and techniques of ethnographic field work. This course will consider the kinds of problems amenable to ethnographic approaches, methods and techniques for doing field work, and ethnical problems involved in such research. Mr. Emerson, Mr. Orleans

**218A-218B. Ethnomethodological Methods.**

Prerequisite: consent of the instructor. Examination of techniques used in ethnomethodological research, practice in the critical evaluation of research, and directed experience in the conduct of an extended investigation employing ethnomethodological procedures. Mr. Garfinkel

**219. Theory of Sociological Inquiry.**

Prerequisite: course 110A and consent of the instructor. A general review of procedures followed by social scientists in attempts to achieve valid theoretical knowledge. Focuses on inductive inference and theory testing; control and randomization, experimental and nonexperimental research designs, association and causality, models, measurement theory, sampling theory. Mr. TenHouten

**220. Role Theory.**

Prerequisite: graduate status and consent of the instructor. A review of theories and research dealing with social roles, with special emphasis on roles in social interaction and in formation of the social self. Mr. Turner

**222. The Sociology of Adolescence.**

Prerequisite: graduate status and consent of the instructor. An examination of the historical development of adolescent subcultures in primitive, familial, and modern societies; the transition to adulthood, involving socialization by parents, siblings, peers, and teachers; academic performance, and educational and occupational plans of American youth. Mr. TenHouten

**224. Problems in Social Psychology.**

Survey of theories and problems in social psychology with emphasis on the major sociological contributions to this area. Mr. Grusky, Mr. Seeman

**226. Leadership and Comparative Social Structure.**

A comparative analysis of types of leadership in different social structures with particular attention to the recruitment and career patterns of leaders. Mr. Surace

**227. The Sociology of Knowledge.**

Prerequisite: graduate status or consent of the instructor. A survey of theories and research concerning social determinants of systems of knowledge and the role of intellectual and artistic elites in Western societies. Mr. Horton

**230. Theories of Deviance.**

An examination of various sociological approaches to the study of deviant behavior with emphasis on anomie theory as the major orientation today. Special attention given to the problems of defining deviance and the articulation of sociological and psychological levels of explanation. Mr. Slatin

**234. Sociology of Community Organization.**

Prerequisite: graduate status and consent of the instructor. A survey of recent and classical research and literature dealing with predominantly political institutions, the problem of order, and the organization of communal life in the village and the metropolis. Mr. Orleans

**235. Social Structure and Social Movements.**

Prerequisite: graduate status or consent of the instructor. A survey of some social science theories bearing on the analysis of large scale social move-

ments and upheavals. The causes, course and consequences of selected social movements, insurrections and revolutions will be examined. Mr. Kuper

**236. Social Change in the Middle East.**

An analysis of the sources, extent, and types of social change in the Middle East with an emphasis on the origin and consequences of industrialization and urbanization. Mr. Sabagh

**237. Social Stratification in the Middle East.**

Modes of social differentiation in traditional Middle Eastern societies, localism and tribalism, the counter influence of processes leading to the recurrent emergence of societies of large scale and their distinctive structural characteristics. Mr. Sabagh

**245. Urban Spatial Structure and Social Organization.**

Traditional ecological theory and research will be examined, evaluated, and contrasted with recently developed analytical procedures. An approach to the organization of the metropolis through the analysis of spatially distributed and socially differentiated aggregates will be considered. Mr. Orleans

**249A. Sociocultural Aspects of Health and Illness.**

(1/2 course)

(Same as Public Health 249A.) Prerequisites: courses in upper division social sciences, including sociology, anthropology and psychology. Social and community aspects of health, health behavior and health organizations. Mr. Reeder and the Staff

**249B. Sociocultural Aspects of Health and Illness.**

(1/2 course)

(Same as Public Health 249B.) Prerequisites: course 249A or consent of the instructor. Theoretical and conceptual approaches in the behavioral sciences contributing to an understanding of various health conditions and health behavior. Mr. Reeder and the Staff

**Seminars**

**250. Methodological Problems.**

Mr. Boyle, Mr. Seeman

**251. Topics in the Problems of Social Order.**

Mr. Garfinkel

**252. Criminology.**

**253. Quantitative Methods in Sociology.**

Mr. Bonacich, Mr. Levine

**254A-254B. Sociology of Law.**

(Formerly numbered 254.) Social control functions of law and legal institutions with particular attention to the contrast between law-ways of stateless and tribal societies and contemporary American legal processes and institutions, primarily those of criminal law. Mr. Emerson

**255A-255B. Systematic Sociological Theory.**

Course 255A is prerequisite to 255B.

Mr. Boyle, Mr. Kuper

**256. Demography.**

Mr. Sabagh

**257. Sociology of the Arts.**

Mr. Horton

- 258. Sociology of Religion.** Mr. Kuper
- 259. Social Structure and Economic Change: Historical and Comparative Perspectives.** Mr. Surace
- 260. Industry and Society.** Mr. Dalton
- 261. Ethnic Minorities.** Mr. Davis, Mr. Seeman
- 262. Selected Problems in Urban Sociology.** Mr. Riemer
- 263. Social Stratification.** Mr. Morris
- 264. Professions in the American Society.**
- 265. Problems in Organization Theory.** Mr. Grusky
- 267. Selected Problems in Communication.**
- 268. Historical and Interpretive Sociology.** Mr. Dalton
- 269. Collective Behavior.** Mr. Turner
- 270. Selected Problems in Socialization.** Mr. Turner
- 271. Ethnomethodology.** Mr. Garfinkel
- 272. Sociology of Political Movements.** Mr. Elinson, Mr. Kuper
- 273. Attitudes and Social Structure.** Mr. Seeman
- 275. Seminar in Comparative Social Structure: Developed Societies.**  
The comparison of social structures among developed societies, including the comparative analysis of the main institutional features, social class arrangements, social mobility characteristics, and the like. Comparisons will involve the U.S. and developed countries in Western Europe, Asia and Oceania.  
The Staff
- 277. Sociology of Science.** Mr. Miller
- 278. Sociolinguistics.** (Same as Linguistics 265B.) Prerequisite: Linguistics 170. Mr. Bright
- 281. Selected Problems in Mathematical Sociology.** Prerequisite: Mathematics 2C or consent of the instructor. An exploration of some mathematical models of sociological processes. Possible topics include models of small groups, social mobility, kinship relations, organizations, social interaction. Mr. Bonacich
- 282. Organizations and the Professions.** Mr. Miller
- 291. Moral Solidarity in Communities.** Comparative analysis of social solidarity and the collapse of social solidarity in voluntary and traditional communities. Contrasts more and less solidary types with special reference to utopian communities and developmental processes. Mr. Light
- 292A-292B-292C. Research Development.** The Staff
- 293A-293B-293C. Advanced Research.** The Staff  
Individual Study and Research
- 596. Special Problems in Sociology.** (½ or 1 course) The Staff
- 597. Individual Study for Examinations.** Preparation for the comprehensive examination for the master's degree or the qualifying examination for the Ph.D. The Staff
- 598. Research in Sociology for M.A. Degree Candidates.** The Staff
- 599. Research in Sociology for Ph.D. Degree Candidates.** (1 to 2 courses) The Staff

## ■ SPANISH AND PORTUGUESE

(Department Office, 5303 Humanities Building)

- José R. Barcia, Lic. F. y L., *Professor of Spanish.*
- William E. Bull, Ph.D., *Professor of Spanish.*
- John A. Crow, Ph.D., *Professor of Spanish.*
- John E. Englekirk, Ph.D., *Professor of Spanish.*
- Donald F. Fogelquist, Ph.D., *Professor of Spanish (Chairman of the Department).*
- C. P. Otero, Ph.D., *Professor of Spanish and Romance Linguistics (Vice-Chairman of the Department).*
- Stanley L. Robe, Ph.D., *Professor of Spanish.*
- Alberto Machado da Rosa, Ph.D., *Professor of Spanish and Portuguese.*
- Anibal Sánchez-Reulet, Ph.D., *Professor of Spanish.*
- Walter Starkie, Ph.D., *Professor of Spanish in Residence.*
- Hermenegildo Corbató, Ph.D., *Emeritus Professor of Spanish.*
- Manuel Pedro González, Ph.D., *Emeritus Professor of Spanish American Literature.*
- Marion Albert Zeitlin, Ph.D., *Emeritus Professor of Spanish and Portuguese.*
- Rubén Angel Benítez, Ph.D., *Associate Professor of Spanish.*
- Claude L. Hulet, Ph.D., *Associate Professor of Spanish and Portuguese.*

Julio Rodríguez-Puertolas, Ph.D., *Associate Professor of Spanish.*  
 Shirley L. Arora, Ph.D., *Assistant Professor of Spanish.*  
 Edward J. Dudley, Ph.D., *Assistant Professor of Spanish.*  
 Carroll B. Johnson, Ph.D., *Assistant Professor of Spanish.*  
 Richard M. Reeve, Ph.D., *Assistant Professor of Spanish.*  
 Jack Roberts, Jr., Ph.D., *Assistant Professor of Spanish.*  
 Robert S. Rudder, Ph.D., *Assistant Professor of Spanish.*  
 Paul Smith, Ph.D., *Assistant Professor of Spanish.*  
 Maria L. de Lowther, M.A., *Assistant Professor of Spanish, Emeritus.*  
 ———, *Assistant Professor of Spanish.*  
 Emilio Menéndez-Ayuso, Lic. F. y L., *Instructor of Spanish.*



Paulo de Carvalho-Neto, Lic. C. S., *Lecturer in Spanish and Portuguese.*  
 Enrique G. Cortés, M.A., *Lecturer in Spanish.*  
 E. Mayone Dias, Lic. F. G., *Lecturer in Spanish and Portuguese.*  
 Raul N. Gutiérrez, Ed.D., *Lecturer in Spanish.*  
 Isabel L. Herwig, M.A., *Lecturer in Spanish and Portuguese.*  
 Josefina M. Mendez, Ed.D., *Lecturer in Spanish.*  
 Leonidas Morales-Toro, Ph.D., *Lecturer in Spanish.*  
 José M. Cruz Salvadores, *Lecturer in Spanish.*  
 George L. Voyt, J. D., *Lecturer in Spanish.*

## Spanish

### Preparation for the Major

Courses 5, 25, 42, and 44, or their equivalents.

### The Major

Fifteen upper division courses distributed as follows: eight required courses: 100 or 103, 105 or 109, 115 or 118, 120A–120B, 121A–121B and 127; seven elective courses: one in language, one in Spanish literature, one in Spanish American literature, and four selected from other Department offerings not including 160A–160B and 162.

### General College Regulation

No credit will be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

### Honors Program

To qualify for graduation with departmental honors, students must achieve a 3.00 overall grade-point average, and have completed in the Department courses 170A–170B.

### Requirement for Teaching Credentials

Consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

### The Master's Degree

*General Requirements.* See pages 153–154. The Department favors the Comprehensive Examination Plan, but, with departmental approval, the Thesis Plan may be followed. See page 155.

*Departmental Requirements—Comprehensive Examination Plan.* (1) Foreign Language Requirements: a reading knowledge of one other foreign language approved by the graduate adviser. This requirement must be met at least one quarter before the awarding of the degree. (2) Course Requirement: ten courses with a minimum of seven in the 200 series, of which one must be a seminar. With the approval of the graduate adviser, a maximum of two courses may be taken at the graduate level in closely related fields. (3) The Comprehensive Examination: two three-hour written examinations to be given the next-to-the-last week preceding the final examination period of the Fall and Spring quarters. In the first of these examinations the student will be expected to show a general knowledge of the history and structure of the Spanish language and of Spanish and Spanish American literatures. In the second of these examinations the student will be expected to show a thorough acquaintance with the authors, works and movements of either (a) Spanish literature or (b) Spanish American

literature. Reading lists which will constitute the basis for this second examination will be available to the student. Only those students who pass these examinations with distinction will be encouraged to proceed to candidacy for the Ph.D.

*Departmental Requirements—Thesis Plan.*

(1) **Guidance Committee:** the preparation and examination of each candidate will be the responsibility of a guidance committee composed of three members of the Department. The chairman of the committee will be the instructor under whom the candidate proposes to write his thesis. The other two members will be appointed by the chairman of the Department after consultation with the candidate and the chairman of the committee. The committee members shall be appointed to represent three different fields of interest within the Department. No committee shall be appointed before a candidate has completed one full quarter of work in graduate standing, including no less than two courses in the Department, of which at least one must be in the 200 series. (2) **Foreign Language Requirement:** the same as the Comprehensive Examination Plan. (3) **Course Requirement:** nine courses of which a minimum of six must be in the 200 series. With the approval of the guidance committee a maximum of two courses may be taken at the graduate level in closely related fields. (4) **Thesis and Examination:** the subject and general plan of investigation for the thesis must be approved by the department and the instructor concerned before a guidance committee can be appointed. After completion of the thesis, the candidate must pass a three-hour oral examination testing his knowledge of the field of his thesis and his general competence. A reading list which will constitute the basis for part of this examination will be available to the student. Only those students who pass these examinations with distinction will be encouraged to proceed to candidacy for the Ph.D.

**Ph.D. Degree in Hispanic Languages and Literatures**

*General Requirements.* See pages 156-160.

**Guidance Committee:** normally in the fifth quarter of graduate studies a guidance committee will be appointed, composed of five members of the Department, to assist the doctoral candidate in planning his program. The chairman of the committee will be the instructor under whom the student proposes to write his dissertation. The other four members will each represent a minor field.

Doctoral candidates entering the Department with an M.A. degree (or an equivalent title) from another institution will not be assigned guidance committees until their second quarter of studies in the Department; such assignment will depend upon a positive recommendation by the instructors already familiar with the candidate's work and potential.

*Foreign Language Requirement.* In addition to Spanish and Portuguese, the candidate must have a reading knowledge of at least two other foreign languages to be chosen with the approval of the guidance committee in the light of the candidate's field of specialization. The candidate must pass the test in one of these two languages not later than in the third quarter of graduate studies and the other not later than in the seventh quarter.

*Fields of Specialization.* The Department recognizes the following fields of specialization, from which *one* major and *four* minor fields shall be selected: (a) Medieval and Renaissance Literature; (b) The Golden Age; (c) 18th and 19th Century Spanish Literature; (d) 20th Century Spanish Literature; (e) Colonial and 19th Century Spanish American Literature; (f) 20th Century Spanish American Literature; (g) Luso-Brazilian Literature (h) Spanish and Portuguese Philology and Linguistics; (i) Spanish and Luso-Brazilian Folklore. The field in which the candidate intends to present a dissertation will be designated as his major field. The minimum course requirement for the major field will be determined by the candidate's guidance committee. The minimum course requirement for a minor field is one graduate course (series 200-249) followed by a corresponding seminar (series 253-286) or the equivalent.

*Course Requirements.* Three upper division courses in Luso-Brazilian literature and a minimum, after the B.A., of 18 graduate courses and seminars, including Spanish 200, 201, 203, and one additional graduate course in one of the above fields of specialization not chosen as a major or minor. Those students who choose philology and linguistics as their major fields must also include Portuguese 203, and have a specific knowledge of Classical and Vulgar Latin and of Old French or Old Italian.

*Qualifying Examinations.* The qualifying examinations will be given during the fifth and sixth weeks of the Fall, Winter, and Spring quarters and will consist of: (a) a three-hour written examination in the candi-

date's major fields; (b) four one-hour written examinations in the minor fields; and (c) a two-hour oral examination. The qualifying examinations are normally taken no later than nine quarters after the B.A. and six quarters after receiving the M.A.

*The Dissertation.* The dissertation may be on any subject within the general area of Spanish and Portuguese languages and literatures. After the acceptance of the dissertation in its final form, the candidate is required to pass an oral examination which will cover principally the field within which the dissertation falls. If five years have elapsed since any of the requirements have been taken, these requirements must be revalidated by the department.

#### Lower Division Courses

##### 1. Elementary Spanish.

Meets six hours weekly, including one hour in laboratory. This course corresponds to the first year of high school Spanish. The Staff

##### 16. Reading Course for Graduate Students.

(No credit)

Meets five hours weekly.

The Staff

##### 2. Elementary Spanish.

Meets six hours weekly, including one hour in laboratory. Prerequisite: course 1 or one year of high school Spanish, or equivalent. The Staff

##### 26. Reading Course for Graduate Students.

(No credit)

Meets five hours weekly. Prerequisite: course 1C or equivalent. The Staff

##### 3. Elementary Spanish.

Meets six hours weekly, including one hour in laboratory. Prerequisite: course 2, or two years of high school Spanish, or equivalent. The Staff

##### 4. Intermediate Spanish.

Meets six hours weekly, including one hour in laboratory. Prerequisite: course 3, or three years of high school Spanish, or equivalent. The Staff

##### 5. Intermediate Spanish.

Meets six hours weekly, including one hour in laboratory. Prerequisite: course 4 or four years of high school Spanish, or equivalent. The Staff

##### 8A-8B. Spanish Conversation. (½ course each)

Beginning each quarter. Meets three hours weekly. Prerequisite: course 8A is open to those who have completed course 4, or equivalent. Students who have completed course 3 with grade B or better may be admitted. The Staff

##### 9A-9B. Advanced Conversation. (½ course each)

Beginning each quarter. Meets three hours weekly. Prerequisite: course 8B or equivalent. The Staff

##### 25. Advanced Spanish.

(Formerly numbered 25A-25B.) Prerequisite: course 5 or equivalent. Concentration on the building of vocabulary and the attainment of a high degree of comprehension in preparation for the courses in literature. The Staff

##### 42. Civilization of Spain and Portugal.

(Same as Portuguese 42.) A background course for the study of Peninsular literature.

Mr. Cruz-Salvadores

##### 44. Civilization of Spanish America and Brazil.

(Same as Portuguese 44.) A background course for the study of Spanish American and Brazilian literatures. Mrs. Arora

#### Upper Division Courses

The basic prerequisite to all upper division courses except 160A-160B and 162 is Spanish 25 or the equivalent.

##### 100. Phonetics and Phonemics.

(Formerly numbered 117.) Meets four hours weekly, including one hour laboratory. Analysis of the phonetic and phonemic systems of Spanish with special emphasis on the correlation between the phonemic and graphemic systems. Exercises and drills directed toward individual needs.

Mr. Cruz-Salvadores, Mr. Otero

##### 103. Morphology and Syntax.

(Formerly numbered 100.) A review of the patterns of the Spanish language: the verb system, syntax of preposition, word structure and word distribution.

Mr. Frey, Mr. Otero

##### 105. Intermediate Composition.

(Formerly numbered 101.) Concentration on idiomatic expressions, paraphrasing, summarizing, and transformational systems. Mr. Gutiérrez, Mr. Voyt

##### 109. Advanced Composition.

(Formerly numbered 114.) Correction of student's original compositions and analysis of basic stylistic elements. Mrs. Baños, Mr. Cortés

##### 115. Applied Linguistics.

Meets three hours weekly. The formulation of the problems faced by the teacher of Spanish in view of general linguistic theory. Mr. Bull, Mr. Frey

##### 118. History of the Spanish and Portuguese Languages.

(Same as Portuguese 118.) Meets three hours weekly. Major features of the development of the Spanish and Portuguese languages from the origins in Vulgar Latin to modern times. Contributions of other languages to the formation of Spanish and Portuguese. Mr. Dias, Mr. Otero, Mr. Smith

##### 120A-120B. Survey of Spanish Literature.

Beginning each quarter. An introduction to the principal authors, works and movements of Spanish literature. Mr. Araya, Mr. Rudder

##### 121A-121B. Survey of Spanish American Literature.

Beginning each quarter. An introduction to the principal authors, works, and movements of Spanish American literature. Mrs. Arora, Mr. Reeve

**122. Medieval and Renaissance Literature.**

The main genres of Medieval and Renaissance Spanish literature with emphasis on at least one representative work for each.

Mr. Rodríguez-Puértolas

**124. The Golden Age.**

The main genres of the Golden Age with emphasis on at least one representative work for each.

Mr. Johnson

**127. Don Quijote.**

Directed reading and intensive study of the novel.

Mr. Dudley

**128. Neoclassicism and Romanticism in Spain.**

The main manifestations of thought and literature from 1700 to 1850 with emphasis on representative works.

Mr. Benítez

**130. Spanish Literature from 1850 to 1898.**

The development of post-Romantic literature with emphasis on representative works.

Mr. Smith

**132. Spanish Literature in the 20th Century.**

Spanish poetry, theater, essay and novel since 1898 with emphasis on at least one representative work for each genre.

Mr. Benítez

**137. The Literature of Colonial Spanish America.**

A study of the most important authors and movements in the various regions of Spanish America to 1810.

Mrs. Arora, Mr. Fogelquist

**139. 19th Century Spanish American Literature.**

A detailed study of the important writers and movements from 1810 to 1860.

Mrs. Arora

**143. Spanish American Literature in the 20th Century.**

A detailed study of the important writers and movements since 1880.

Mr. Crow

**147. Literary Analysis.**

An introduction to the study of literary devices, figures of speech and the differentiation of literary genres.

Mr. Benítez

**149. Folk Literature of the Hispanic World.**

(Same as Folklore 149.) A study of the history and present dissemination of the main principal forms of folk literature throughout the Hispanic countries.

Mr. Carvalho-Neto, Mr. Robe

**151. Folk Song in Spain and Spanish America.**

(½ course)

(Formerly numbered 108.) Meets three hours weekly. A study of the origins and development of Spanish folk music and of the different types of folk songs and folk poetry peculiar to the various regions of Spain and Spanish America.

Mrs. Méndez

**160A-160B. Hispanic Literatures in Translation.**

(Formerly numbered 150A-150B.) Class readings and analysis of selected works in translation from the literatures of Spain and Portugal (160A-W) and of Spanish America and Brazil (160B-F.)

Mr. Hulet, Mr. Johnson

**162. Cervantes in Translation.**

Class readings and analysis of selections from *Don Quijote* and other major works by Cervantes.

Mr. Starkie

**170A. Honer Course in Spanish.**

Meets three hours weekly. Prerequisite: a minimum of six of the courses required for the major with a 3.25 average. Intensive study of a special topic chosen from a list proposed by the instructor in charge. Discussion, oral and written reports.

Mr. Englekirk

**170B. Honers Course in Spanish.**

Prerequisite: course 170A. No regularly scheduled class meetings. Supervised preparation of an honors essay on a selected special topic.

The Staff

**199. Special Studies. (½ to 1 course)**

Prerequisite: consent of adviser and instructor. A maximum of two full courses may count toward the major.

The Staff

**Graduate Courses****200. Bibliography.**

(Formerly numbered 201A.) Meets three hours weekly. Identification and analysis of bibliographical sources for work by doctoral candidates in their fields of specialization.

Mr. Benítez, Mr. Rodríguez-Puértolas

**201. Literary Criticism.**

(Formerly numbered 201B.) Meets three hours weekly. Definition and discussion of methods of literary criticism.

Mr. Benítez, Mr. Otero, Mr. Machado da Rosa

**203A-203B. The Development of the Portuguese and Spanish Languages.**

Prerequisites: course 118, 100 or consent of instructor. Intensive study of the historical development of the Portuguese and Spanish languages from their origin in spoken Latin.

Mr. Otero

**206. Linguistics.**

Meets three hours weekly. Prerequisite: course 115 or equivalent. A study of theoretical synchronic linguistics as applied to Spanish.

Mr. Bull

**209. Dialectology.**

Meets three hours weekly. Prerequisite: course 100 or 115 or equivalent. The major dialect areas of Peninsular and American Spanish, with the distinguishing features of each. Influence and contribution of cultural and historical features, including indigenous languages, to their formation.

Mr. Robe

**222. Medieval and Renaissance Poetry.**

Meets three hours weekly. Readings and lectures on Spanish poetry from the beginnings to 1550.

Mr. Rodríguez-Puértolas

**223. Medieval and Renaissance Prose.**

Meets three hours weekly. Readings and lectures on Spanish prose from the beginnings to 1550.

Mr. Dudley

**224. The Poetry of the Golden Age.**

Meets three hours weekly. Readings and lectures on the main poets and poetic movements of the Golden Age.

Mr. Johnson

**225. The Drama of the Golden Age.**

Meets three hours weekly. Readings and lectures on the "comedia."

Mr. Barcia

**226. Prose of the Golden Age.**

Meets three hours weekly. Readings and lectures on fictional, didactic, religious, and historical writings.  
Mr. Rodríguez-Puértolas

**227. Cervantes.**

Meets three hours weekly. Readings and lectures on the works of Cervantes.  
Mr. Dudley

**230. Neoclassic and Romantic Poetry and Drama.**

Meets three hours weekly. Readings and lectures on representative works of the two genres for the period.  
Mr. Benítez

**231. The 19th Century Novel.**

Meets three hours weekly. Readings and lectures on the novel of the 19th century.  
Mr. Machado da Rosa

**232. The Generation of 1898.**

Meets three hours weekly. Readings and lectures on representative works of the generation.  
Mr. Barcia

**233. Contemporary Spanish Drama.**

Meets three hours weekly. Readings and lectures on the theater since 1898.  
Mr. Barcia

**234. Contemporary Spanish Poetry.**

Meets three hours weekly. Readings and lectures on poetry since 1898.  
Mr. Barcia

**235. Contemporary Spanish Prose.**

Meets three hours weekly. Readings and lectures on the novel, the short story, and the essay since 1898.  
Mr. Barcia

**237. Chroniclers of the Americas.**

Meets three hours weekly. Readings and lectures on the "Cronistas de Indias."  
Mr. Robe

**239. Neoclassic and Romantic Prose and Poetry in Spanish America.**

Meets three hours weekly. Intensive study of Neoclassicism and Romanticism in Spanish America.  
Mr. Sánchez-Reulet

**240. The Modernist Movement.**

Meets three hours weekly. An intensive study of the important writers of this movement during the period 1880-1916.  
Mr. Englekirk

**243. Contemporary Spanish American Poetry.**

Meets three hours weekly. Intensive study of the important poets of Spanish America since 1916.  
Mr. Fogelquist

**244. Contemporary Spanish American Novel and Short Story.**

Meets three hours weekly. A study of the important novelists and short story writers from Modernism to the present.  
Mr. Crow

**245. Contemporary Spanish American Essay.**

Meets three hours weekly. Intensive study of the important essayists of the 20th century.  
Mr. Sánchez-Reulet

**249. Hispanic Folk Literature.**

(Same as Folklore 249.) Meets three hours weekly. An intensive study of folk literature as represented in a) ballad and poetry; b) narrative and drama; c) speech.  
Mr. Robe

## Seminars

**253. Studies in Galician-Portuguese and Old Spanish.**

Prerequisite: course 203. Problems related to the historical development of Galician-Portuguese and Old Spanish.  
Mr. Otero

**256A-256B. Studies in Linguistics and Dialectology.**

256A. Studies in Linguistics. Prerequisite: course 206.

256B. Studies in Dialectology. Prerequisite: course 209.

Meets two hours weekly. Problems in the analysis and description of the contemporary language. Directed toward independent research.  
Mr. Bull, Mr. Robe

**262A-262B-262C. Studies in Medieval and Renaissance Literature.****262A. Lyric Poetry.**

Meets two hours weekly. Prerequisite: course 222.  
Mr. Rodríguez-Puértolas

**262B. Epic Poetry.**

Meets two hours weekly. Prerequisite: course 222.  
Mr. Rodríguez-Puértolas

**262C. Prose Writers.**

Meets two hours weekly. Prerequisite: course 223.  
Mr. Dudley

**264A-264D. Studies in the Golden Age.****264A. Poetry.**

Meets two hours weekly. Prerequisite: course 224.  
Mr. Johnson

**264B. The "Comedia."**

Meets two hours weekly. Prerequisite: course 225.  
Mr. Barcia

**264C. The Picaresque Novel.**

Meets two hours weekly. Prerequisite: course 226.  
Mr. Rodríguez-Puértolas

**264D. Don Quijote.**

Meets two hours weekly. Prerequisite: course 227.  
Mr. Dudley

**270A-270B. Studies in 18th and 19th Century Spanish Literature.****270A. Poetry and Drama.**

Meets two hours weekly. Prerequisite: course 230.  
Mr. Bénéitez

**270B. The Novel.**

Meets two hours weekly. Prerequisite: course 231.  
Mr. Machado da Rosa

**272A-272D. Studies in 20th Century Spanish Literature.****272A. The Novel.**

Meets two hours weekly. Prerequisite: course 232 or 235.  
Mr. Barcia

**272B. The Theater.**

Meets two hours weekly. Prerequisite: course 233.  
Mr. Barcia

**272C. Poetry.**

Meets two hours weekly. Prerequisite: course 234.  
Mr. Barcia

**272D. The Essay.**

Meets two hours weekly. Prerequisite: course 235.  
Mr. Barcia

**277. Studies in Colonial Spanish American Literature.**

Meets two hours weekly. Prerequisite: course 237.  
Mr. Robe



**278. Studies in 19th Century Spanish American Literature.**

Meets two hours weekly. Prerequisite: course 239.  
Mr. Sánchez-Reulet

**280A-280D. Studies in Contemporary Spanish American Literature.**

**280A. Modernist Poetry.**  
Meets two hours weekly. Prerequisite: course 240.  
Mr. Englekirk

**280B. Post-Modernist Poetry.**  
Meets two hours weekly. Prerequisite: course 243.  
Mr. Fogelquist

**280C. Novel and Short Story.**  
Meets two hours weekly. Prerequisite: course 244.  
Mr. Crow

**280D. The Essay**  
Meets two hours weekly. Prerequisite: course 245.  
Mr. Sánchez-Reulet

**286A-286B-286C. Studies in Hispanic Folk Literature.**

(Same as Folklore 286A-286B-286C.)

**286A. The Romancero.**  
Meets two hours weekly. Prerequisite: course 222.  
Mr. Rodríguez-Puértolas

**286B. Narrative and Drama.**  
Meets two hours weekly. Prerequisite: course 239 or 249.  
Mrs. Arora, Mr. Robe

**286C. Ballad, Poetry and Speech.**  
Meets two hours weekly. Prerequisite: course 249.  
Mr. Robe

**Professional Courses****310. The Teaching of Spanish in the Elementary School.**

Meets three hours weekly. Prerequisite: course 115.  
Mr. Frey

**370. The Teaching of Spanish in the Secondary School.**

Meets three hours weekly. Prerequisite: course 115.  
Mr. Bull

**372. The Language Laboratory. (½ course)**

Meets three hours weekly. Preparation of materials. Equipment, techniques, and problems related to the operation of the language laboratory. Mr. Otero

**Individual Study and Research****596. Directed Individual Study or Research. (1 to 2 courses)**

Prerequisite: approval of graduate advisor and of Chairman of the Department. Study or research in areas or on subjects not offered as regular courses. Work evaluated on letter grade basis. No more than one full course may count toward the M.A. course requirement. Limited to a maximum of two full courses in any graduate program.  
The Staff (F, W, Sp, Sum)

**597. Preparation for Graduate Examinations. (1 to 2 courses)**

Prerequisite: official acceptance of candidacy by the department, and approval of graduate adviser. Individual preparation for the comprehensive exam-

ination for the M.A. degree or the qualifying examinations for the Ph.D. degree. Graded satisfactory/unsatisfactory. May be taken only once for each degree examination. The Staff (F, W, Sp, Sum)

**598. Research for M.A. Thesis. (1 to 2 courses)**

Prerequisite: consent of the guidance committee. Research in preparation of the master's thesis. Graded satisfactory/unsatisfactory. May be repeated once. The Staff (F, W, Sp, Sum)

**599. Research for Ph.D. Dissertation. (1 to 2 courses)**

Prerequisite: restricted to those who have passed the qualifying examinations for the doctor's degree. Research for and preparation of the Ph.D. dissertation. Graded satisfactory/unsatisfactory. Registration limited to three quarters. The Staff (F, W, Sp, Sum)

**Portuguese****Preparation for the Major**

Courses 3, 25, 42 and 44, or their equivalent.

**The Major**

Thirteen upper division courses distributed as follows: Six required courses: 100 or 103, 101A or 101B, 120A-120B, 121A-121B; three elective courses from other Portuguese offerings in the department; four courses selected by the student and approved by the Department, in history, philosophy, or another language or literature, and for which the student has the necessary prerequisites or the equivalent.

**Lower Division Courses****1. Elementary Portuguese.**

Meets six hours weekly, including one hour in laboratory. The Staff (F, W, Sp)

**2. Elementary Portuguese.**

Meets six hours weekly, including one hour in laboratory. Prerequisite: Course 1 or equivalent. The Staff (F, W, Sp)

**3. Intermediate Portuguese.**

Meets six hours weekly, including one hour in laboratory. Prerequisite: Course 2 or equivalent. The Staff (F, W, Sp)

**25. Advanced Portuguese.**

Meets four hours weekly. Prerequisite: Course 3 or equivalent. The Staff (W, Sp)

**42. Civilization of Spain and Portugal.**

(Same as Spanish 42.) A background course for the study of Peninsular literature.

Mr. Cruz-Salvadores

**44. Civilization of Spanish America and Brazil.**

(Same as Spanish 44.) A background course for the study of Spanish American and Brazilian literatures.  
Mrs. Arora

## Upper Division Courses

**100. Phonetics and Phonemics.**

Meets four hours weekly, including one hour in laboratory. Analysis of the phonetic and phonemic systems of Portuguese with special emphasis on the correlation between the phonemic and graphemic systems. Exercises and drills directed toward individual needs. Mr. Dias

**101A. Advanced Reading and Conversation.**

Meets three hours weekly. Reading and discussion of writings by modern Brazilian and Portuguese authors. Mr. Hulet

**101B. Advanced Composition and Style.**

Meets three hours weekly. Correction of student's composition and analysis of basic stylistic elements. Mr. Hulet

**103. Morphology and Syntax.**

Meets four hours weekly. A review of the patterns of the Portuguese language: the verb system, syntax of preposition, word pattern and word distribution. Mr. Dias (W)

**118. History of the Spanish and Portuguese Languages.**

(Same as Spanish 118.) Meets three hours weekly. Major features of the development of the Spanish and Portuguese languages from their origins in Vulgar Latin to modern times. Contributions of other languages to the formation of Spanish and Portuguese. Mr. Dias, Mr. Otero, Mr. Smith (F, W, Sp)

**120A. Survey of Portuguese Literature.**

Meets four hours weekly. First half of an introduction to the principal movements, authors, and works of Portuguese Literature. Mr. Dias (F)

**120B. Survey of Portuguese Literature.**

Meets four hours weekly. Second half of an introduction to the principal movements, authors, and works of Portuguese Literature. Mr. Machado (W)

**121A. Survey of Brazilian Literature.**

Meets four hours weekly. First half of an introduction to the principal movements, authors and works of Brazilian Literature. Mr. Hulet

**121B. Survey of Brazilian Literature.**

Meets four hours weekly. Second half of an introduction to the principal movements, authors, and works of Brazilian Literature. Mr. Hulet (W)

**130. The Portuguese Novel.**

Meets four hours weekly. A study of the most representative currents, authors, and works of Portuguese fiction. Mr. Machado da Rosa (F)

**131. The Brazilian Novel.**

Meets four hours weekly. A study of the most representative currents, authors, and works of Brazilian fiction. Mr. Hulet (Sp)

**132. Portuguese Poetry.**

Meets four hours weekly. A study of the most representative currents, authors, and works of Portuguese poetry from the Middle Ages to the present. Mr. Dias (W)

**133. Brazilian Poetry.**

Meets four hours weekly. A study of the most representative currents, authors, and works of Brazilian poetry from Colonial times to the present. Mr. Hulet

**199. Special Studies. (½ to 1 course)**

Prerequisites: consent of advisor and instructor. A maximum of two full courses may count toward the major. The Staff

## Graduate Courses

**203A-203B. The Development of the Portuguese and Spanish Languages.**

Prerequisite: courses 100 and 118 or consent of instructor. Intensive study of the historical development of the Portuguese and Spanish languages from their origin in spoken Latin. Mr. Otero

**222. Camões.**

Meets three hours weekly. An intensive study of the works of Camões, especially the Lusíads and the lyric poetry. Mr. Machado da Rosa (F)

**235. Modern Portuguese Novel.**

Meets three hours weekly. Reading and discussion of the outstanding novels of the XIXth and XXth Century with emphasis on *Eça de Queiroz*. Mr. Machado da Rosa

**236. Modern Brazilian Novel.**

Meets three hours weekly. Reading and discussion of the outstanding novels of the XIXth and XXth centuries with emphasis on Machado de Assis. Mr. Hulet (F)

**253A-253B. Studies in Luso-Brazilian Literature.****253A. Portuguese Authors.**

Meets two hours weekly. Prerequisite: course 222 or 235. Study of outstanding Portuguese authors with emphasis on their relationships to other literatures. Mr. Machado da Rosa

**253B. Brazilian Authors.**

Meets two hours weekly. Prerequisite: course 236. Study of outstanding Brazilian authors with emphasis on their relationships to other literatures. Mr. Hulet

**370. The Teaching of Portuguese in the Secondary School.**

For future teachers in this field. Mr. Hulet

## Individual Study and Research

**596. Directed Individual Study or Research.**

(1 to 2 courses)

Prerequisite: approval of graduate advisor and of Chairman of the Department. Study or research in areas or on subjects not offered as regular courses. Work evaluated on letter grade basis. No more than two full courses may count toward the M.A. course requirement. Limited to a maximum of three full courses in any graduate program. The Staff (F, W, Sp, Sum)

**597. Preparation for Graduate Examination.**

(1 to 2 courses)

Prerequisite: official acceptance of candidacy by the department, and approval of graduate advisor. Individual preparation for the comprehensive examination for the M.A. degree. Graded satisfactory/unsatisfactory. May be taken only once. The Staff (F, W, Sp, Sum)

**598. Research for M.A. Thesis. (1 to 2 courses)**

Prerequisite: consent of the guidance committee. Research in preparation of the master's thesis. Graded satisfactory/unsatisfactory. May be repeated once. The Staff (F, W, Sp, Sum)

## ■ SPEECH

(Department Office, 4303 Humanities Building)

Charles Wyatt Lomas, Ph.D., *Professor of Speech.*

Waldo Woodson Phelps, Ph.D., *Professor of Speech (Chairman of Department).*

Donald Erwin Hargis, Ph.D., *Associate Professor of Speech.*

Ralph Richardson, Ph.D., *Associate Professor of Speech.*

Daniel Vandraegen, Ph.D., *Associate Professor of Speech.*

Dale Gordon Leathers, Ph.D., *Assistant Professor of Speech.*

Prentice Avery Meador, Jr., Ph.D., *Assistant Professor of Speech.*

Paul Irwin Rosenthal, Ph.D., *Assistant Professor of Speech (Vice-Chairman of Department).*

Ned Alan Shearer, Ph.D., *Assistant Professor of Speech.*

Andrea Louise Rich, Ph.D., *Assistant Professor of Speech.*

Arthur Lee Smith, Ph.D., *Assistant Professor of Speech.*



Victoria Alexandria Fromkin, Ph.D., *Assistant Professor of Linguistics.*

Patricia Bellamy Long, M.A., *Lecturer in Speech.*

The major in speech studies the process of verbal communication from the formation and perception of speech sounds to the development of complex ideas intended to influence attitudes, beliefs, and actions of others. Lower division courses are designed to provide the student with the basic information and skills relevant to oral communication. Upper division courses are designed to provide students with an understanding of the theory and to develop critical skills. The major provides for both breadth and depth. All students are required to study the communication process both in terms of scientific knowledge and in terms of its significance as a social tool. In addition, each student emphasizes one of the two aspects included in the discipline, and supplements this emphasis with courses in allied disciplines.

### Preparation for the Major

Speech 1, 2 (lower division); or 101 (upper division), with an average grade of C or higher. Students should note that upper division courses in the allied fields used to complete requirements for the major may have prerequisites. In some cases, these may be combined with the breadth requirements of the College of Letters and Science.

### The Major

In Speech: Ten upper division courses, including: 102, 103 or 104, 107, 111, and 133; three additional courses from the group selected for specialization; and two electives.

*Group I. Rhetorical Criticism and Public Address:* nature of criticism, uses of criticism in evaluating speeches as instruments of decision making in an historical setting, history of public address. 134, 135A, 135B, 137A, 137B, 138.

*Group II. Persuasion and the Group Process:* logical structure of discourse, interaction of audience and speaker, group interaction, decision making through debate and discussion. 106, 108, 109.

In Allied Fields. Six upper division courses in allied fields related to the above group specialization selected from the following lists in consultation with the departmental adviser.

*Group I. Rhetorical Criticism and Public Address:* English 103, 116, 140, any course from 153, 154, 155, 160, 161, 163, 165, 170, 171, 172, 174; History, any course from 150A-150H, 171A through 188; Political Science 141, 142, 145, 152, 172A, 172B, 180; Psychology 135, 136, 137A, 137B; Sociology 122, 150, 152, 155; Journalism 183, 191.

*Group II. Persuasion and the Group Process:* Linguistics 100; Philosophy 192; Political Science 141, 146, 172A, 172B; Psychology 135, 137A, 137B, 149; Sociology 122, 148, 150, 152, 154; Journalism 183, 191.

The following additional courses, ordinarily taken in the graduate year, complete the speech requirement for the general secondary credential: Speech 370 and three upper division or graduate courses in Speech.

The minor in speech for the general elementary credential will consist of the following courses: Speech 1 and 2, or 101; 103 or 104; 106; 111; two courses from Speech 102, 107, 112A, or 112B.

The minor in speech for the general secondary credential will consist of the following courses: Speech 1 and 2, or 101; 102; 106; 111; two courses from Speech 103 or 104, 107, 112A, 112B, 133, 190A-190B; Speech 370.

The minor in speech for the junior college credential will consist of the following courses: Speech 1 and 2, or 101; 102; 106; 111; 133; 370; one upper division elective.

#### The Honors Program

Majors are admitted to candidacy in the honors program in Speech provided that they have a 3.0 overall grade point average. Candidates for honors must take one course 197 in either their junior or senior year, in addition to requirements for the major. Each candidate must also enroll in course 199H for a minimum of two quarters (eight units) during his senior year in which he will prepare an honors thesis. Upon graduation, a candidate will be awarded departmental honors if he 1) has successfully completed the above requisites, 2) has an overall grade point average of 3.0, and 3) has completed all upper division courses in Speech with a grade point average of 3.5 or better.

#### Requirements for Admission to Graduate Courses

A bachelor's degree with a major consisting of at least nine upper division quarter courses (or equivalent) in speech. With departmental approval, up to three courses in closely related disciplines may be accepted in lieu of speech courses. This requirement is prerequisite to the nine-course program for the master's degree. If the candidate is deficient in the prerequisite, he must fulfill it by work undertaken as a graduate student. Graduate students in other disciplines may be admitted to graduate speech courses by permission of the instructor.

#### Requirements for the Master's Degree

For the general requirements, see pages 153-154. The Department follows the Comprehensive Examination Plan, as described on page 155.

The departmental requirements are as follows: (a) In either upper division or graduate status, the program must include the following courses or their equivalents: two courses from each of the following groups: (1) courses 106, 107, 108, 109; (2) courses

133, 134, 135A, 135B, 137A, 137B, 138; and one course from each of the following groups: (1) courses 102, 103 or 104; (2) courses 111, 112A, 112B, (b) Speech 200, Speech 238, one course from the following group: 202, 206, 207, and two courses from the following group: 211, 234, 235, 236, 237, 241. (c) Four elective courses in speech, either graduate or upper division. (d) The student must pass a comprehensive written examination normally given toward the end of each quarter.

#### Requirements for the Doctor's Degree

For the general Graduate Division requirements, see pages 156-160.

Departmental requirements: (a) the Department requires a reading knowledge of one foreign language for the doctoral degree. In consultation with the student, the Department will select the language best suited to his needs; preparation for the language examination begins upon entry into the program. No student will be permitted to take Part II of the qualifying examination until the language requirement has been completed. (b) The qualifying examinations for the Ph.D. are in two parts, each of which consists of written and oral sections. Part I is normally taken after one year of full time graduate work, and Part II after a second year. The written portion of Part I is the same as the comprehensive examination for the master's degree, and students taking that degree from this University will have completed this requirement. Students transferring here with a master's degree from another university will normally take this written examination at the end of the first quarter of residence, provided they have completed a program roughly equivalent to that required for the M.A. degree at UCLA. Students who have shown promise of superior achievement on the written qualifying examinations will be permitted to take the Part I oral qualifying examination before a departmental committee. If they do well in this, they will be encouraged to proceed with further graduate study. (c) Beyond the minimum requirements for the UCLA master's program (see above), the candidate for the Ph.D. must complete the following courses: not less than six graduate courses in speech, including at least two seminars; special reading programs and additional courses as needed to prepare for research in his chosen area; at least five courses in fields other than speech, and related to the area of the proposed dissertation. Following the completion of this program he will take

Part II of the qualifying examinations, and then may be advanced to candidacy. The written portion of Part II will consist of two five-hour examinations in the major speech area (one covering that area generally and the other related specifically to the student's specialization within the major area). The oral portion of Part II will be a two-hour oral examination, before an interdepartmental committee, in the candidate's special field and such areas as are chosen in consultation with the adviser. (d) A final year will normally be devoted by the candidate chiefly to the preparation of his dissertation, after which he will take his final oral examination, a defense of his dissertation.

If a student has allowed seven years or more to elapse since taking a course or examination to meet the requirements for a graduate degree, it will be necessary to have such course or examination validated by the Department before he can proceed toward completion of the requirements.

#### Lower Division Courses

### 1. Principles of Oral Communication.

Prerequisite: Subject A. Theory and practice of informal public speaking, including selection of content, organization of ideas, language and delivery; practice in extemporaneous and manuscript speaking; training in critical analysis through reading and listening to contemporary speeches. **The Staff**

### 2. Public Speaking and Discussion.

Prerequisite: course 1. A continuation of course 1, with special emphasis on group discussions, panels, symposia, debates, and formal public speaking. Critical analysis of speeches in both contemporary and historical settings. **The Staff**

#### Upper Division Courses

### 101. Introduction to Public Address.

Analysis of rhetorical principles. Application to informative and persuasive speaking, to problem-solving discussion, and to the criticism of contemporary speeches. Open to upper division students who do not have credit for Speech 1 and 2. May not be counted as part of upper division major. **The Staff**

### 102. Background and Theories of Oral Communication.

The fundamental nature of oral communication; its rhetorical, linguistic, psychological, and social bases. **Mr. Leathers, Mrs. Rich**

### 103. Phonetics of English.

A study of the physical production and acoustic characteristics of the sounds of American English. **Mrs. Fromkin**

### 104. Science of Speech.

Prerequisite: Linguistics 100. An introduction to the anatomy and neuro-physiology of the speech organs in relation to the acoustic characteristics of the speech signal. **Mrs. Fromkin**

### 106. Principles and Types of Public Discussion.

Analysis of the purposes, principles, and types of public discussion. Practice in organizing group discussion. **Mr. Leathers, Mrs. Rich**

### 107. Principles of Argumentation.

Analysis of propositions, tests of evidence, briefing. Study of hindrances to clear thinking, ambiguity of terms, and prejudices. The critical analysis of selected argumentative speeches. **Mrs. Long, Mr. Rosenthal**

### 108. The Deliberative Process.

The nature and function of deliberative speaking in public meetings and parliamentary bodies. Rules of parliamentary speaking. Parliamentary debate on public issues. Critical analysis of selected speeches. **Mr. Shearer**

### 109. Principles of Audience Analysis.

Theory of audience analysis and adaptation. Preparation and delivery of the occasional speech. **Mr. Phelps, Mr. Shearer**

### 111. The Oral Tradition in Literature.

Historical and theoretical foundations of oral interpretation from the rhapsodists of ancient Greece to contemporary poets and their interpreters. **Mr. Hargis, Mr. Vandraegen**

### 112A-112B. Oral Interpretation of Literature.

A study of the literary, aesthetic, and oral bases for the analysis of communication of (112A.) prose and (112B.) poetry. **Mr. Hargis, Mr. Vandraegen**

### 133. Introduction to Rhetorical Criticism.

Analysis and evaluation of speeches in their social settings; critical studies of invention, arrangement, and style, papers and oral reports. **Mr. Lomas, Mr. Rosenthal**

### 134. Classical Public Address.

A critical study of speeches by leading Greek and Roman orators. **Mr. Meador**

### 135A. British Public Address to 1900.

Critical study of speeches by leading British orators from the earliest times to 1900. Relationships of speakers to issues and social movements of their day. **Mr. Lomas in charge**

### 135B. British Public Address in the 20th Century.

Critical study of speeches by leading British orators from 1900 to the present. Relationships of speakers to issues and social movements of their day. **Mr. Lomas in charge**

### 137A-137B. American Public Address.

Critical study of speeches by leading American orators. Relationships of speakers to issues and social movements of their day. **Mr. Lomas in charge**

137A. Colonial period to 1865; 137B. 1865-1930.

**Mr. Richardson**

### 138. Contemporary American Public Address.

Critical study of American oratory from 1930 to the present with emphasis upon movements and issues such as the Depression, World War II, Civil Rights, and the Cold War, etc. Selected foreign speakers are studied insofar as they affect American issues. **Mr. Phelps, Mr. Shearer**

**141. The Rhetoric of Black America.**

A biographical, textual and critical study of Afro-American speakers and movements from 1797 to the present.  
Mr. Smith in charge

**143. Preaching in Contemporary Society.**

An analysis of preaching, dialogue, and discussion as contemporary oral communication phenomena involving interaction between the pulpit and the pew. Lectures, discussions, oral reports, and papers.  
Mr. Meador in charge

**144. Speech and Community Action.**

Consent of instructor required. An intensive laboratory-based, observation-oriented study of speech and communication practices of action groups, protest groups, and public officials involved with the metropolitan Los Angeles urban crises.  
Mr. Richardson in charge

**150. Interracial Communication.**

The application of the principles of communication theory to the diagnosis of face-to-face interracial communication problems. Small, interracial discussion groups create a laboratory environment in which the class participates in, observes, and analyzes interracial communication.  
Mrs. Rich, Mr. Smith

**151. Patterns in Black Communication.**

This course focuses on the African and American backgrounds of black communicative behavior; special attention is given to the oral tradition, development of black public speaking, and the audience-speaker interaction in secular and religious situations.  
Mr. Smith

**160. Freedom of Speech.**

A course designed to explore the policies behind and scope of the constitutional guarantees of freedom of speech. Emphasis will be placed on the legal limits of the use of verbal communication in contemporary society.  
Mrs. Long, Mr. Rosenthal

**170. Rhetoric of Winston Churchill.**

An intensive study of the speeches of Winston Churchill during the wilderness years—the 30's—and during the wartime years. The background and the impact of these speeches also are examined.  
Mr. Phelps, Mr. Shearer

**175. The Speeches of Abraham Lincoln.**

Students will be introduced to the full span of Lincoln's speaking career. His methods of preparation, the influence of associates, his style, his delivery, and lastly, his effect upon the nation will be studied.  
Mr. Richardson

**190A-190B. Forensics. (½ course each)**

Prerequisite: consent of the instructor. May be repeated once for credit.  
Mrs. Long

**191. Analysis and Briefing. (½ course)**

Prerequisite: consent of the instructor. Intensive study of selected political or social issues; preparation of bibliography; analysis and evaluation of issues and arguments.  
Mrs. Long

**197. Preseminar in Rhetoric.**

Intensive study of the speaking associated with a single major issue. Lectures, discussions, oral reports, and papers. Limited to seniors and graduate students with credit for at least three upper division courses in speech, including at least one course in the history and criticism of public address. The Staff

**199. Special Studies. (½ to 1 course)**

Prerequisite: senior standing and consent of instructor.  
The Staff

**199H. Special Studies for Honors Candidates.**

Prerequisite: admission to Honors Program and senior standing.

**Graduate Courses****200. Bibliography and Methods of Research.**

Mr. Shearer

**201. Rhetorical Criticism.**

Survey and analysis of the theoretical foundations of rhetorical criticism. Mr. Rosenthal, Mr. Shearer

**202. Theory Testing in Human Communication.**

Mr. Leathers

**206. Theory of Small Group Communication.**

A systematic study of the distinctive properties of small group communication. Involves analysis of those factors which materially affect the quality of group communication. Attempts to expand the existing theoretical framework which is applicable to the small group.  
Mrs. Rich, Mr. Leathers

**207. Theory of Persuasive Communication.**

The dynamics of communication designed to influence human conduct; analysis of the structure of persuasive discourse; integration of theoretical materials drawn from relevant disciplines of the humanities and social sciences.  
Mrs. Rosenthal

**220. Problems in Interracial Communication.**

Consideration of selected topics from the theoretical and research literature of interracial communication. Analysis of basic communication problems within a multi-racial society; critique of research findings and methodologies.  
Mrs. Rich, Mr. Smith

**234. Classical Rhetorical Theory.**

Mr. Meador

**235. Medieval Rhetorical Theory.**

Mr. Meador

**236. Renaissance and Early Modern Rhetorical Theory: 1500-1850.**

Mr. Shearer

**237. Modern Rhetorical Theory: 1850 to the Present.**

Mr. Phelps, Mrs. Rich

**238. Theory of Delivery.**

A historical survey of delivery as a rhetorical cannon.  
Mr. Hargis, Mr. Vandraegen

**239. Elocution and Rhetorical Theory: 1750-1920.**

Critical investigation of the genesis, ascendancy, and decline of elocutionary theory and practice and relation to rhetorical theory from 1750-1920.  
Mr. Hargis

**241. Agitation as a Form of Public Address.**

Theory of agitation; its relation to free speech and democratic decision making; values and dangers of agitational oratory. Intensive study of selected agitational speakers and movements.

**247. Legal Argumentation.**

Theory of persuasive communication in the legal milieu; analysis of the nature and structure of legal discourse and the characteristics of the legal audience.  
Mr. Rosenthal

**260A-260B. Seminar in the Criticism of Public Address.**

260A. Historical and Social Settings. Mr. Lomas  
260B. Rhetorical Criticism. Mr. Lomas

**266. Seminar in Critical Analysis of Discussion.**  
Mr. Leathers

**267. Seminar in Critical Analysis of Argumentation.**  
Mr. Rosenthal

**268. Seminar in Rhetorical Theory.**  
Mr. Meador, Mr. Shearer

**270A. Field Studies of Speech and Communication Practices of Protest Groups, Protest Leaders, and Public Agencies Involved in the Los Angeles Urban Crises.**

Mr. Richardson

Professional Course in Methods

**370. The Teaching of Speech.**

Required of candidates for the general secondary credential with the major or minor in speech.

Mr. Phelps, Mrs. Rich

**495. Teaching Rhetoric in Colleges and Universities.**

Study of problems and methodologies associated with teaching rhetorical communication. Includes observation of selected classroom situations.

Mr. Phelps

Individual Study and Research

**596. Directed Individual Study or Research.**

(½ to 1 course)

The Staff

**596X. Directed Individual Study or Research.**

(½ to 1 course)

Preparation for language examination. The Staff

**597. Preparation for the Comprehensive Examination for the Master's Degree or for the Qualifying Examination for the Ph.D.**  
(½ to 1 course)

The Staff

**599. Research for and Preparation of the Doctoral Dissertation. (¼ to 2 courses)**

The Staff

■ **STATISTICS**

Studies in statistics and related areas are possible in various academic departments. Detailed information may be found in the announcements of the individual departments listed below.

■ **SUBJECT A: ENGLISH COMPOSITION**

(Department Office, 306 Royce Hall)

———, *Professor of English.*

Everett L. Jones, M.A., *Supervisor of Instruction in Subject A.*

Cathleen H. Wheat, Ph.D., *Lecturer in Subject A.*

**Anthropology**

Course in statistical methods.

**Biomathematics**

Stochastic models in biology.

**Business Administration**

Master of Science and Ph.D. degree programs with specialization in business statistics offered by the Quantitative Methods Division.

**Economics**

Upper division and graduate offerings in econometrics.

**Education**

Graduate offerings in experimental design and in measurement.

**Engineering**

Upper division and graduate offerings in statistics and probability.

**Mathematics**

Probability and statistics available as a field in the Ph.D. program in mathematics and the applied mathematics program.

**Pharmacology**

Bioassay.

**Political Science**

Upper division course in quantitative methods.

**Psychology**

Course work in statistics, factor analysis, scaling.

**Public Health**

Master of Science and Ph.D. programs in biostatistics.

**Sociology**

Offerings in statistics, measurement, demography.

**Subject A. (No credit)**

Fee, \$45.00. Four hours weekly for one quarter. Although this course yields no credit, it displaces 4 units on the student's program. Every student who does not satisfy the Subject A requirement by presenting transfer credit or by passing an acceptable examination is required to take, in the quarter im-

mediately following his admission to the University, the course in Subject A. Sections are limited to thirty students. For further details, see page 38 of this bulletin. Training in correct writing, including drill in sentence and paragraph construction, diction, punctuation, usage, and spelling. Weekly compositions and written tests on the text. The Staff

**THEATER ARTS**

(Department Office, 2310 Macgowan Hall)

Walden P. Boyle, Ph.D., *Professor of Theater Arts (Vice-Chairman of the Department).*

Arthur B. Friedman, Ph.D., *Professor of Theater Arts.*

Henry Goodman, Ph.D., *Professor of Theater Arts.*

Edward Hearn, M.A., *Professor of Theater Arts.*

John H. Jones, M.A., *Professor of Theater Arts.*

Walter K. Kingson, Ed.D., *Professor of Theater Arts.*

George M. Savage, Ph.D., *Professor of Theater Arts.*

Ralph Freud, *Emeritus Professor of Theater Arts.*

§Hugh J. Gray, Ph.D., *Emeritus Professor of Theater Arts.*

William W. Melnitz, Ph.D., *Emeritus Professor of Theater Arts.*

Samuel Selden, Litt.D., *Emeritus Professor of Theater Arts.*

William B. Adams, M.A., *Associate Professor of Theater Arts.*

Robert F. Corrigan, M.A., *Associate Professor of Theater Arts.*

Richard C. Hawkins, M.A., *Associate Professor of Theater Arts.*

Melvyn B. Helstien, Ph.D., *Associate Professor of Theater Arts.*

Robert H. Hethmon, Ph.D., *Associate Professor of Theater Arts.*

James Kerans, Ph.D., *Associate Professor of Theater Arts.*

Darrell E. Ross, M.F.A., *Associate Professor of Theater Arts.*

Louis C. Stoumen, B.A., *Associate Professor of Theater Arts.*

Abe V. Wollock, Ph.D., *Associate Professor of Theater Arts.*

John R. Cauble, M.A., *Assistant Professor of Theater Arts.*

Donald B. Crabs, M.A., *Assistant Professor of Theater Arts.*

William E. Crocken, *Assistant Professor of Theater Arts.*

Frank D. LaTourette, M.Litt., *Assistant Professor of Theater Arts.*

Mark McCarty, M.A., *Assistant Professor of Theater Arts.*

William H. Menger, M.A., *Assistant Professor of Theater Arts.*

Carl R. Mueller, Ph.D., *Assistant Professor of Theater Arts.*

Howard Suber, Ph.D., *Assistant Professor of Theater Arts.*

Elyseo J. Taylor, B.A., *Assistant Professor of Theater Arts.*

Larry Thor, *Assistant Professor of Theater Arts.*

\_\_\_\_\_, *Assistant Professor of Theater Arts.*



John D. Boehm, M.A., *Lecturer in Theater Arts.*

Edgar Brokaw, B.A., *Lecturer in Theater Arts.*

Robert F. Epstein, *Lecturer in Theater Arts.*

David L. Fagen, Ph.D., *Lecturer in Theater Arts.*

Burdette Fitzgerald, M.A., *Lecturer in Theater Arts.*

Hugh Grauel, M.A., *Lecturer in Theater Arts.*

Patricia Hungerland, M.A., *Lecturer in Theater Arts.*

John Ingle, M.A., *Lecturer in Theater Arts.*

Ruth C. Lane, *Lecturer in Theater Arts.*

T. Roger MacDougall, B.L., *Acting Professor of Theater Arts.*

§ Recalled to active service.



Paul A. Magistretti, M.A., *Acting Assistant Professor of Theater Arts.*  
 Edward Kaye-Martin, *Lecturer in Theater Arts.*  
 Delia N. Salvi, Ph.D., *Lecturer in Theater Arts.*  
 Ralph Sargent, M.A., *Lecturer in Theater Arts.*  
 J. Palmer Schoppe, *Lecturer in Theater Arts.*  
 Ruth E. Schwartz, Ph.D., *Lecturer in Theater Arts.*  
 Donald S. Skoller, Ph.D., *Acting Associate Professor of Theater Arts.*  
 Lyne S. Trimble, M.S., *Lecturer in Theater Arts.*  
 William D. Ward, M.F.A., *Lecturer in Theater Arts.*  
 John W. Young, M.S., *Lecturer in Theater Arts.*

The Department of Theater Arts bases its work in theater, motion pictures, television, and radio on a solid foundation in the liberal arts. The purpose of the curriculum is to develop in its students a scholarly, creative and professional approach to the theater arts. The aim of the Department is to train graduates who will eventually make original contributions in the field of their work.

The student majoring in theater arts must complete the requirements of the College of Fine Arts (see pages 90-93), and the requirements under one of the three specializations: theater, secondary teaching credential, motion picture-television/radio.

#### Preparation for the Major

**Theater Specialization.** Courses 5A-5B (5A must be taken before 5B)-5C, 20A, 40, 41, 42.

**Secondary Teaching Credential Specialization.** Courses 5A-5B-5C, 20A, 40, 41, 42, and Humanities 1A-1B, or English 10A-10B.

**Motion Picture-Television/Radio Specialization.** Courses 5B and 5C. Students electing to specialize in motion picture-television/radio for their B.A. degrees must complete the general University and College Requirements before entering the program.

#### The Major

**Theater Specialization.** Courses 105, 130A, 140A, 141A, 142A, 143A, 160A, 170, 172A-172B, Classics 142, English 103, 167 and five courses or 20 units of approved electives in theater arts, for a total of 15½ courses or 62 units. All students during each quarter of residence are responsible for completing specific production assignments related to production activity of the Theater Division.

**Special Programs in Theater.** In addition to the standard major, the Theater Division provides for two special programs: 1) Acting; 2) Playwriting. Other programs, such as Design/Technical, can be arranged with the proper adviser. Students intending to follow

one of these programs must follow the usual preparation for the major.

**Special Program in Acting.** A two-year program beginning in the junior year, consisting of at least 15½ courses or 62 units. For details see the program adviser.

**Special Program in Playwriting.** Courses 105, 106A, 130A, 130B, 130C, 130D, 160A, 170, 172A, 172B, Classics 142, English 103, English 167 and 3½ additional courses, selected with the student's adviser, for a total of 15½ courses or 62 units.

Admission to any of the special or devised programs in Theater is by application to the Head of the Theater Division after consultation with the teaching faculty of the area chosen. Continuance in the programs is by consent of the faculty, subject to periodic review.

**Secondary Teaching Credential Specialization.** Courses 105, 130A, 140A, 141A, 142A, 143A, 160A, 160B, or 161, 170, 172A, 172B, 370, Classics 142, English 103, English 167 and Theater Arts electives to bring unit total to 62. In addition to the above program, the student must interview a credential adviser in the Graduate School of Education concerning required courses in education, a teaching minor and the year of graduate study.

**Motion Picture-Television/Radio Specialization.** Admission to this specialization is not automatic. Applicants must obtain departmental permission by 1) filing a letter of intention, 2) showing evidence of having completed the general university and college requirements by providing a complete transcript, and 3) giving evidence of creative ability.

All students in motion picture-television/radio will begin the general major in their junior year, and during that year they take the following courses: 134 (double course), 179A (double course), three courses selected from 106A, 106B, 108, 110 and two upper division courses chosen from the history, theory and criticism course listings in Theater Arts.

At the end of the junior year, students will be evaluated on their year's work. A certain proportion will be selected for special programs in motion pictures or television/radio or critical studies or a combined program. The students who are not selected for the Senior Year Special Programs, and those who wish a General Major, will continue into the second part of the General Major; others may wish to change majors. All students who continue in the General Major will complete the following courses: 195 or 196 and five courses (excluding those already applied to the requirements of the General Major during the Junior Year) from 102A, 102B, 102D, 104, 106A, 106B, 107, 108, 110, 111, 112, 113, 114, 116 and 198 (no more than two courses in the 198 series may be counted).

*Special Program in Film Making.* Courses 179B (four courses) or 181A, 181B and 181C, and courses chosen from 132, 133, 138, 151, 152, 153A, 154 and 164 for a total of at least 10 courses. Students are required to perform assignments on each other's projects.

*Special Program in Writing.* Courses 132, 133, 135A-135B-135C (double courses), or 137A-137B-137C (double courses), 138 and approved Theater Arts electives for a total of at least 10 courses.

*Special Program in Television Production.* Courses 185A-185B-185C (double courses), and courses chosen from 186A-186B-186C or from courses listed above under Film Making for a total of at least 10 courses. Students may be obligated to fulfill specific production assignments as a contribution to the creative program in Television/Radio.

*Special Program in Critical Studies.* Courses 109A-109B-109C and at least seven courses chosen from the history and criticism course listings in Theater Arts. At the adviser's option, a student may take up to three courses of the ten outside the Department, in the general area of critical studies in fine arts or literature.

*Special Combined Studies Program.* Ten courses, drawn from those which satisfy the requirements for the special programs in Film Making or Television listed above, with departmental approval.

*Note:* The Motion Picture-Television/Radio Division, Department of Theater Arts, reserves the right to hold for its own purposes, examples of any work done in classes and to retain for distribution such examples as may be selected.

### Admission to Graduate Status

In addition to meeting the general requirements of the Graduate Division the student will usually be expected to have completed his bachelor's degree in theater arts or its equivalent. Students whose theater arts preparation is deficient as determined by the appropriate admissions committee, will be required to take work additional to the degree program to make up such deficiencies.

The applicant who has done his preparatory work elsewhere must provide the Department with the results of certain diagnostic tests and letters of reference. Further information should be obtained from the Chairman of the Department at least three months prior to the beginning of the quarter in which the student plans to enroll.

A student pursuing an M.A. degree in theater or motion pictures must complete the requirement of one foreign language before advancement to candidacy. There is no language requirement in Television/Radio. In the area of motion picture aesthetics or history, a student must satisfy the faculty that he or she has a reading knowledge of French or Italian during the first quarter of graduate residence.

### Requirements for the Master of Arts Degree

The Department of Theater Arts follows the Thesis Plan. The program requires the completion of a minimum of nine courses and a demonstration of the reading knowledge of a foreign language except in Television-Radio (see above); at least one year (3 quarters) of intensive study and laboratory exercises; and research leading to the completion of a written thesis in the history, aesthetics, criticism or techniques of theater arts. A student in theater and television is required to take an active part in the production program of the Department as partial fulfillment of the degree requirements. In planning his course of study the student will place his emphasis on theater, motion pictures or television.

*Theater.* The required courses are 200, 201, 205A or 205B, 240 and 245A-245B. The student will choose the remaining four courses after being advised. A handbook of regulations for the M.A. in Theater may be obtained from the graduate secretary of the Department.

*Motion Pictures.* Course 200 and four of the following courses are required: 206A, 206C, 208A, 208B, 209A, 209B, 209C, or 291. It is recommended that course 200 be

taken in the quarter preceding advancement to candidacy.

**Television/Radio.** The required courses are 200 and 210. The student will choose the remaining seven courses after consultation with his adviser.

#### Master of Fine Arts Degree

The Department offers a two-year program leading towards an M.F.A. degree in either theater, motion pictures or television/radio. All programs require the completion of 36 units (nine courses). (See below for requirements by subject area.) In addition the student must complete certain projects in writing, direction, acting, design or technical supervision.

For admission to the program a student must have completed the UCLA undergraduate program in theater arts in the area of his proposed specialization, or its equivalent. Candidates for the M.F.A. programs in motion pictures or television/radio must provide a portfolio of creative work. Students with a portfolio may be admitted to the program with deficiencies when an undergraduate degree has been completed in some field other than theater arts, or when an undergraduate degree in theater arts has had different requirements. In such cases the student can anticipate spending some time in limited status while removing the deficiencies.

**Theater.** The Department of Theater Arts follows the Comprehensive Plan for the M.F.A. in theater. The M.F.A. projects may be in writing, direction, theater design, costume design, acting or technical supervision, and a candidate will be advised to arrange a program of about 18 courses which involves him in the successful completion of his project series. A handbook of regulations for the M.F.A. in theater may be obtained from the graduate secretary of the Department.

**Motion Pictures.** The M.F.A. in motion pictures can be taken in either film making or writing. Course requirements will be arranged with a graduate adviser.

1. Film making. The base of this program is a B.A. with successful completion of the animation sequence (181A-181B-181C) or Film Projects 1 and 2 (179A-179B). Course work is intended to provide an opportunity to generalize upon the experience of the undergraduate projects, and to experiment further before embarking on the final film project for the M.F.A.

2. Writing. The base of this program is successful completion of an undergraduate

program in writing (see UCLA requirements under description of undergraduate curriculum). The thesis project will be a feature-length script, or an equivalent amount of writing, in fictional or documentary forms.

**Television.** The M.F.A. in television can be taken in either *production-direction* or *writing*. Course requirements will be arranged with a graduate adviser. Students will be admitted to the M.F.A. Program only after: (1) Completing two quarters of graduate residency and (2) Qualifying for admittance by written application and approval of faculty.

1. Production-Direction. The base of this program is the B.A. in television at UCLA or its equivalent (see undergraduate programs above), and courses 179A, 185A-185B-185C. Students entering television graduate studies from other disciplines or other institutions may be required to take make-up courses in deficient areas. Additional courses will be determined in consultation with a graduate adviser. The end projects at the graduate level will be one or more major productions, demonstrating originality and the creative ability of the student, as well as his professional mastery of the medium.

2. Writing. The base of this program is the successful completion of the writing area concentration for the B.A. at UCLA (see above). Additional courses will be determined in consultation with a graduate adviser. The end project at the graduate level will be one or more original scripts, which may be conceived for fictional, documentary, or educational television.

#### Doctor of Philosophy Degree in Theater History

In addition to the general University regulations for the doctor of philosophy degree, including the dissertation and final examinations (see page 156), a candidate must satisfy the following departmental requirements.

**Foreign language.** A reading knowledge of French and German is required for all candidates. In the case of a student specializing in the theater arts of an area requiring a knowledge of a language other than French or German, he may substitute that language for one of the above. The requirements for the first language must be fulfilled by the end of the first year of graduate work; the requirement for the second language, at the end of the second year.

Both language requirements must be satisfied before advancement to candidacy for the degree.

*Qualifying examination.* Preparation for the qualifying examination, which advances the student to candidacy, will include a minimum of four graduate seminars and other courses required by the student's advisers. In addition he will be required to produce evidence of research and scholarly writing. The examination is both written and oral. A handbook of regulations for the Ph.D. in Theater History may be obtained from the graduate secretary of the Department.

#### Lower Division Courses

#### 5A. History of the Theater from Primitive Times to 1700.

Lecture, three hours; quiz section, one hour. Required of theater arts majors with specialization in theater or secondary teaching credential. The history of the influence of different cultures, traditions, and technologies on the development of theater as a social institution.

#### 5B. History of the Theater from 1700 to the Present.

Lecture, three hours; quiz section, one hour. Required of theater arts majors in all specializations except television. The history of the influence of different cultures, traditions, and technologies on the development of theater as a social institution.

#### 5C. History of Motion Pictures and Broadcasting.

Lecture, four hours; laboratory, two hours. Required of theater arts majors except those in the acting specializations. The history of the development of motion pictures and broadcasting from their beginnings to the present day. Mr. Stoumen

#### 20A. Acting Fundamentals.

Required of theater arts majors with specialization in theater, secondary teaching credential, television-radio. An introduction to the interpretation of drama through the art of the actor. Development of individual insights, skills, and disciplines in the presentation of dramatic material to an audience. Mr. Cauble, Mrs. Fitzgerald

#### 20B. Acting Fundamentals. (½ course)

Lecture-laboratory, four hours. Prerequisite: course 20A or the consent of the instructor. Intensive application of acting techniques through study and performance of selected scenes from stage, motion pictures and television scripts.

#### 20C. Acting Fundamentals. (½ course)

Lecture-laboratory, four hours. Prerequisite: courses 20A-20B, or the consent of the instructor. Study and performance involving problems of style in a wide range of dramatic material.

#### 21A. Intermediate Acting. (½ course)

Lecture-laboratory, four hours; laboratory, three hours. Prerequisites: course 20A or equivalent and consent of the instructor. Intensive application of acting techniques through study and performance and the learning of basic exercises for the actor.

#### 21B. Intermediate Acting. (½ course)

Lecture, four hours; laboratory, three hours. Study and performance involving problems in a wide range of dramatic material.

#### 21C-21D-21E. Intermediate Acting. (½ course each)

Lecture, four hours; laboratory, three hours. Individual studies and exercises designed to develop freedom and imagination in the preparation of dramatic material.

#### 40. Fundamentals of Stage Scenery. (½ course)

Lecture, two hours; laboratory, two hours. (Courses 40, 41, 42 may be taken in any sequence, but not concurrently.) Required of theater arts majors with specialization in theater or general secondary teaching credential. The planning and execution of stage scenery; the consideration of design, materials, construction methods, shop procedures and budgeting. Mr. Crabs

#### 41. Fundamentals of Stage Lighting and Sound. (½ course)

Lecture, two hours; laboratory, two hours. (Courses 40, 41, 42 may be taken in any sequence, but not concurrently.) Required of theater arts majors with specialization in theater or general secondary teaching credential. A basic study of stage lighting with emphasis on the study of instruments, control, color, and procedure. Procedures and techniques related to audio-recording and reproduction for the stage. Mr. Crabs

#### 42. Fundamentals of Stage Costuming. (½ course)

Lecture, two hours; laboratory, two hours. (Courses 40, 41, 42 may be taken in any sequence, but not concurrently.) Required of theater arts majors with specialization in theater or general secondary teaching credential. Costume analysis and construction techniques. Laboratory practice in the making of a costume from design to performance. Mrs. Hungerland

#### 43. Introduction to Basic Principles of Design. (½ course)

Lecture, two hours. Study of the relationship of various elements of total theater design. Required of those specializing in design, technical theater, and playwriting.

#### Upper Division Courses

### THEATER AND GENERAL SECONDARY CREDENTIAL AREAS

#### 101. Introduction to the Theater Arts. (½ course)

Not open for credit to theater arts majors. A survey of theater, motion pictures, television and radio, together with critical analysis of their roles in contemporary culture, leading to an appreciation and understanding of the theater arts. A non-technical presentation for the general student. The Staff

#### 102A. History of the European Theater.

Lecture, three hours. A survey of the development of the theater, with emphasis on the contributions of Europe from the Greeks to the Renaissance, based upon the most authoritative critical studies in the field.

**102B. History of the European Theater.**

Lecture, three hours. Prerequisite: course 102A or consent of the instructor. A survey of the development of the theater, with emphasis on the contributions of Europe from the Renaissance to the twentieth century, based upon the most authoritative studies in the field.

**102D. History of the European Theater.**

Lecture, three hours. Prerequisites: courses 5A and 5B or consent of the instructor. A survey of the development of the theater, from the Greeks to the present day. May not be taken for credit by students who have had 102A or 102B. Mr. Mueller

**104. History of the American Theater.**

Lecture, three hours. The history of the American theater from the Revolutionary War to the present.

**105. Main Currents in Theater.**

Lecture, three hours. Required of theater arts majors with specialization in theater or secondary teaching credential. Critical examination of the leading theories of theater from 1887 to the present. Study and discussion of modern styles of production. Mr. Goodman

**117A. The Puppet Theater. (½ course)**

Lecture, two hours; laboratory, four hours. Prerequisite: course 40 or consent of the instructor. Study of the history and practice of the art of puppetry. An examination of the materials and methods of construction. Staging of puppet and marionette productions as laboratory practice. Mr. Helstien

**117B. The Puppet Theater. (½ course)**

Lecture, two hours; laboratory, four hours. Prerequisite: course 40 or consent of the instructor. Advanced study in the art of puppetry. Mr. Helstien

**117C. The Puppet Theater. (½ course)**

Lecture, two hours; laboratory, four hours. Prerequisite: course 40 or consent of the instructor. Advanced study in the staging of puppet and marionette productions. Mr. Helstien

**118A. Creative Dramatics.**

Studies of the principles and procedures of the informal approach to children's drama through creative interpretations of literature. Mrs. Fitzgerald

**118B. Creative Dramatics. (½ course)**

Lecture, one hour; laboratory, two hours. Prerequisite: course 118A or consent of the instructor. Advanced theory and practice in the art of drama for children. Mrs. Fitzgerald

**119. Theater for the Child Audience.**

Lecture, three hours. Theories and principles of production in the formal theater arts for children. Analysis and evaluation of appropriate theatrical forms. Mr. Helstien

**120A. Advanced Acting for the Stage.**

Prerequisite: course 20A or consent of the instructor. Advanced study and practice in the art of acting.

**120B. Advanced Acting for the Stage.**

Prerequisite: consent of the instructor. Advanced problems in acting for the stage.

**121A-121B-121C. Advanced Problems in Acting.**

Lecture, six hours; laboratory, six hours. Study and development of characters from the classic plays through the body of contemporary literature.

**121D-121E-121F. Advanced Problems in Acting.**

Lecture, six hours; laboratory, six hours. Advanced problems in acting.

**122. Make-up for the Stage. (½ course)**

The art of make-up and its relation to the production as a whole. History, aesthetics, materials, and procedures of make-up. Mr. Jones

**124A-124B. Voice for the Stage. (½ course each)**

Lecture, two hours; laboratory, two hours. Development of the techniques of voice production for the theater.

**130A. Fundamentals of Playwriting I.**

Lecture, three hours. Required of Theater Arts majors with a specialization in theater or secondary teacher's credential. Course designed to stimulate the student's critical and creative faculties through the preparation of original material for the theater. Guidance in the completion of a one-act play. Mr. Savage

**130B. Fundamentals of Playwriting II.**

Lecture, three hours. Prerequisite: course 130A. Study in original material for the theater, its preparation and its development. Course is designed to give further insight into critical aspects of the one-act form. Guidance in the completion of a one-act play. Mr. Savage

**130C. Intermediate Playwriting.**

Lecture, three hours. Prerequisites: courses 130A, 130B, and consent of the instructor. Further study in original material for the theater—its preparation and its development. Discussion and interpretation of the one-act form—its relation to the full-length structure and form. Guidance in completion of original material as deemed appropriate by the instructor. Mr. Savage

**130D. Intermediate Playwriting.**

Lecture, three hours. Prerequisites: courses 130A, 130B, 130C and consent of the instructor. Continued study in original material for the theater. Preparation and development of a play. Guidance in completion of original material. Mr. Magistretti, Mr. Savage

**132. Manuscript Evaluation for Theater.**

Lecture, three hours. Prerequisite: course 130A and consent of the instructor. May be repeated for a maximum of two courses credit. Principles and practices in the evaluation of manuscripts for theater. Mr. Savage

**139. Play Analysis.**

(Formerly course 137.) Lecture, four hours. Theory of action as it relates to drama. Study of the determinants of conflict, motive, and action, and of the critical vocabulary appropriate to such a study.

**140A. Scenic Techniques for the Stage. (½ course)**

Lecture, two hours; laboratory, two hours. Prerequisite: course 40 or approved equivalent. (Courses 140A, 141A, 142A may be taken in any sequence, but not concurrently.) Required of theater arts majors with specialization in theater or secondary teaching credential. An intensive study in the techniques of scenic construction, with emphasis given to dimensional scenic structures. Mr. Crocken

**140B. Advanced Scenery for the Stage.**

Lecture, three hours; laboratory, two hours. Prerequisite: course 140A. Advanced study of technical problems in staging theater productions, including design analysis and planning related to rigging, shifting and construction techniques. Mr. Crocken

**141A. Lighting Techniques for the Stage.****(½ course)**

Lecture, two hours; laboratory, two hours. Prerequisite: course 41 or approved equivalent. (Courses 140A, 141A, 142A may be taken in any sequence, but not concurrently.) Required of theater arts majors with specialization in theater or secondary teaching credential. The study of stage lighting techniques with emphasis given to lighting plots, instrument schedules, hanging sections, and sequential cue relationships. Mr. Crocken

**141B. Advanced Lighting for the Stage.**

Lecture, three hours; laboratory, two hours. Prerequisite: course 141A. The detailed study of stage lighting as an art, with emphasis given to design concepts. The interpretation of a script or score through the control of light and color in relation to actor and audience. Mr. Crocken

**142A. Costuming Techniques for the Stage.****(½ course)**

Lecture, two hours; laboratory, two hours. Prerequisite: course 42 or consent of the instructor. Required of theater arts majors with specialization in theater or secondary teaching credential. Advanced study of historical costume and the interpretation of theatrical costume design through the use of patterns, fabrics, and related costume techniques. Mrs. Hungerland

**142B. Advanced Costuming for the Stage.**

Lecture, two hours; laboratory, three hours. Prerequisite: course 142A or consent of the instructor. Special problems in the procuring, designing, construction and management of costumes used in theatrical productions. Mrs. Hungerland

**143A. Scenic Design for the Theater.**

Lecture, two hours; laboratory, two hours. Prerequisites: courses 40, 41, 42. Required of theater arts majors with specialization in theater or secondary teaching credential. Basic principles of design as applied to the interpretation and presentation of the visual aspects of dramaturgy. Study of styles, techniques and methods of design for the theater arts. The translation of ideas into visual forms. Mr. Jones

**143B. Advanced Scenic Design for the Theater.**

Lecture, two hours; laboratory, two hours. Prerequisites: course 143A and consent of the instructor. Further study of the design of scenery for the theater, and translation of the design into actual visual form. Solving design problems for the complicated play. Consideration of experimental ideas, and the investigation of new materials. Mr. Corrigan

**145. Costume Design for the Theater.**

Prerequisite: course 42 or consent of the instructor. Design of costumes for theatrical presentations. The study of the use of silhouette, fabrics, color, and decoration as related to theatrical characterizations. Mr. Jones

**146A. Drafting for the Theater Arts.**

Lecture, one hour; laboratory, three hours. Prerequisite: course 143A or consent of the instructor. A

practical course in the technical sketching and drafting of working drawings essential in the development of the design of sets and properties for theater, television and motion picture productions. Mr. Corrigan

**146B. Scene Painting Techniques. (½ course)**

Laboratory, two hours. Prerequisite: course 40. The study of scenic painting techniques and materials, and their relation to the realization of color design and elevations. Mr. Corrigan

**148A-148B-148C. Special Courses in Design and Technical Theater.**

Hours to be arranged. Prerequisite: consent of the instructor. Group study of selected subjects in design and technical theater for students in the Design/Technical Theater specialization. 148A is offered in the fall, 148B is offered in the winter, and 148C is offered in the spring. The Staff

**160A. Fundamentals of Play Direction.**

Two two-hour meetings, with outside hours to be arranged. Prerequisite: course 130. Required of theater arts majors with specialization in theater or secondary teaching credential. Basic theories of play direction and their application through the preparation of scenes under rehearsal conditions. Mr. Helstien, Mr. Hethmon, Mr. Kerans

**160B. Fundamentals of Play Direction. (½ course)**

Three hours on Saturday morning, with outside hours to be arranged. Prerequisite: course 160A and consent of the instructor. Required of theater arts majors with specialization in the secondary teaching credential. A course in the application of stage direction techniques to the one-act play. Each student will direct a one-act play to be performed under rehearsal conditions. Material will be drawn from published sources.

**161. Advanced Play Direction.**

Lecture, four hours; laboratory, as required by one-act program. Prerequisites: course 160A and consent of the instructor. May be substituted for 160B by a theater arts major with specialization in the secondary teaching credential. Special problems in the direction of original one-act plays under production conditions. May be repeated for a maximum of eight units credit, with consent of the instructor. Mr. Hearn

**170. Theater Laboratory.**

Lecture, four hours; laboratory, as required by one-act program. Prerequisites: courses 40, 41, 42, 143A. (May not be taken concurrently with courses 140A, 141A, 142A, 172A or 172B.) Required of theater arts majors with specialization in theater or secondary teaching credential. Laboratory in theater production, under supervision. The translation of ideas and concepts into the dramatic form. Mr. Crabs

**171A. Advanced Theater Laboratory.****(½ or 1 course)**

Hours to be arranged. Prerequisite: consent of the instructor. May be taken for a maximum of one course. Creative participation as an actor or stage manager in the public presentation of departmental productions. The Staff

**171B. Advanced Theater Laboratory.****(½ or 1 course)**

Hours to be arranged. Prerequisite: consent of the instructor. May be taken for a maximum of one course. Creative participation in the realization of production elements related to the public presentation of department productions. The Staff

**172A-172B. Technical Theater Laboratory.****(½ course each)**

Hours to be arranged. Prerequisites: courses 40, 41, 42. (May not be taken concurrently with courses 140A, 141A, 142A or 170.) Required of theater arts majors with specialization in theater or secondary teaching credential. The Staff

**190A-190B. The Role of Management in Theater.****(½ course each)**

Lecture, two hours; laboratory hours to be arranged. A study of the artistic, social and economic criteria for decision-making in theater administration, and the processes for carrying out those decisions. Considerations governing decisions affecting management of the various producing bodies in the theater arts. 190A is offered in the fall and winter quarters and 190B is offered in the winter and spring quarters. Courses must be taken in sequence.

Mr. Cauble**191. The Touring Company. (2 or 3 courses)**

Lecture, 20 hours; laboratory, 22 hours. Prerequisite: consent of instructor. Rehearsal and technical preparation of a theatrical work for touring, and the performance of that work on tour.

Mr. Jones**MOTION PICTURE AND TELEVISION/RADIO AREAS****106A. History of the American Motion Picture.**

Lecture, four hours; laboratory, two hours; tutorial, one hour. Prerequisite: consent of the instructor. An historical and critical survey, with examples, of the American motion picture both as a developing art form and as a medium of mass communication. Mr. Suber

**106B. History of the European Motion Picture.**

Lecture, four hours; laboratory, two hours; tutorial, one hour. Prerequisite: consent of the instructor. An historical and critical survey, with examples, of the European motion picture both as a developing art form and as a medium of mass communication.

Mr. Gray**107. Experimental Film.**

Lecture, 4 hours; laboratory, to be arranged. This course may be repeated for credit with departmental consent (maximum 2 courses).<sup>\*</sup> A study and analysis of unconventional developments in the cinema. On different occasions, different aspects will be studied—underground cinema, mixed media, expanded cinema, etc. Mr. Skoller

**108. History of Documentary Film.**

Lecture, four hours; laboratory, two hours. Prerequisite: consent of the instructor. Required of motion picture and television specializations. The philosophy of the documentary approach in the motion picture. The development of critical standards, and an examination of the techniques of teaching and persuasion used in selected documentary, educational, and propaganda films. Mr. Suber

<sup>\*</sup> Determined on basis of change in course content.

**109A-109B-109C. Directed Studies in Film History.**

Hours to be arranged. Prerequisites: 5C, 106A-106B, 108. Admission will be reserved for candidates in a limited enrollment critical studies program in the senior year. Individual studies in motion picture history, under faculty supervision. The three-term sequence will be taken as a year course beginning in the Fall, culminating in a manuscript which meets publication standards.

Mr. Gray, Mr. Suber**110. History of Television and Radio.**

Lecture, four hours. Prerequisite: course 5C. Required of television and radio history here and abroad. Consideration of the social responsibilities and educational implications of broadcasting. Mr. Kingson

**111. Film Distribution and Exhibition.**

Lecture, three hours; laboratory, to be arranged. Prerequisite: consent of instructor. History and theory of organization of theatrical and nontheatrical distribution and exhibition of motion pictures and analysis of their interrelationships with production practices. Mr. Epstein

**112. Film and Social Change.**

Lecture, four hours; laboratory, to be arranged. The development of documentary and dramatic films in relation to and as a force in social development. Mr. Taylor

**113. Film Authors.**

Lecture, four hours; laboratory, to be arranged. May be repeated for credit with departmental consent.<sup>\*</sup> A study in depth of a specific film author (director or writer). Mr. Epstein, Mr. Suber

**114. Film Genres.**

Lecture, four hours; laboratory, to be arranged. This course may be repeated for credit with departmental consent (maximum 2 courses).<sup>\*</sup> Study of a specific film genre, e.g. the Western, the gangster cycle, the musical, the silent epic, the comedy, the social drama. Mr. Epstein, Mr. Suber

**116. Criticism.**

Lecture, four hours; laboratory, to be arranged. May be repeated for credit with departmental consent.<sup>\*</sup> Study of and practice in criticism for the theater, motion pictures and television. Mr. Fagen

**126A. Advanced Acting for Television, Radio and Motion Pictures.**

Laboratory, six hours. Prerequisite: course 20A or consent of the instructor. Projects in acting for television and motion pictures. Video tapes and playback critiques. Mr. Friedman

**126B. Broadcast Speech.**

Laboratory six hours. Intensive study of effective speech for the actor, commentator and announcer in television and radio. Audio and video tape recording of selected acting exercises and readings. Mr. Kingson

**133. Problems in Dramatic Writing.**

Lecture, two hours; laboratory, to be arranged. Prerequisite: consent of instructor. Discussion of the problems of writing for theater, film and television with an analysis of the requirements of each medium. Mr. MacDougall

**134. Film Writing. (2 courses)**

Lecture, four hours. This course is not open for credit to students who have 8 units of 134A or 134B. Introduces students to problems of film writing and determines candidacy for advancement in writing specialization in second-year program.

Mr. MacDougall, Mr. Menger, Mr. Thor

**135A-135B-135C. Advanced Film Writing.**

(2 courses each)

Lecture, three hours. Prerequisite: admission to writing specialization. A double course in second-year film writing taken each term, functioning as a yearlong workshop in story conference form, or in individual interviews. Original film/television material to be developed.

Mr. MacDougall, Mr. Thor

**137A-137B-137C. Advanced Television Writing.**

(2 courses each)

Lecture, three hours. Prerequisite: admission to writing specialization. Not open to students who have taken 136D-136E-136F. A double course in second-year television writing taken each term, functioning as a yearlong workshop in story conference form, or in individual interviews. Original film/tv material to be developed.

**138. Film Analysis.**

Lecture, two hours; laboratory, 2 hours. Prerequisite: consent of instructor. The detailed analysis of the development of a feature length film from original manuscript through screenplay to completed film.

Mr. MacDougall, Mr. Thor

**151. Design for Motion Pictures and Television.**

(½ or 1 course)

Hours to be arranged. Prerequisites: Film Project 1 (179A) and consent of the project faculty. May be repeated for a maximum of three course credits. Supervised exercises in design.

The Staff

**152. Motion Picture Sound. (½ or 1 course)**

Hours to be arranged. Prerequisites: Film Project 1 (179A) and consent of the project faculty. May be repeated for a maximum of three course credits. Supervised exercises in sound for motion pictures.

The Staff

**153A. Motion Picture Photography. (½ or 1 course)**

Hours to be arranged. Prerequisites: Film Project 1 (179A) and consent of the project faculty. May be repeated for a maximum of three course credits. Supervised exercises in motion picture photography.

The Staff

**153C. Color Cinematography.**

Lecture, three hours. Prerequisite: course 153A or consent of instructor. History and theories of color photography with emphasis on present-day methods in motion picture and television production. A comparative study of additive and subtractive systems as employed by Technicolor, Ansco, Kodak, and others.

Mr. Trimble

**154. Editing for Motion Pictures. (½ or 1 course)**

Hours to be arranged. Prerequisites: Film Project 1 (course 179A) and consent of the project faculty. May be repeated for a maximum of three courses credit. Supervised exercises in editing for motion pictures.

The Staff

**164. Direction for Motion Pictures. (½ or 1 course)**

Hours to be arranged. Prerequisites: Film Project 1 (course 179A) and consent of the project faculty. May be repeated for a maximum of three courses credit. Supervised exercises in motion picture direction.

The Staff

**179A. Film Project 1. (2 courses)**

Hours to be arranged. Required in the motion picture specialization. May be repeated once for credit, by consent of the faculty. Repetition may be required before admission to Film Project 2 (179B). The completion of a first film, including its writing, production and editing.

Mr. Adams in charge

**179B. Film Project 2. (2 or 4 courses)**

Hours to be arranged. Prerequisites: Film Project 1 (course 179A) and consent of instructor. May be taken at student's option for 16 units in one quarter or eight units per quarter for two quarters. The completion of a second film, including its writing, production and editing.

Mr. J. Young

**181A. Animation Design in Theater Arts.**

Lecture, three hours; laboratory, three hours. Prerequisite: consent of the instructor. History and use of speech, rhythm, and graphic design to form effective communication on film.

**181B. Writing for animation. (1 or 2 courses)**

Lecture, three hours; laboratory, eight hours. Prerequisite: course 181A and consent of the instructor. Research and practice in creative writing and planning for the animated film.

**181C. Animation Workshop. (1 or 2 courses)**

Laboratory, eleven hours. Prerequisite: course 181B and consent of the instructor. May be repeated once for credit. Organization and integration of the various creative arts used in animation to form a complete study of a selected topic.

**185A-185B-185C. Television Production.**

(1 or 2 courses each)

Laboratory, eight hours. Prerequisites: Project 1 (course 179A) and consent of staff. Instruction and supervised exercises in television camera, lighting, and sound; direction for television, and the creation and production of television programs.

Mr. Ross

**186A-186B-186C. Television Studio Laboratory.**

(1 or 2 courses each)

Laboratory, to be arranged. Prerequisite: 185A or consent of staff. Supervised creative participation in the production of advanced television programs.

Mr. LaTourrette

**187. Remote Television Broadcasting.**

Laboratory, four hours. Prerequisites: Project 1, 185ABC and consent of instructor. Instruction and supervised exercises in the planning and production of remote on-location television programs.

Mr. Trachinger

**188. The Aesthetics of Visual Communication.**

Lecture, three hours. Prerequisites: upper division standing and consent of instructor. An introduction to the study of communication in art, with an emphasis on the problem of aesthetic perception and its proper role in the experience of contemporary visual arts.

Mr. Fagen



**195. Senior Seminar in Motion Pictures.**

Lecture, three hours. Prerequisite: senior standing. The preparation of a paper on some aspect of contemporary cinema. The Staff

**196. Senior Seminar in Television Programming.**

Lecture, three hours. Prerequisite: senior standing. Required of all television general majors. A course designed to bring together the various aspects of his study in a terminal essay on a creative aspect of contemporary television. May be repeated for no more than a maximum of eight (8) units The Staff

**SPECIAL STUDIES FOR ALL SPECIALIZATIONS****198A-198H. Special Courses in Theater Arts—  
Theater. (½ or 1 course)**

Hours to be arranged. Prerequisites: upper division major in Theater Arts or consent of the instructor. Group study of selected theater arts subjects. Maximum of 2 courses in 198A-198Z will apply on the major requirement. The Staff

**198J-198R. Special Courses in Theater Arts—  
Motion Picture. (½ or 1 course)**

Hours to be arranged. Prerequisites: upper division major in Theater Arts or consent of the instructor. Group study of selected theater arts subjects. Maximum of 2 courses in 198A-198Z will apply on the major requirement. The Staff

**198S-198Z. Special Courses in Theater Arts—  
Television. ½ or 1 course)**

Hours to be arranged. Prerequisites: upper division major in Theater Arts or consent of the instructor. Group study of selected theater arts subjects. Maximum of 2 courses in 198A-198Z will apply on the major requirement. The Staff

**199. Special Studies in Theater Arts.  
(½ to 2 courses)**

Hours to be arranged. Prerequisites: senior standing and consent of the instructor. May be repeated for a total of two courses. The Staff

**Graduate Courses**

Certain graduate courses concerned with individual student projects may be repeated for credit upon recommendation of the departmental graduate adviser. Not open to undergraduate students. See College of Fine Arts, Unit Requirements, pages 90-93.

**200. Bibliography and Methods of Research in  
Theater Arts.**

Section 1. Theater. Section 2. Motion Pictures. Section 3. Television-Radio.

Mr. Hethmon, Mrs. Schwartz, Mr. Suber

**201. Seminar in Theater History.**

Selected topics from European and American theater studies. Mr. Hethmon

**202A. Seminar in the Classical and Medieval  
Theater.**

Prerequisite: course 102A or consent of the instructor. Limited to students in the Ph.D. program. Studies in the history of the theaters of Greece, Rome, and the Middle Ages. Mr. Gray

**202B. Seminar in the Renaissance, Baroque and  
18th Century Theater.**

Prerequisite: course 102A or consent of the instructor. Limited to students in the Ph.D. program. Studies in English and continental theater from 1485 to 1800. Mr. Goodman, Mr. Hethmon

**202C. Seminar in 19th and 20th Century Theater.**

Prerequisite: course 102B or consent of the instructor. Limited to students in the Ph.D. program. Studies in English and continental theater from 1800 to the present. Mr. Goodman, Mr. Kerans

**202D. Seminar in American Theater.**

Prerequisite: course 104 or consent of the instructor. Limited to students in the Ph.D. program. Studies in American theater from 1665 to the present. Mr. Hethmon

**205A. The Background of Theatrical Art.**

An analysis of the aesthetic principles and content of the tragic theater. Mr. Boyle

**205B. The Background of Theatrical Art.**

An analysis of the aesthetic principles and content of the comic theater. Mr. Boyle

**206A. Seminar in European Motion Picture History.**

Prerequisites: course 106B and/or consent of the instructor. Mr. Gray

**206C. Seminar in American Motion Picture History.**

Prerequisite: course 106A and consent of the instructor. Mr. Suber

**208A. Seminar in Film Structure.**

Prerequisites: courses 179A-179B and consent of instructor. An examination of various film conventions, both fictional and nonfictional, and of the role of structure in the motion picture. Mr. C. Young

**208B. Film Aesthetics.**

Prerequisite: consent of the instructor. Study and analysis of the film in relation to other art forms. Mr. Gray

**209A. Seminar in Documentary Film.**

Prerequisite: consent of the instructor. The non-fictional film and its relation to contemporary culture.

**209B. Seminar in Fictional Film.**

Prerequisite: consent of the instructor. Film as fiction and its relation to contemporary culture.

**209C. Seminar in Ethnographic Film.**

(Same as Anthropology 270A.) Lecture: three hours; laboratory: three hours. The ethnographic film as a form of realist cinema and its relations to cultural anthropology. Offered in the fall quarter. Mr. Hawkins, Mr. C. Young

**210. Seminar in Radio and Television History.**

Advanced study of world-wide developments and concepts in broadcasting from early wireless communications to international television. Mr. Kingdon

**215. Teaching Secondary School Drama.**

Study of current methods and problems of production as related to teaching on the secondary level. Restricted to candidates for teaching certificates and approved theater arts majors.

**220A-220B-220C. Problems in Acting.**

Study of the principal theories of acting and their application in studio exercises and laboratory productions.  
Mr. Goodman

**230A-230B-230C. Advanced Playwriting.**

Prerequisite: course 130A, and consent of instructor. Guided completion of a full-length play, or study and preparation for the writing of a thesis play.  
Mr. Savage

**240. The Contemporary Playhouse.**

Advanced study of the concept, form and function of the contemporary playhouse and its equipment.  
Mr. Hearn

**241. Research in Technical Theater.**

Laboratory research in technical processes and equipment in theater.  
Mr. Hearn

**243A-243B-243C. Advanced Problems in Design for the Theater.**

Study and practice in the design of stage productions. Determination of approach and style in setting and costume; solution of engineering problems in multiscene production; coordination of all design elements, including lighting.  
Mr. Corrigan

**245A-245B. Production Planning in Theater.**

(½ course each)

Lecture, two hours. 245A is offered in the fall and winter quarters and 245B is offered in the winter and spring quarters. The courses must be taken in sequence.  
Mr. Corrigan and Staff

**247. Production Planning in Television-Radio.**

Seminar, three hours; plus field studies in professional motion picture and television studios.  
Mr. Ross in charge

**251. Advanced Design for Motion Pictures. (½ to 1 course)**

Hours to be arranged. Prerequisites: course 151 and/or consent of the instructor. May be repeated for a maximum of three courses credit. Advanced study and practice of techniques and methods of design for motion pictures. Art direction for advanced workshop productions in the project sequence.  
Mr. Schoppe

**260A-260B-260C. Problems in Stage Direction.**

Special problems in the direction of the full-length play.  
Mr. Boyle

**265A-265B. Ethnographic Film Direction.**

(1 to 2 courses)

(Same as Anthropology 270B-270C.) Hours to be arranged. Prerequisites: course 209C and consent of the instructor. Advanced study of problems in the production of ethnographic films. 265A is offered in the winter quarter and 265B is offered in the spring quarter.  
Mr. Hawkins, Mr. C. Young

**270. Seminar in Television Criticism.**

Lecture, three hours. Prerequisite: consent of instructor. An analysis of key aesthetic questions and their relevance to criticism of television and other popular arts.  
Mr. Fagen

**275A. Seminar in Television Drama.**

Lecture, four hours. Prerequisite: consent of instructor. A critical survey and analysis of the drama written and produced specifically for television from the so-called Golden Age of the medium to the present.  
Mr. Ross

**275B. Seminar in Television Documentary.**

Lecture, four hours. Prerequisite: consent of instructor. A critical survey and analysis of the structure and content of the documentary as specifically created, written, and produced for television.  
Mr. LaTourette

**288. Seminar in Educational Television.**

Lecture, three hours. Prerequisite: consent of the instructor. An historical survey and critical analysis of public, educational, and instructional television in the United States and overseas.  
Mr. Kingdon

**291. The Role of Management in Motion Pictures.**

Lecture, three hours; quiz, one hour. A study of the artistic, social, and economic criteria for decision-making in the production and distribution of motion pictures.  
Mr. Grauel in charge

**298A-298B. Special Studies in Theater Arts.**

Lecture, four hours. Prerequisite: consent of instructor. May be repeated once for credit. Seminar study of problems in theater arts, organized on a topic basis. Students research subtopics within a general field, and prepare papers for presentation as lectures in a 198 course to be offered the following term by the same instructor who will edit these papers for possible publication.

**Professional Courses****370. The Teaching of Theater.**

Lecture, three hours. Prerequisites: courses 160A-160B or consent of the instructor. Required of theater arts majors in secondary teaching credential specialization. A study of class management, organization of teaching material, and method of subject matter presentation and play production in secondary schools.  
Mr. Ingle

**420A. Advanced Techniques in Acting.**

(1 to 2 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice, and movement. Preparation and presentation of scenes under supervision of faculty and student directors. Restricted to M.F.A. candidates. Offered in the fall quarter.

**420B. Advanced Techniques in Acting.**

(1 to 2 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice, and movement. Preparation and presentation of scenes under supervision of faculty and student directors. Restricted to M.F.A. candidates. Offered in the winter quarter.

**420C. Advanced Techniques in Acting.**

(1 to 2 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice, and movement. Preparations and presentation of scenes under supervision of faculty and student directors. Restricted to M.F.A. candidates. Offered in the spring quarter.

**421A. Advanced Projects in Acting.**  
(1 to 3 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice, and movement. Preparation and presentation of major role under performance conditions. Restricted to M.F.A. students. Offered in the fall quarter.

**421B. Advanced Projects in Acting.**  
(1 to 3 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice and movement. Preparation and presentation of major role under performance conditions. Restricted to M.F.A. students. Offered in the winter quarter.

**421C. Advanced Projects in Acting.**  
(1 to 3 courses)

Prerequisite: consent of the instructor. Class exercises in acting, voice and movement. Preparation and presentation of major role under performance conditions. Restricted to M.F.A. students. Offered in the spring quarter.

**432. Manuscript Evaluation.**

Lecture, four hours; laboratory, to be arranged. Prerequisites: course 132 or consent of instructor and admission to M.F.A. writing program. Will be taken twice for credit (once each year of M.F.A. residence). Evaluation of manuscripts of beginning writers including but not limited to those produced in the beginning writing course Theater Arts 134.

Mr. MacDougall, Mr. Thor

**434. Advanced Film Writing. (1 to 2 courses)**

Lecture, three hours; laboratory to be arranged. Prerequisites: courses 135A-135B-135C, 179A and/or consent of the instructor. Advanced problems in the writing of feature-length scripts. May be repeated for a maximum of six courses.

Mr. Menger, Mr. Thor

**436A-436B. Advanced Television Writing.**

Prerequisites: courses 137A-137B-137C, 179A, and/or consent of the instructor. Advanced problems in writing for television.

**437. Nondramatic Writing for Television.**

Advanced problems in the field of documentary and special feature programs with emphasis on research and pre-production.

Mr. LaTourette

**443. Advanced Problems in Design.**

Prerequisite: consent of the instructor. Study and practice in the design of stage productions. Determination of approach and style in setting and costume; solution of engineering problems in multiscene production; coordination of all design elements, including lighting. May be repeated for a total of three courses. Restricted to M.F.A. candidates.

Mr. Corrigan

**446. Production Planning in Motion Pictures.**  
(½ or 1 course)

Lecture, 3 hours; laboratory to be arranged. Prerequisite: consent of the instructor.

Mr. Gravel

**457. Design for Television.**

Prerequisite: consent of the instructor. Study and practice in design of television productions. Consideration of style as it relates to all elements of design in live and recorded television programs.

Mr. Wollock

**460A. Problems in Advanced Direction for the Stage.**

Prerequisite: consent of the instructor. Preparation and presentation of a series of scenes and a one-act play or its equivalent. Discussion and critique of work in progress. Restricted to M.F.A. candidates. Offered in the fall quarter.

Mr. Kerans

**460B. Problems in Advanced Direction for the Stage.**

Prerequisite: consent of the instructor. Preparation and presentation of a full length play under rehearsal conditions. Discussion and critique of work in progress. Restricted to M.F.A. candidates. Offered in the winter quarter.

Mr. Kerans

**460C. Problems in Advanced Direction for the Stage.**

Prerequisite: consent of the instructor. Preparation and presentation of a full length original play under rehearsal conditions. Discussion and critique of work in progress. Restricted to M.F.A. candidates. Offered in the spring quarter.

Mr. Kerans

**462. Production Project in Direction for the Stage.**

Prerequisite: consent of the instructor. Preparation and presentation of an original play under minimal production conditions. Discussion and critique of work in progress. Restricted to M.F.A. students. Offered in the winter quarter.

Mr. Kerans

**463. Production Project in Direction for the Stage.**  
(2 courses)

Prerequisite: consent of the instructor. Preparation and presentation of play under fully produced theater conditions. Restricted to M.F.A. students.

Mr. Kerans

**464A-464B. Motion Picture Direction.**  
(1 or 2 courses)

Prerequisite: consent of the instructor. Special problems in the direction of fictional and documentary motion pictures.

Mr. J. Young in charge

**466A-466B. Advanced Television Direction.**  
(1 or 2 courses)

Prerequisite: consent of the instructor. Special problems in the direction of dramatic and documentary television programs.

Mr. Wollock

**472. The Master of Fine Arts Company. (½ course)**

Prerequisite: admission to M.F.A. program. Required each quarter for the M.F.A. in Theater. May be repeated for credit.

Mr. Helstien

**479A-479B-479C. Film Project 3. (1, 2 or 3 courses)**

Hours to be arranged. Prerequisite: consent of the project faculty. The completion of a third film, including its writing, design, production and editing.

Mr. J. Young in charge

**480A-480B-480C. Workshop in Radio and Television News.**

Laboratory, eight hours. Prerequisite: consent of the faculty. Instruction and supervised exercises in reporting, editing, and producing radio and television news, public affairs, and documentary programs.

Mr. LaTourette

**482A-482B. Advanced Animation Workshop.**

(1 or 2 courses)

Lecture, three hours; laboratory to be arranged. Prerequisites: courses 181A-181B-181C and consent of the instructor. Organization and integration of various creative arts used in animation, resulting in the production of a complete animated film.

**485A-485B-485C. Advanced Television Production.**

(2 courses each)

Laboratory, 16 hours. Prerequisites: Project 1 (course 179A), 185ABC and consent of staff. Instruction in the creation, preparation, and production of advanced television programs. Mr. Wollock

**488A-488B-488C. Educational Television Workshop.**

Laboratory, eight hours. Prerequisite: consent of staff. Instruction and supervised exercises in directing and producing television programs for educational purposes. Mr. LaTourette

**495. Problems in the Teaching of Theater Arts.**

Lecture, one-two hours; laboratory, two-three hours. Prerequisite: consent of chairman. Study of and practice in the teaching of Theater Arts at the college and university level. Mr. Suber in charge

Individual Study and Research

**596A. Directed Individual Studies: Research.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**596B. Directed Individual Studies: Writing.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**596C. Directed Individual Studies: Directing.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**596D. Directed Individual Studies: Design.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**596E. Directed Individual Studies: Acting.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**596F. Directed Individual Studies: Production.**

(½ to 3 courses)

Prerequisite: graduate standing. May be repeated by consent of the instructor. The Staff

**597. Preparation for the Qualifying Examination for the Ph.D. in Theater History. (½ to 2 courses)**

May be repeated for a total of three courses.

The Staff

**598. M.A. Thesis in Theater Arts. (½ to 2 courses)**

Research and writing for the M.A. thesis. Limited to students who have been advanced to candidacy. May be repeated for a total of three courses.

The Staff

**599. Dissertation in Theater History. (½ to 2 courses)**

Research and writing for the doctoral dissertation. Limited to students who have been advanced to candidacy. May be repeated for a total of three courses.

The Staff

Required Courses in Other Departments in Theater and/or Secondary Teaching Credential Specializations

Classics 142. Ancient Drama.

English 103. Shakespeare. 167. The Drama, 1842 to the Present.

Humanities 1A-1G. World Literature. or English 10A-10B-10C.

Related Courses in Other Departments

Dance 20. Movement for the Stage.

121. Movement for the Stage.

152A-152B. Organization of Dance Performances.

English 112. Children's Literature.

135A-135B-135C. Creative Writing: Drama.

Integrated Arts 1A-1B-1C.

Music 72A-72C. Opera Workshop.

135A-135B-135C. History of Opera.

136. Music for the Legitimate Drama and Dramatic Motion Pictures.

172A-172E. Opera Workshop.

Philosophy 160. Philosophy of Art.

**ZOOLOGY**

(Department Office, 2203 Life Sciences Building)

Albert A. Barber, Ph.D., *Professor of Zoology (Chairman of the Department).*George A. Bartholomew, Ph.D., *Professor of Zoology.*John N. Belkin, Ph.D., *Professor of Zoology.*Nicholas E. Collias, Ph.D., *Professor of Zoology.*Frederick Crescitelli, Ph.D., *Professor of Zoology.*Roger O. Eckert, Ph.D., *Professor of Zoology.*Franz Engelmann, Ph.D., *Professor of Zoology.*

- Herbert Friedmann, Ph.D., *Professor of Zoology in Residence*.  
 Malcolm S. Gordon, Ph.D., *Professor of Zoology*.  
 Thomas R. Howell, Ph.D., *Professor of Zoology*.  
 Theodore L. Jahn, Ph.D., *Professor of Zoology*.  
 Thomas W. James, Ph.D., *Professor of Zoology*.  
 J. Lee Kavanau, Ph.D., *Professor of Zoology*.  
 Kenneth S. Norris, Ph.D., *Professor of Natural History*.  
 Everett C. Olson, Ph.D., *Professor of Zoology*.  
 Richard W. Siegel, Ph.D., *Professor of Zoology*.  
 Fritiof S. Sjöstrand, M.D., Ph.D., *Professor of Zoology*.  
 Clara M. Szego (Mrs. Sidney Roberts), Ph.D., *Professor of Zoology*.  
 Peter P. Vaughn, Ph.D., *Professor of Zoology*.  
 Boyd W. Walker, Ph.D., *Professor of Zoology*.  
 Gordon H. Ball, Ph.D., *Emeritus Professor of Zoology*.  
 Raymond B. Cowles, Ph.D., *Emeritus Professor of Zoology*.  
 Waldo H. Furgason, Ph.D., *Emeritus Professor of Zoology*.  
 Edgar L. Lazier, Ph.D., *Emeritus Professor of Zoology*.  
 Luciano Barajas, M.D., *Associate Professor of Zoology*.  
 Joseph Cascarano, Ph.D., *Associate Professor of Zoology (Vice-Chairman of the Department)*.  
 John H. Fessler, Ph.D., *Associate Professor of Molecular Biology in Zoology*.  
 Alan D. Grinnell, Ph.D., *Associate Professor of Zoology*.  
 Robert C. Lasiewski, Ph.D., *Associate Professor of Zoology*.  
 Leonard Muscatine, Ph.D., *Associate Professor of Zoology*.  
 Richard K. Orkand, Ph.D., *Associate Professor of Zoology*.  
 Vladimir Walters, Ph.D., *Associate Professor of Zoology*.  
 Sarah R. Atsatt, Ph.D., *Associate Professor of Zoology, Emeritus*.  
 James H. Brown, Ph.D., *Assistant Professor of Zoology*.  
 Clifford F. Brunk, Ph.D., *Assistant Professor of Zoology*.  
 Martin L. Cody, Ph.D., *Assistant Professor of Zoology*.  
 Paul C. Denny, Ph.D., *Assistant Professor of Zoology*.  
 Donald Landenberger, Ph.D., *Assistant Professor of Zoology*.  
 Austin J. MacInnis, Ph.D., *Assistant Professor of Zoology*.  
 John R. Merriam, Ph.D., *Assistant Professor of Zoology*.  
 James G. Morin, Ph.D., *Assistant Professor of Zoology*.  
 John D. O'Connor, Ph.D., *Assistant Professor of Zoology*.  
 Dan S. Ray, Ph.D., *Assistant Professor of Molecular Biology in Zoology*.  
 Winston A. Salsler, Ph.D., *Assistant Professor of Molecular Biology in Zoology*.  
 Larry Simpson, Ph.D., *Assistant Professor of Zoology*.  
 ———, *Assistant Professor of Zoology*.



- John E. Bleck, B.S., *Museum Scientist, Ichthyology*.  
 James Miller, *Senior Museum Scientist, Ornithology and Mammalogy (Dickey Collection)*.  
 Jowett C. Chao, Ph.D., *Research Zoologist*.  
 Ellen L. Coutlee, Ph.D., *Lecturer in Zoology*.  
 Walter Ebeling, Ph.D., *Professor of Entomology*.  
 Wilbur T. Ebersold, Ph.D., *Associate Professor of Botany*.  
 Bernice A. Filerman, M.S., *Associate in Zoology*.  
 Charles L. Hogue, Ph.D., *Research Associate*.  
 Alexander Kolin, Ph.D., *Professor of Biophysics*.  
 David R. Krieg, Ph.D., *Associate Professor of Bacteriology*.

F. Harlan Lewis, Ph.D., *Professor of Botany.*  
 John B. Loefer, Ph.D., *Research Associate.*  
 Roy J. Pence, *Specialist (Entomology).*  
 Bernard O. Phinney, Ph.D., *Professor of Botany.*  
 William R. Romig, Ph.D., *Professor of Bacteriology.*  
 Robert Schick, Ph.D., *Assistant Research Zoologist.*  
 Henry J. Thompson, Ph.D., *Professor of Botany.*  
 Bernard Weinstein, M.S., *Associate in Zoology.*

#### Preparation for the Major

Required: Biology 1A-1B; Chemistry 1A-1B-1C, Chemistry 4A-4B-4C and Chemistry 6A-6B-6C; Mathematics 3A-3B-3C or Mathematics 11A-11B-11C; Physics 6A-6B-6C.

#### Preliminary Examination in Biology

Students who wish to be exempted from Biology 1A-1B must pass the Preliminary Examination in Biology which is given within ten days of the beginning of instruction for the Fall Quarter. The time and location of this examination will be announced in the Schedule of Classes and posted on the Biology 1A-1B bulletin board opposite Life Sciences 2305.

#### Requirements for the Major

The core curriculum consisting of Zoology 101, 104, 107, 108, 109, 111, 115, and at least three elective courses which may be chosen from among the courses numbered higher than 115 in the zoology list. Two of the four elective courses for the zoology major may be upper division bacteriology, botany, chemistry, mathematics (except Mathematics 100), or physics courses.

#### Honors in Zoology

Requirements for admission to candidacy for Honors in Zoology are the same as those required for admission to the Honors Program of the College of Letters and Science. Highest Honors in Zoology are awarded to those students who meet the College requirements for honors, and have satisfactorily completed honors research course 190. Honors in Zoology are awarded to those students that have a cumulative GPA of 3.25, and have completed 20 courses at the University of California. Special cases are decided by the Departmental Honors Committee.

#### Graduate Study

The departmental requirements (including those in chemistry, physics, and mathematics) for a bachelor's degree in zoology represent most of the background necessary

as preparation for research leading to advanced degrees in zoology, but certain fields of study will require additional training in the basic sciences.

Students who plan to enter a graduate school are urged to seek advice of staff members in their field of interest. Prospective applicants to this Department are invited to visit the campus for this purpose.

The Department offers M.A. and Ph.D. degrees in zoology with specialization in the following fields: animal behavior, cell biology, comparative physiology, developmental biology and embryology, cytology, electron microscopy and ultrastructure, endocrinology, entomology, general physiology, genetics, herpetology, history of biology, ichthyology, insect physiology, invertebrate zoology, mammalogy, molecular biology, neuroanatomy, neurophysiology and sense organ physiology, ornithology, parasitology and physiology of parasitism, physiological ecology, population and community ecology, protozoology and protozoan physiology, radiation biology, vertebrate paleontology and vertebrate morphology, and vertebrate physiology.

#### Requirements for the General Secondary Credential

Consult the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

#### Requirements for the Master's Degree

In addition to the general requirements of the Graduate Division, the Department of Zoology requires oral and/or written examinations of any candidate for the master's degree. Although there is no formal foreign language requirement for the master's degree in zoology, a reading knowledge of a foreign language is a prerequisite for admission to certain seminars and advanced courses.

#### Requirements for the Doctor's Degree

In addition to the general requirements of the Graduate Division, every candidate for the Ph.D. degree is required to pass departmental examinations and to serve as a teaching assistant for at least one year. The

language requirements for the Ph.D. degree in zoology are usually met by examinations in one of the following: French, German, or Russian. Preparation in the languages before application to graduate school is strongly recommended.

#### Upper Division Courses

### 101. Vertebrate Morphology.

Lecture, three hours; laboratory, six hours. Prerequisite: Biology 1A-1B, or the equivalent. A study of vertebrate morphology and evolution from the viewpoint of: comparative anatomy of adult forms, developmental anatomy, and paleontology. Laboratory study of selected vertebrates.

Mr. Vaughn, Mr. Walters

### 104. Environmental Biology.

(Same as Botany 104.) Lecture, three hours; laboratory, three hours. Prerequisite: Biology 1A-1B or the equivalent. Introduction to the ecology of animals, their morphological, behavioral, and physiological adaptations, and the growth, distribution, and evolution of their populations.

The Staff

### 107. Comparative Genetics.

(Same as Bacteriology 107 and Botany 107.) Lecture, three hours. Prerequisite: Biology 1A-1B, or the equivalent. Mendelian principles; the gene: its structure, function, and chemistry, with emphasis on mutation, coding regulation, and transmission.

The Staff

### 108. General and Cell Physiology.

Lecture, two hours; laboratory, six hours. Prerequisite: Biology 1A-1B, Chemistry 4A-4B-4C and 6A-6B-6C or the equivalent. The general physiology of cells and tissues with special emphasis on the physical and chemical nature of specialized activities.

The Staff

### 109. Animal Physiology.

Lecture and lecture-discussion, three hours; laboratory, four hours. Prerequisite: Biology 1A-1B, Chemistry 4A-4B-4C and 6A-6B-6C or the equivalent. Normally to be taken after Zoology 108. An introduction to physiological principles with emphasis on organ systems and intact organisms.

The Staff

### 111. Functional Ultrastructure of Cells.

Lecture, three hours. Prerequisite: Biology 1A-1B, Chemistry 4A-4B-4C and 6A-6B-6C or the equivalent. The macromolecular and ultrastructural aspects of cells and tissues emphasizing the convergence of structure and function in life phenomena.

Mr. Barajas, Mr. Sjöstrand

### 115. Developmental Biology.

Lecture, three hours; laboratory, three hours. Prerequisite: course 107. Developmental processes in animals and other organisms; includes an analysis of structural and chemical differentiation. Mr. Denny

### 116. Advanced Developmental Biology.

Lecture, four hours. Prerequisite: course 115. Advanced discussion of cellular problems in development.

Mr. Denny

### 117A-117B. Invertebrate Zoology.

Lecture, two hours; laboratory, six hours, plus field trips. Prerequisite: course 104 or the equivalent, or consent of the instructor. Limited enrollment. Systematics, morphology, natural history, physiology, and biochemistry of invertebrates. Emphasis on independent laboratory and field investigations.

Mr. Morin, Mr. Muscatine

### 118. Introduction to Molecular Biology.

Lecture, three hours; discussion one hour. Prerequisite: Chemistry 6A-6B-6C, Mathematics 3A-3B-3C or consent of the instructor. A course in molecular biology emphasizing the synthesis, structure, function and interactions of biological macromolecules.

The Staff

### 118A. Molecular Biology Laboratory. (½ course)

Laboratory, six hours. Prerequisite: consent of the instructor. A course in experimental molecular biology to be taken concurrently with course 118. (Course 118 may be taken without 118A.)

The Staff

### 119. Protozoology.

Lecture, three hours; laboratory, six hours. Prerequisite: Biology 1A-1B, or the equivalent. A survey of the main groups of the protozoa: morphology, physiology, genetics, and ecology.

### 121. Parasitology and Symbiosis.

Lecture, three hours; laboratory, six hours. Prerequisite: Biology 1A-1B, or the equivalent. An introduction to the principles, biology, and evolution of infectiousness, symbiosis, and parasitism, emphasizing protozoan, helminth, and arthropod parasites, including those of man.

Mr. Belkin, Mr. MacInnis

### 122. Entomology.

Lecture, three hours; laboratory, six hours; several field trips. Prerequisite: course 104 or consent of the instructor. An introduction to the morphology, ecology, and classification of insects.

Mr. Belkin

### 123. Terrestrial Arthropods.

Lecture, three hours; laboratory, six hours; several field trips. Prerequisite: course 122 or consent of the instructor. Systematics, distribution, and biometrics of hexapods and arachnids.

Mr. Belkin

### 124. Insect Physiology.

Lecture, two hours; laboratory, six hours. Prerequisite: course 108 or 109 or the equivalent. Survey of the physiology of insects with emphasis on functional adaptations.

Mr. Engelmann

### 125. Ichthyology.

Lecture, two hours; laboratory, six hours; field trips. Prerequisite: courses 101 and 104. The systematics, ecology, and behavior of fishes, with special emphasis on local marine forms.

Mr. Walker

### 129. Ornithology.

Lecture, two hours; laboratory, discussion, field trips, six hours. Prerequisite: course 104 and consent of the instructor. Limited enrollment. The systematics, distribution, physiology, behavior, and ecology of birds.

Mr. Howell

### 130. Mammalogy.

Lecture, two hours; laboratory and field trips, six hours. Prerequisites: course 104 or the equivalent and consent of the instructor. The evolution, ecology, behavior, and physiology of mammals.

Mr. Brown

**133. Experimental Parasitology.**

Laboratory, eight hours. Prerequisite: consent of the instructor. Introduction to use of parasites in experiments concerning basic biological problems and to problems concerning parasitism.

Mr. MacInnis

**139. Analysis of Ecological Data.**

Lecture, three hours; laboratory, three hours. Prerequisite: consent of the instructor. Theory of experimental design and falsifiable hypotheses as applied to field ecology. Numerical and graphical methods of data reduction, with special emphasis on nonparametric procedures.

Mr. Landenberger

**140. Field Ecology.**

Lecture: two hours; laboratory, six hours plus weekend field trips. Prerequisite: course 104 and consent of the instructor. Field and laboratory research in ecology; the collection, analysis and write up of numerical data.

Mr. Cody

**143. Comparative Physiology.**

Lecture, three hours; laboratory, four hours; discussion, one hour. Prerequisite: courses 108 and 109. A detailed analysis of selected aspects of invertebrate and vertebrate physiology.

Mr. Gordon

**145. General Physiology.**

Lecture, three hours. Prerequisite: Biology 1A-1B, or the equivalent, and a course in organic chemistry. Discussion of certain fundamental principles of living matter, including origin of life, properties of viruses, organization of living matter, nature and properties of cell membranes, cellular mechanisms of secretion and molecular transfer. This is not an elementary or introductory course in physiology; neither is it a course in human physiology. It is intended for students whose primary interest is biological science.

Mr. Crescitelli

**150. Invertebrate Endocrinology.**

Lecture, three hours. Prerequisite: course 108 or 109 or consent of the instructor. A comprehensive treatment of invertebrate endocrinology.

Mr. Engelmann

**151. General Endocrinology.**

Lecture, three hours. Prerequisites: biochemistry; course 108 or 109 or the equivalent. Principles of chemical integration in biological systems.

Miss Szego

**153. Isotopic Tracers in Biology.**

Lecture, three hours; laboratory, three hours. Prerequisite: course 108 or equivalent, or consent of the instructor. The use of isotopic tracers in the study of biological processes, including methods, problems investigated, interpretation of data.

Mr. Barber

**155. Topics in Physical Chemistry for Molecular Biology. (½ course)**

Lecture, two hours. Prerequisite: consent of the instructor; the course is planned to complement Chemistry 113B or equivalent. The application of physical chemistry to specific problems in molecular biology.

Mr. Fessler

**157A. Introduction to the Nervous System.**

Lecture, three hours; discussion, one hour. Prerequisite: course 109, or consent of the instructor. Structural and functional principles of the nervous system as a general biological phenomenon. Con-

sideration of nervous elements and processes and of organized systems as communication and control systems. Survey of principal types of organization in invertebrates and vertebrates.

Mr. Eckert, Mr. Grinnell, Mr. Orkand

**157B. Introductory Laboratory in Neurophysiology.**

Laboratory, eight hours. Prerequisite: course 157A or consent of the instructor. Limited enrollment. Laboratory investigation of the function of central and peripheral nervous systems in invertebrates and vertebrates. Emphasis will be on electrophysiological approaches to basic neurophysiological problems.

Mr. Eckert, Mr. Grinnell, Mr. Orkand

**159. Anatomy and Physiology of Sense Organs.**

Lecture, three hours; discussion, one hour. Prerequisite: course 157A, or the equivalent. The anatomy and physiology of the sense organs. Comparative aspects will be emphasized.

Mr. Eckert, Mr. Grinnell, Mr. Orkand

**160. Analytical Microscopy and Cytology. (½ course)**

Lecture, two hours; demonstration, two hours. Prerequisite: general physics. A course designed for students in the biological sciences to acquaint them with quantitative cytology with emphasis on bright field, dark field, phase contrast, interference, and polarization analysis.

Mr. James

**164. The Behavior of Animals.**

Lecture, four hours. Prerequisite: course 104 or consent of the instructor. Ecological significance, underlying mechanisms, and evolution of behavior, with special reference to animal sociology under natural conditions.

Mr. Collias

**165. Behavior Research Problems.**

Lecture, three hours; laboratory, two hours. Prerequisite: consent of the instructor. Systems controls and non-obtrusive sensing procedures for behavior studies in the laboratory and field. Rationale, design, and limitations of laboratory studies of behavior.

Mr. Kavanau

**167. Marine Invertebrate Zoology. (2 courses)**

Lecture, ten hours; laboratory, 34 hours. Prerequisite: upper division standing or consent of the instructor. Offered at the Catalina Island Marine Station. Systematics, functional morphology, and natural history of all major and most minor groups; emphasis on living animals and their habitats.

The Staff

**169. Marine Ecology. (2 courses)**

Lecture, ten hours; laboratory, 34 hours. Prerequisite: upper division standing or consent of the instructor. Offered at the Catalina Island Marine Station. Structure, diversity, and energetics of marine communities; behavior, population dynamics, and biogeography of component species; associated oceanography and geology.

The Staff

**165. Seminar on Biology and Society. (½ course)**

Prerequisite: consent of the instructor. Investigations and discussions of current socially important issues involving substantial biological considerations, either or both as background for policy and as consequences of policy.

The Staff

**190. Honors Research in Zoology. (½ to 1 course)**

Prerequisite: senior standing and permission of the departmental honors committee. Individual research designed to broaden and deepen the student's knowledge of some phase of zoology.

The Staff



**199. Special Studies. (½ course)**

Prerequisite: senior standing and consent of instructor. May be repeated for a total of one course credit toward the bachelor's degree. The Staff

**Graduate Courses**

The consent of the instructor is required for admission to all graduate courses. Any additional prerequisites are stated in the course descriptions.

**201. Comparative Genetics Laboratory.**

(Same as Botany 201.) Laboratory, nine hours. Prerequisite: course 107 (may be taken concurrently). Experimental techniques demonstrating recombination, mutagenesis, biochemical pathways, complementation, and cytogenetics of plants, animals, and microorganisms. The Staff

**202. Gene Structure and Function.**

(Same as Microbiology 202 and Botany 202.) Lecture and discussion, three hours. Prerequisites: course 107 and Chemistry 153 or consent of the instructor. The genetic coding of information and its transfer from DNA through RNA to protein; the operon model and other aspects of regulatory genetics, mutations and genetic fine structure. Mr. Krieg, Mr. Romig, Mr. Siegel

**203. Chromosome Structure and Replication.**

(Same as Microbiology 203 and Botany 203.) Prerequisites: course 107 and Chemistry 153, or consent of the instructor. A survey of biochemical and biophysical investigations of the structure and replication of chromosomal nucleic acids with emphasis on bacterial and viral systems. Mr. Ray

**204. Evolution and Population Genetics.**

(Same as Botany 204.) Lecture, two hours; individual study. Prerequisite: course 104 and 107. Genetic mechanisms of evolutionary change. Mr. Lewis

**205A-205F. Topics in Genetics.**

Same as Botany 205A-205F.) Lecture. Prerequisite: course 107. Intensive study of selected topics. The Staff

**206A-206F. Advanced Genetics Laboratory.**

Laboratory, nine hours. Prerequisite: course 107. A course designed to give the student a working knowledge of a particular group of organisms or concepts. The Staff

**206. Structural Macromolecules.**

Lecture, three hours; discussion, one hour. The comprehensive molecular biology of selected structural proteins and polysaccharides, including cellular synthesis, structure and physical properties, and integrated biological functions. Mr. Fessler

**209. Molecular Biology Laboratory.**

(Same as Microbiology 209.) Lecture, two hours; laboratory, eight hours. Selected experimental approaches in molecular biology. The current emphasis is on the study of protein synthesis in cell free systems, determination of the genetic code, and the study of repressor molecules. Mr. Salsler

**210. Biochemical Analysis of Development.**

Lecture-discussion. Prerequisite: course 115 and Chemistry 4C and 6C or its equivalent. A discussion of current topics and problems in the biochemical analysis of developmental phenomena. Mr. Denny

**211. Advanced Laboratory in Developmental Biology. (½ course)**

Laboratory, six hours. Prerequisite: course 115 or 210 and Chemistry 4C and 6C or its equivalent. Laboratory problems in developmental biology. Mr. Denny

**212. Advanced Ichthyology.**

Lecture, two hours; laboratory, six hours. Prerequisite: course 125 or consent of the instructor. The higher classification and functional morphology of fishes, from an evolutionary point of view. Mr. Walters

**213. Principles of Animal Taxonomy.**

Lecture. Prerequisite: course 103. Taxonomic concepts, principles, and methods. Mr. Belkin

**214. Vertebrate Paleontology.**

(Same as Geology 214.) Lecture, three hours; laboratory, three hours. Prerequisite: course 101; recommended, a course in general geology. Limited enrollment. Study of the fossil record of the evolution of the vertebrates. Mr. Vaughn

**215. Conceptual Models in Ecology.**

Prerequisites: course 104 or equivalent; one year of calculus. Classical and current models of spatial distribution, birth and death processes, regulation of numbers, predator-prey and host-parasite relationships, interspecific competition and community structures with emphasis on stochastic processes in ecological systems. Mr. Landenberger

**216. Community Ecology.**

Lecture, three hours. Prerequisite: course 104 or the equivalent; one year of calculus. Investigation of the structure and function of animal communities, in theory and in practice; includes the concepts of coexistence, competition, niche, and diversity. Mr. Cody

**217. Field Study of Vertebrate Fossils.**

Field laboratory: 6 weeks. The field occurrence and sedimentological and stratigraphic relationships of fossils of vertebrates. Sampling techniques and interpretations of associations and paleoecology. Mr. Olson

**218. Physiological Ecology. (½ course)**

Lecture. Prerequisites: courses 104, 109. A detailed consideration of the role of physiology and behavior in the autecology of organisms in natural environments. Mr. Bartholomew, Mr. Lasiewski

**219. Advanced General Physiology.**

Lecture, three hours. Prerequisite: course 108 or 145. Discussion of specific topics such as excitation, conduction, physiology of blood, muscle contraction, etc. Students will participate in giving reports. Mr. Crescitelli

**221A. Advanced Cell Physiology. (½ course)**

Lecture, two hours. Prerequisite: course 108. The physiology of the cell membrane, including permeability, electrical, optical, and mechanical properties, and selective cytoplasmic accumulation of nonelectrolytes and ions. Mr. Jahn

**221B. Advanced Cell Physiology. (½ course)**

Lecture, two hours. Prerequisite: course 221A. Theories of the origin of bioelectromotive force, including active transport of ions; effects of polarizing currents. Mr. Jahn

**222. Experimental Cell Biology.**

Lecture, two hours; laboratory, six hours. Prerequisite: courses 108 and 111. The physiology of control mechanisms and the integration of metabolic systems at the cellular level. Individual experiments will be encouraged. Mr. James

**223A. Physiology of the Protozoa. (½ course)**

Lecture, two hours. Recommended: course 119. Protoplasmic structure, locomotion, and behavior, and the mechanisms of environmental effects (light, electricity, ions, etc.) thereon. Mr. Jahn

**223B. Physiology of the Protozoa. (½ course)**

Lecture. Recommended: course 119. Respiration, excretion, metabolism, growth, and nutrition, especially as compared with other groups of organisms.

**224. Function and Biogenesis of Subcellular Organelles.**

Lecture, three hours. Prerequisites: courses 108 and 111, Chemistry 153 or consent of the instructor. Origin, maintenance and function of highly organized subcellular entities such as mitochondria, chloroplasts, centrioles and flagella. Mr. Simpson

**226. Advanced Insect Physiology.**

Lecture, two hours; laboratory, five hours. Prerequisite: course 124 or consent of the instructor. A detailed discussion of current problems in insect physiology. Advanced laboratory. Mr. Engelmann

**227. The Vertebrate Eye.**

Lecture, three hours. Prerequisite: Biology 1A-1B, or the equivalent. The gross structure, fine structure, physiology, and biochemistry of the vertebrate eye, with emphasis on the retina and its role in vision. Mr. Crescitelli

**229. Physiology of Circulation.**

Lecture, four hours. Discussion of the dynamics of blood flow, the regulation and control of the circulation, and the physiology of arteries, veins, and capillaries. Mr. Cascarano

**230. Principles of Lipid Metabolism.**

Lecture, three hours; laboratory, three hours. Prerequisite: Chemistry 153 or consent of the instructor. Extensive investigation into the synthesis and catabolism of selected lipid moieties. Mr. O'Connor

**233. Biochemistry of Parasitism.**

Lecture, two hours; laboratory, six hours. Biochemical and physiological aspects of parasite-host relationships. Laboratory emphasis on individual research projects. Offered in alternate years. Mr. MacInnis

**235. Topics in Neurobiology.**

Lecture, three hours. Prerequisite: course 157A or the equivalent and consent of the instructor. Selected current problems in neurobiology will be discussed in depth, with emphasis on analysis of original papers. May be repeated for credit. Mr. Eckert, Mr. Grinnell, Mr. Orkand

**236. Photobiology.**

Lecture, three hours; outside reading. Prerequisite: Physics 7C or the equivalent and consent of the instructor. A survey of the effects of light on biological systems; photophysiology, ultraviolet photoproducts, photoreactivation excision-repair, ionizing radiation effects, not including photosynthesis. Mr. Brunk

**237. Laboratory in Advanced Electrophysiology. (2 courses)**

Laboratory, twelve hours. Total involvement in individual research projects under staff guidance. Approximately two projects each quarter. Course may be repeated twice.

Mr. Eckert, Mr. Grinnell, Mr. Orkand

**238. Studies of Animal Behavior.**

Discussion, two hours; laboratory, six to eight hours. Prerequisite: course 164 and consent of the instructor. Field and laboratory studies of selected problems in animal behavior. Mr. Collins

**241A-241B-241C. Electron Microscopy.**

(Same as Microbiology 241A-241B-241C.) Prerequisite: consent of the instructor, based on a written research proposal. Corequisite: concurrent enrollment in related studies in course 599. Principles of electron microscopy applied to research problems in molecular biology and microbiology. Training in quantitative methods, autoradiography, nucleic acid visualization, freeze etching. Course 241B emphasizes thin sectioning and related methods. Course 241C includes methods and principles of high resolution electron microscopy.

Mr. Barajas, Mr. Eislering, Mr. Sjöstrand

**244. The Biology of Aquatic Mammals.**

Lecture, three hours; weekend field trips. Enrollment limited to twenty students. A course in the ecology, systematics, distribution, behavior, physiology and anatomy of marine mammals. Mr. Norris

**Seminar Courses**

**250. Seminar in Current Topics in Molecular Biology. (½ course)**

The Staff

**251. Seminar in Genetics. (½ course)**

Mr. Siegel

**252. Seminar in Developmental Biology. (½ course)**

Mr. Denny

**253. Seminar in Invertebrate Zoology. (½ course)**

Mr. Muscatine

**254. Seminar in Entomology. (½ course)**

Mr. Belkin

**255. Seminar in Parasitology. (½ course)**

Mr. MacInnis

**256. Seminar in Ichthyology. (½ course)**

Mr. Walker, Mr. Walters

**258. Seminar in Biology of Terrestrial Vertebrates. (½ course)**

Mr. Bartholomew, Mr. Howell

**259. Seminar on Aquatic Mammals. (½ course)**

**260. Seminar in Vertebrate Paleontology. (½ course)**

Mr. Vaughn

- 261. Seminar in Population Biology. (½ course)**  
Mr. Brown, Mr. Cody, Mr. Landenberger
- 262. Seminar in Environmental Physiology.**  
(½ course) Mr. Lasiewski
- 263. Seminar in Marine Biology. (½ course)**  
Mr. Gordon, Mr. Muscatine
- 264. Seminar on Animal Behavior. (½ course)**  
Mr. Collias
- 265. Seminar on Behavior Research Problems.**  
Lecture, three hours; laboratory, two hours. Pre-requisite: course 165. Mr. Kavanau
- 266. Seminar in Comparative Physiology.**  
(½ course) Mr. Gordon
- 267. Seminar in Physiology of Microorganisms.**  
(½ course) Mr. Jahn
- 268. Seminar in Cell Physiology. (½ course)**  
Mr. Jahn
- 269. Seminar in the Physiology of Growth.**  
(½ course)
- 270. Seminar in Physiology and Biochemistry of Arthropods. (½ course)**  
Lecture, three hours. Prerequisite: Chemistry 153 or consent of the instructor. Recent contributions to the field of arthropodan physiology and biochemistry. Mr. Engelmann, Mr. O'Connor
- 271. Seminar in Endocrinology. (½ course)**  
Miss Szego
- 273. Seminar in Neurophysiology. (½ course)**  
Prerequisite: consent of the instructor.  
Mr. Eckert, Mr. Grinnell, Mr. Orkand
- 274. Seminar in Comparative Cell Physiology.**  
(½ course) Mr. Barber, Mr. James
- 275. Seminar in Cardiovascular Problems.**  
(½ course) Mr. Cascarano
- 276. Seminar in Molecular Biology. (½ course)**  
Mr. Sjöstrand
- 277. Seminar on Extranuclear DNA. (½ course)**  
Mr. Brunk, Mr. Simpson

**278. Evolutionary Concepts. (½ course)**

Lecture: three hours. Exploration in depth of evolutionary concepts, their diversity, biological interpretations and impact on social and humanistic patterns of today and the past. Mr. Olson

**Individual Study and Research**

The conduct of the courses listed below is supervised by a member of the faculty. He is identified by letter code as follows: LB, Luciano Barajas; AB, Albert A. Barber; GB, George A. Bartholomew; JB, John N. Belkin; HB, James H. Brown; CB, Clifford F. Brunk; JC, Joseph Cascarano; MC, Martin L. Cody; NC, Nicholas E. Collias; FC, Frederick Crescitelli; PD, Paul C. Denny; RE, Roger O. Eckert; FE, Franz Englemann; JF, John H. Fessler; MG, Malcolm S. Gordon; AG, Alan D. Grinnell; TH, Thomas R. Howell; TJ, Theodore L. Jahn; WJ, Thomas W. James; JK, J. Lee Kavanau; DL, Donald Landenberger; RL, Robert C. Lasiewski; AM, Austin J. MacInnis; JM, John R. Merriam; GM, James G. Morin; LM, Leonard Muscatine; KN, Kenneth S. Norris; JO, John D. O'Connor; EO, Everett C. Olson; RO, Richard K. Orkand; DR, Dan S. Ray; WS, Winston A. Salser; RS, Richard W. Siegel; LS, Larry Simpson; FS, Fritiof S. Sjöstrand; CS, Clara M. Szego; PV, Peter P. Vaughn; BW, Boyd W. Walker; VW, Vladimir Walters.

**596AA-596ZZ. Directed Individual (or Tutorial) Studies. (½ to 2 courses)** The Staff**296F. Directed Individual (or Tutorial) Studies. (½ to 2 courses)**

Directed individual (or tutorial) studies at the Catalina Island Marine Station. The Staff

**597AA-597ZZ. Preparation for Comprehensive Examination for the Master's Degree or Qualifying Examination for the Ph.D. (½ to 1 course)** The Staff**598AA-598ZZ. Master's Thesis Research and Writing. (½ to 2 courses)** The Staff**599AA-599ZZ. Doctoral Dissertation Research and Writing. (½ to 2 courses)** The Staff

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Olive Jean Dunn, Ph.D.

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Maurice F. Connery, D.S.W.

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