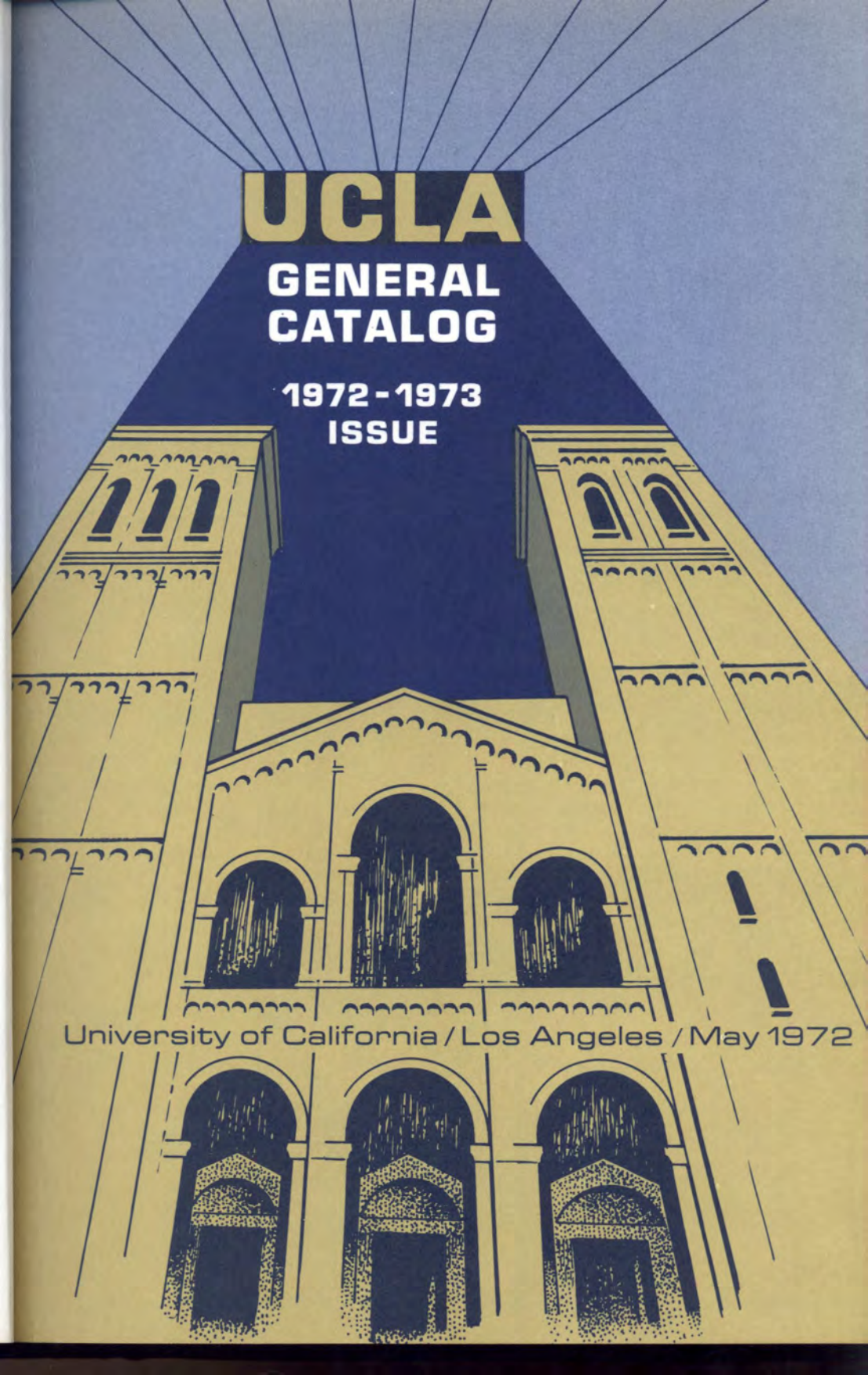


A stylized, low-angle illustration of the UCLA Campanile tower. The tower is rendered in a yellowish-gold color against a blue background. It features multiple levels of arches and windows, with a central arched entrance at the base. Lines radiate from the top of the tower towards the top corners of the page, creating a sense of height and perspective.

UCLA

**GENERAL
CATALOG**

**1972-1973
ISSUE**

University of California / Los Angeles / May 1972

UCLA

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Changes in the list of Officers of Administration and

Instruction may be made subsequent to
the date of publication.

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.

UCLA

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The University's Mission

The university's ultimate mission is education—the development of knowledge, and the communication of that knowledge to those who need to deal with it, whether as students or future practitioners in the various professions.

This means, I think, that a great deal of attention must be paid by those within the university to defining its mission clearly, to setting forth the principles upon which it was built, and to following through from those basic principles to the establishment of institutional guidelines, which maximize the likelihood of success.

Once these tasks are accomplished, we will be able to distinguish between the ways in which we can help society to establish goals, determine priorities and initiate and operate programs, and those ways in which we not only *should* not, but *cannot* become so involved.

The university serves best by attempting in a very broad way to see that we have the necessary knowledge, that we have people who are properly educated to use that knowledge, and that the problems which confront us are sufficiently well identified and understood to be dealt with appropriately.

All of us associated with the university must strive to see to it that we ourselves develop a proper understanding of this role in principle, that we make such an understanding operational, and that we communicate this understanding to the public at large. If we succeed in that task I believe we will have come a long way toward re-establishing the level of support (both tangible and intangible) which the university must have if it is to succeed in its several missions.

Charles E. Young
Chancellor

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Calendar

	Fall '72	Winter '73	Spring '73
First day to file application for undergraduate standing. (Last day will depend on the number of applications received.)	Nov 1, 1971 Monday	July 1, 1972 Saturday	Oct. 1, 1972 Sunday
*Application for admission or readmission to graduate standing, with complete credentials and the application fee, must be filed with Graduate Admissions, Office of Academic Services, on or before this date.	March 15 Wednesday	Oct. 1 Sunday	Jan. 15 Monday
Last day for graduate students to file with Graduate Admissions, Office of Academic Services, petitions for change of major.	March 15 Wednesday	Oct. 1 Sunday	Jan. 15 Monday
Last day to file application with Registrar for readmission in undergraduate standing.	July 15 Saturday	Nov. 15 Wednesday	Feb. 15 Thursday
Counseling of students by appointment.	Sept. 6- Sept. 13 Wednesday- Wednesday	Dec. 27- Dec. 28 Wednesday- Thursday	Mar. 19- Mar. 22 Monday- Thursday
Entrance Examination in English as a Second Language.	Sept. 13 Wednesday	Jan. 3 Wednesday	Mar. 27 Tuesday
Quarter begins.	Sept. 18 Monday	Jan. 3 Wednesday	Mar. 28 Wednesday
†Registration in Person	Sept. 18- Sept. 22 Monday- Friday	Jan. 3- Jan. 5 Wednesday- Friday	Mar. 28- Mar. 30 Wednesday- Friday
Examination in Subject A English Placement Test (for transfer students).	Sept. 18 Monday	Jan. 3 Wednesday	Mar. 28 Wednesday
Instruction begins.	Sept. 25 Monday	Jan. 8 Monday	Apr. 2 Monday
Last day to file applications for advancement to candidacy for the master's degree to be conferred 1972-1973.	Oct. 2 Monday	Jan. 17 Wednesday	Apr. 11 Wednesday
Last day to file Preferred Program Card or change study list, without fee.	Oct. 6 Friday	Jan. 19 Friday	Apr. 13 Friday
Last day for late registration. Before 2:00 p.m.	Oct. 6 Friday	Jan. 19 Friday	Apr. 13 Friday
Last day for graduate students to file requests for leaves of absence.	Oct. 6 Friday	Jan. 19 Friday	Apr. 13 Friday
Last day to pay course Subject A fee without lapse of status. Before 3:50 p.m.	Oct. 9 Monday	Jan. 22 Monday	Apr. 16 Monday
Last day to add courses to study lists. Before 3:50 p.m.	Oct. 17 Tuesday	Jan. 30 Tuesday	Apr. 24 Tuesday

* 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 \$25.00 late Registration Fee is assessed after these dates.

6 / CALENDAR

	Fall '72	Winter '73	Spring '73
Last day for undergraduate students to drop courses from study lists without penalty or grade F (failure). Before 3:50 p.m.	Oct. 20 Friday	Feb. 2 Friday	Apr. 27 Friday
§Last day to file notice of candidacy for the bachelor's degree to be conferred 1972-1973.	Oct. 27 Friday	Feb. 9 Friday	May 4 Friday
Last day to submit final drafts of dissertations to doctoral committees for degrees to be conferred 1972-1973.	Nov. 3 Friday	Feb. 12 Monday	May 9 Wednesday
Last day for graduate students to drop courses from study lists without penalty of grade F (failure). Before 3:50 p.m.	Nov. 6 Monday	Feb. 20 Tuesday	May 7 Monday
Last day to submit final drafts of theses to master's committees for degrees to be conferred 1972-1973.	Nov. 20 Monday	Feb. 26 Monday	May 25 Friday
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 1972-1973.	Dec. 1 Friday	March 12 Monday	June 8 Friday
Instruction ends.	Dec. 2 Saturday	Mar. 17 Saturday	June 9 Saturday
Final examinations.	Dec. 4-8 Monday-Friday	Mar. 16 Friday and Mar. 19-23 Monday-Friday	June 11-15 Monday-Friday
Quarter ends.	Dec. 8 Friday	Mar. 23 Friday	June 15 Friday
Last day for continuing students to file applications for undergraduate scholarships for 1973-1974.		Jan. 15 Monday	
Last day to file applications for fellowships and graduate scholarships tenable at Los Angeles for 1973-1974.		Jan. 31 Wednesday	
Academic and Administrative Holidays.	July 4 Tuesday Sept. 4 Monday Nov. 23-24 Thursday-Friday Dec. 22 Friday and Dec. 25 Monday Dec. 29 Friday and Jan. 1 Monday	Feb. 19 Monday Mar. 26 Monday	May 28 Monday

§ 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 110,000. 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 Management 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 69 through 154 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, predental, predental 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 schools of Engineering and Applied Science, Nursing, and Public Health 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 more than 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. A listing of *Serials Currently Received at UCLA*, published by the University Library, may be consulted at principal service points in campus libraries.

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, including facilities for reading microtext materials and for the use of typewriters. All students 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 Lawrence Clark Powell Library Building.

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

Other collections of rare materials are the Belt Library of Vinciana, in the Art Library, the Benjamin Collection of Medical History, in the Biomedical Library, and the Gross Collection of business and economic history, in the Management Library.

The Public Affairs Service, in the Research Library, provides a coordinated service embracing collections of official publications of governments and international organizations and of other books and pamphlets in the social sciences. 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 Collection is administered by the Public Affairs Service. This service provides access to research data which are available on computer tapes.

The Biomedical Library, in the Center for Health Sciences, has collections in all of the health and life sciences. Materials for engineering, astronomy, mete-

orology, 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, Chemistry, English, Geology-Geophysics, Law, Management, Maps, Music, Oriental Languages, Physics, 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. A distinguished member of the UCLA faculty is appointed each year to the Clark Library Professorship. 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 at the Reference Desk in the Research Library.

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 objectives 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; driving simulation; studies of effects of various chemical compounds on driver behavior; advancement of human simulation for trauma research and research in other fields; 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. Research efforts have also included 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 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.

Director To Be Appointed

The Institute of Evolutionary and Environmental Biology is devoted to the encouragement, support, and development of scientific research in those aspects of the biology of both living and fossil organisms which relate to: (1) their properties at organizational levels ranging from organ systems to ecosystems; (2) their interactions with their physical, chemical, and biological environments; and (3) their evolutionary histories and the underlying mechanisms which have produced their histories. The Institute membership is composed of staff members from more than a dozen departments in the biological, physical, medical, and social sciences, and its programs are largely interdisciplinary. A significant fraction of its concern is directed toward current problems in man's environment. The Institute is centered in what was previously the Ornamental Horticulture area of the campus. An important subdivision is the Laboratory of Fisheries and Marine Biology, located in the Department of Biology. **M. S. Gordon, 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 structure and function of macromolecules, molecular genetics and virology; bioenergetics, catalysis and control; molecular basis of cellular architecture, development, evolution, neurobiology and oncology. Staff members from departments in biological, physical, and med-

ical 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 facility in the Center for the Health Sciences, largely supported by the State Department of Mental Hygiene. The NPI houses the Department of Psychiatry, the Department of Neurology, and the Divisions of Neurosurgery and Neuropathology, together with research laboratories, classrooms, 248 inpatient beds, and several outpatient clinics. The research and teaching program involves a multidisciplinary approach to the problems of functional and organic disorders of the nervous system, including mental retardation; the full range of mental and emotional disorders of children and adults; and special programs in legal psychiatry, community psychiatry, research training, psychiatric nursing, social work, and medical psychology.

Louis Jolyon West, M.D., 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, kidney function and disease, neurology, physical therapy, and prosthetics. Fellowships are available through the participating divisions. Much of the work involves participation by basic as well as medical scientists.

Eugene V. Barnett, 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, comparative studies, and, under an institutional grant, research and curriculum development in manpower problems. Research staff members of the Institute are usually drawn from the regular faculties of the Graduate School of Management, 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, dynamic

and combinatorial programming and of simulation are 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 Management, the Institute staff is interdisciplinary. Overall policy guidance is provided by an Advisory Committee representing the departments of Economics, Engineering, Law, Management, 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.

Director To Be Appointed

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, history, 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 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.

Mantle 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, Biology, 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 is a research and teaching facility of the School of Medicine. Its program is broadly interdisciplinary, directed to solution of clinical and basic problems in neurology. While study encompasses a broad neurological field, emphasis is on multiple sclerosis and the demyelinating process. Twelve research beds and a research outpatient clinic 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 research unit which undertakes studies involving use of large-scale or complex surveys of human populations; (2) as a specially equipped methodological laboratory which conducts experimental studies of basic survey techniques; and (3) as a service bureau for carrying out surveys for research workers. The service bureau provides such services as study design, sampling, questionnaire construction, interviewing, coding, and data processing.

Research in progress includes the Los Angeles Metropolitan Area Survey (LAMAS), a semiannual, multipurpose community survey which provides a mechanism for the analysis of urban social processes through trend and panel studies. The Center also undertakes evaluative research investigations in such areas as health, mental health, and other social action programs.

L. G. Reeder, Director

The Center for Afro-American Studies is an organized research unit committed to the interpretation and explication of the total black experience in North and South America. Primary research into economic, social, political, and intellectual processes is disseminated to other universities and various community agencies. The CAAS publishes the *Center Monograph Series* and *Professional Papers*; it sponsors the publication of *The Journal of Black Studies*. In an effort to promote systematic investigations into issues related to blacks, the Center provides small research grants to faculty-students clusters. Special topics symposia and lectures are offered during the academic year. It participates in the Institute of American Cultures which administers the Ford Grant for ethnic studies. The Center conducts cultural events as a forum and outlet for contemporary black art and literature.

Arthur L. Smith, Director

The American Indian Studies Center acts as an educational catalyst in a variety of ways. It encourages new programs of study, promotes faculty development and systematic research, and develops library materials and curricula related to native American studies. In addition, the Program is involved with cultural activities of the Indian community and sponsors lectures, symposia, conferences, and workshops relevant to native American development. Special emphasis is upon coordinating the educational needs of the native American students with the University and the community.

A. F. Purley, Director

The Asian American Studies Center seeks to provide a deeper understanding of a particular area of study by the development of related human and material resources. It promotes the systematic development of material resources related to Asian American studies through an aggressive library acquisitions program, coordinated interdisciplinary research, and a broad publications program. Human resources are nurtured by vigorous curriculum development efforts, and courses have been designed with degree-granting programs at both the undergraduate and graduate levels. The Center supports and encourages promising graduate students and postdoctoral scholars to pursue their interests in this vital field of study, as well as sponsoring a variety of conferences, lectures, symposia, and cultural events. In addition, the Center supports a wide variety of projects designed to channel the resources of the University and the fruits of the Center's other areas of activity to Asian American communities.

Harry H. L. Kitano, Acting Director

The principal objectives of the Chicano Studies Center are to initiate and support research into all areas of knowledge pertaining to the Chicano; develop new curricula and disseminate bibliographic material and information concerning the culture, history and social problems of the Chicano community; gather, interpret and publish literature related to Chicano; develop projects and programs on campus which effect changes that promote greater involvement of the Chicano community in University activities; and involve the University in the total Chicano community through Center and community sponsored educational and cultural projects.

To achieve these and related objectives, the Center supports and acts as a stimulus and resource agency for existing University departments, schools and institutes. Through its research activities it offers resources for degree programs.

The Center also publishes the journal, *Aztlan*, which focuses attention and disseminates information dealing with the socioeconomic and political anomalies as they relate to the Chicano and society. It has also founded its own library in which innovative methods of research and accessibility to major collections are being developed and which will eventually contain the largest collection of information on the Chicano in the University Library system.

Simon Gonzalez, Acting Director

The Center for African Studies provides a framework for furthering study and research on Africa involving social sciences, education, linguistics, humanities, and fine arts. The Center participates in an interdisciplinary master's degree program and in an undergraduate program in conjunction with degrees in the social sciences or African languages. Through its Research Committee the Center makes grants for research in Africa. It participates in administering the NDEA Title VI fellowship awards for the study of African languages, and offers a limited number of supplementary grants-in-aid to students both in master's and in doctoral programs whose focal point is Africa. The Center provides information to faculty and students on extramural sources of research support. It also brings Africanists to the University for lectures or as Visiting Professors or Research Associates, and sponsors interdisciplinary colloquia focused on integrating and innovative themes. Other Center activities include the publication of quarterly journals, the journal of *African Arts*, *UFAHAMU*, a student journal, and the *Studies in African Linguistics*, as well as occasional papers and books based on the interdisciplinary colloquia.

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 Latin America. 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 coordinated programs for 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 assigned to Byzantine studies.

William Matthews, 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 Program, 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 of Cultural History is comprised of 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 promotes 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.

Pierre P. Delougez, Director

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 Biology 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 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 also operates a biomedical cyclotron at the Center for the Health Sciences which produces isotopes and is capable of activation procedures in support of its research programs. The laboratory staff consists of about 142 scientists, technicians and supporting personnel representing many disciplines: biophysicists, biochemists, physicians, physicists, physical chemists, electron microscopists, biologists, soil scientists, plant physiologists, ecologists, and spectroscopists. Graduate students and postgraduate research programs are supervised by the staff in several fields.

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 S360 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 more than 40 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
California Institute for Cancer Research
Committee on International and
Comparative Studies

Exceptional Child Research Program
Housing, Real Estate, and
Urban Land Studies Program
Management Research Division
Oral History 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., Tuesday through Friday, Sunday 1 to 5 p.m. Closed Monday and Saturday.

Rotating exhibitions of primitive, ancient, and folk art from the collections of the Museum of Cultural History 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 faculty 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 1972-1973 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 Lebanon, the United Kingdom, Ghana and Kenya), a full academic year in the university of their choice, and some vacation travel.

The graduate program in Mexico City and Paris is for two quarters only, the undergraduate for four quarters.

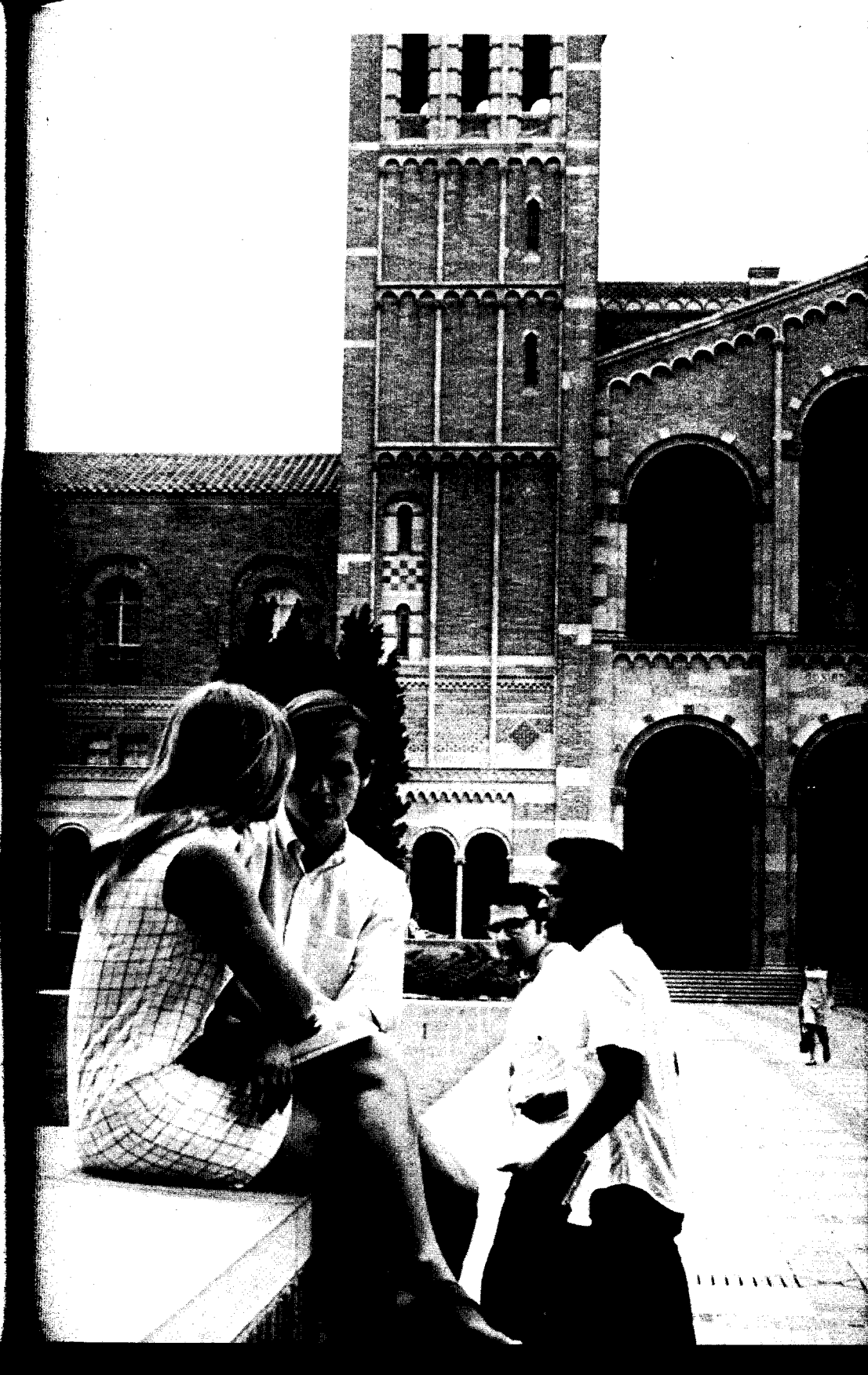
Each student will be concurrently enrolled on his home campus and in the host university and will receive full academic credit for courses satisfactorily completed.

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

Applications for 1973-1974 will be accepted from September, 1972, through January 10, 1973. Applications for Ireland and the United Kingdom must be filed no later than November 15, 1972.

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.

Graduate students may, with the approval of the departmental graduate adviser and the Dean of the Graduate Division, participate in the Education Abroad Program at the University's study centers overseas. Such students remain under the academic direction of their home campus graduate adviser but may seek assistance from the Director of the Studies Center when appropriate. Participation in the Education Abroad Program may prove especially valuable to doctoral candidates who have been advanced to candidacy and are engaged in independent study and research directed toward their dissertations. For further information, graduate students should consult the Education Abroad Office, 2221-B Bunche Hall, where applications may be obtained. After approval by the department and the Graduate Division, the application should be filed with the Education Abroad Office well in advance of the planned period of study. For Graduate Division approval, applications should be submitted to the Student and Academic Affairs Section, 1225 Murphy Hall.



Summer Sessions

In 1972 the University will conduct a self-sustaining summer quarter consisting of two summer sessions. The first session will begin on June 19; the second session will begin on July 28. 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 25 through 34 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 founded on two basic assumptions: 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 provide the student not only sound preparation for the range of University courses but also reasonable freedom in choosing his field of specialization.

Fulfilling the requirements stated below, however, may not necessarily assure admission to the campus of first choice. On some University of California campuses, limits have had to be set for the *enrollment of new students*; thus, not everyone who meets the minimum requirements can be admitted. At UCLA, for example, students who are, or who would be, college seniors are discouraged from applying for 1972-1973; Fine Arts students may apply for the Fall Quarter only.

Application for Admission

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

The opening dates for filing applications for the year 1972-73 are as follows. Fall Quarter, 1972, November 1, 1971; Winter Quarter 1973; July 1, 1972; Spring Quarter 1973, October 1, 1972.

A fee of \$20 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 Undergraduate Admissions.

If admitted he must return a statement of intention to register, together with a nonrefundable fee of \$50, which will be applied to the University Registration 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 41). 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 enrolled 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 29.

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 and then, in turn, 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 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 29.

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 (or any comparable institution), or in extension classes of college level, 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 29.

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 26). 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 Uni-

versity 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, however, to a maximum of 70 semester units or 105 quarter units.

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

In addition, 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 Undergraduate Admissions.

Subject Requirements

The same subject pattern as for California residents is required (see page 26).

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 27).

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 27).

ADMISSION TO ADVANCED STANDING

In addition to the regular admission requirements (see page 27), 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 Undergraduate Admissions early in the appropriate filing period (see page 25). 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 already in the United States on permanent immigration visas.

Proficiency in English

An applicant from another country whose mother tongue 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 is urged to take the Test of English as a Foreign Language as a preliminary means of testing his ability. Arrangements to take the test may be made by writing directly to TOEFL, Educational Testing Service, P. O. Box 899, 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 mother tongue 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 Office of Undergraduate Admissions, University of California, Los Angeles (UCLA), 405 Hilgard Avenue, Los Angeles, California 90024, 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, the Advanced Test for Graduate Study in Business, or the Miller Analogies Test.

Application

The prospective student may obtain application forms in person or by mail from Graduate Admission, Office of Academic Services, 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.

Application for admission to graduate status is limited to the Fall, Winter, and Spring Quarters of the regular academic year. Enrollment in courses in the Summer Sessions does not constitute admission to graduate status (see Enrollment in Summer Session Courses, page 33).

Applications and supporting papers should be submitted to Graduate Admissions, Office of Academic Services, on or before the following dates:

March 15th for the Fall Quarter
October 2nd 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 \$20 (nonrefundable), by check or money order payable to The Regents of the University of California.
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 for his bachelor's degree and postbaccalaureate work, 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 Graduate Admissions 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 Graduate Admissions 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 which must 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

Graduate Admissions screens all applications to determine whether or not they meet University minimum requirements for graduate status. 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 of their acceptance or rejection.

To applicants offered admission, Graduate Admissions sends with the formal notification instructions on required registration procedures.

Applicants who are offered admission with work in progress are reminded that their admission is contingent upon receipt of evidence that the work has been satisfactorily completed and a degree awarded.

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 35).

Information and applications may be obtained from the Office of Summer Sessions, Murphy Hall, University of California, Los Angeles, California 90024. The 1972 Summer Session bulletin will be available from that office beginning in March.

Renewal of Application

The offer of admission is valid for a specific quarter only. Applicants who failed to register in the quarter for which they were accepted in graduate status but who wish to reactivate their applications for a later quarter should file a Renewal of Application form. Such forms are obtained from Graduate Admissions, Office of Academic Services, 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, since records are not retained more than three years.

For applicants who have been offered admission but must enter military service before their first registration, Graduate Admissions will extend admission to a later date. Such applicants should notify Graduate Admissions immediately that they will not be able to register. Within the year after completing military service, the prospective student should inform Graduate Admissions 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 calendar quarter (three months) must file an Application For Readmission. During the academic year 1972-1973 applications for readmission are required as follows:

For Fall Quarter 1972: All students returning in the same status (graduate or undergraduate) who did not complete the Spring Quarter, 1972.

For Winter Quarter 1973: All students returning in the same status (graduate or undergraduate) who were not registered in the Fall Quarter, 1972.

For Spring Quarter 1973: All students returning in the same status (graduate or undergraduate) who neither completed the Fall Quarter, 1972, nor were registered for the Winter Quarter 1973.

In Undergraduate Status

Undergraduate students may obtain application forms from the Office of the Registrar. The completed application along with a \$20 application fee (non-refundable) and transcripts of record from other institutions, including University Extension, attended during their absence must be filed with the Registrar on or before July 15 for the Fall Quarter; November 15 for the Winter Quarter; February 15 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 Graduate Admissions, Office of Academic Services, and are submitted to that office. Filing dates are the same as those for original applications for admission to graduate status. Since some schools and departments permit readmission only in specified quarters or may stipulate earlier application deadlines, students should consult their chosen departments for additional information.

Applications for readmission should be accompanied by:

1. Application fee of \$20 (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 25.

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 47), 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 period before the beginning of classes each quarter for in-person registration. Late registration with payment of a late fee will normally be accepted during the first two weeks 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.

To be eligible to take final examinations, file theses or dissertations, or receive degrees during the summer, students must pay the filing fee unless they are registered in a Summer Session.

Health Evaluation

Each student who enters UCLA for the first time, or reenters after an absence of more than one quarter, is required to complete a Health Evaluation Form. The form should be included with the registration packet. If not, it may be obtained by calling (213) 825-2251 or writing the Student Health Service. The information is not intended to exclude students from school, but instead to better serve them while they are here, to make sure they are no hazard to themselves or other students, and to permit their activities to be adjusted so that they can make the most of their opportunities here.

Before coming to the University, all students are urged to have their own physician and dentist examine them 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.

We suggest that students be tested for tuberculosis (by a TB skin test), and syphilis (by a VDRL) within 6 months prior to enrollment here. This may be done by private physicians or public agencies. If the tests are performed, the results may be included with the Health Evaluation Form which is to be mailed directly to the Student Health Service in the envelope provided.

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 to new and reentering students 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. See Calendar, pages 5 and 6, for last day to add or drop courses.

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 independent study courses. The total number of units allowed in such courses for a letter grade is 16.

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 147-148 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.

Credit by Examination

A student who has completed a minimum of 12 units of work at this University and is in good standing may petition to receive credit by examination in a course

regularly offered by the University. He must make arrangements in advance both with the instructor who will give the examination and with the dean of his college or school, from whom the required application form may be secured.

The results of such examinations are entered upon the student's record in the same manner as are regular courses and corresponding grade points are assigned.

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. The student is entitled to receive grade points only upon approval of the appropriate dean.

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. Courses in which a grade of D or F has been earned may not be repeated on a passed/not passed basis.

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, while in good standing, 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

If a final examination is one of the regular requirements in a course, there can be no individual exemptions. Final written examinations shall not exceed three hours duration and shall be given only at the times and places established by departmental chairmen and the Registrar.

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 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.

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

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 the completion of any of the following courses with a grade of C or better or a grade of pass: Economics 10, 183; English 102, 104, 115, 118, 170, 171, 172, 173, 174, 190; History 6A, 6B, 6C, 171A, 171B, 172A, 172B, 173A, 173B, 174A, 174B, 174C, 175A, 175B, 176A, 176B, 177A, 177B, 178A, 178B, 179A, 179B, 180A, 180B, 181, 182, 183, 184, 185, 186A, 186B, 188, 189A, 189B; 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 presentation of a certificate of satisfaction of the present California requirement as administered in another collegiate institution within the State.

3. Satisfactory completion with a grade of "B" or better, of a year's course in high school of American history or American government or a one-year combination of the two effective with students entering UCLA Spring 1972 or later.

Candidates for a teaching credential, but not for a degree, must take one of the courses listed above under history or political science.

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 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 Graduate Admissions, Office of Academic Services.

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 registration 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 35) 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 will be found in the Calendar on pages 5 and 6 of this catalog.

Transcript of Record

Upon formal application to the Registrar a student may have issued on his behalf transcripts of his record on work taken at UCLA in either regular or summer sessions. A fee* of \$1 is charged for each transcript, undergraduate, graduate, or Summer Session. Transcripts required for the intercampus transfer of undergraduate students within the University 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 Campus Programs and Activities Office, 161 Kerckhoff Hall.

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

* Fees are subject to change without notice.

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 48.

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 \$100 and an Associated Student Fee of \$4.50, while all graduate students must pay each quarter an Educational Fee of \$120 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 63) or Graduate Students Association (see page 63) 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 legal 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 \$500.00 for the quarter. Legal residence is the combination of *physical presence* in California and the *intention* of making it one's permanent home, coupled with the relinquishment

* 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.

of legal residence in any other state. The student who is within the state primarily for educational purposes does not gain the status of legal resident regardless of the length of his stay in California. In general, the unmarried minor (any person under 18 years) derives legal residence from his father; or from his mother if the father is deceased; or, in the case of divorced parents, from the parent awarded legal custody by the court. The married woman derives legal residence from her husband from the date of marriage provided, however, that a California resident woman who is permanently separated from her husband or who marries a nonresident who lives in California does not lose her residence. (Government Code Section 244 and Education Code Sections 23054-23060, and Standing Order of the Regents.)

Students are reminded that presence in California for more than one year does not, in itself, entitle them to resident classification: (1) those under 19 whose parents are not California residents; (2) servicemen stationed in California who were not California residents at the time of entry into the military service; (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 nonresident tuition fee is available to the unmarried minor whose natural or adoptive 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 he registers, or is stationed outside the United States immediately after having been stationed on active duty in California. This waiver is also available to the spouse of a member of the military service of the United States with an active duty station as described above.

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 deputy who is located in the Registrar's Office. Inquiries from prospective students regarding residence requirements for tuition purposes can be made by writing to the Attorney in Residence Matters, 590 University Hall, University of California, Berkeley, California 94720. *No other University personnel are authorized to supply information relative to residence classification.*

Those classified incorrectly as residents are subject to reclassification as non-residents. Those reclassified must pay the nonresident fee. If incorrect classification results from false or concealed facts, the student shall be required to pay all back tuition fees which would have been charged as a nonresident and shall be subject to University discipline, as well as criminal prosecution, as may be determined to be appropriate. An application for a change in classification with respect to a previous quarter is not acceptable.



REFUND OF FEES†

Prior to Day One \$10	1-14 days 80%	15-21 days 60%	22-28 days 40%	29-35 days 20%	36 days and over 0%
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FOR REDUCED PROGRAMS

For the undergraduate student enrolled in less than three courses, the non-resident tuition fee is \$168 per course or the proportionate part for a fractional course. For graduate students the tuition is \$500 per quarter regardless of the number of courses undertaken. There is no reduction in Registration, Educational, Student Union or ASUCLA fees.

Other Fees

Application fee, \$20. 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.

Late registration, \$25. When permitted.

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.

† The Schedule of Refunds refers to Calendar days, beginning with the first day of instruction (Day 1).

‡ 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	300.00	The Educational Fee for graduate students is \$360.00.
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	180.00	Approximate cost.
Board and Room	1,250.00	Room and board (20 meals/week) for three quarters in a University residence hall costs approximately \$1,175 including a telephone service fee and a 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. The cost of remaining on campus during school recesses is not included in the basic residence hall contract. These supplementary room and board costs may average \$75 a year. (A refundable deposit of \$30 for breakage is also required.)
Miscellaneous	495.00	An average allowance for variable items such as clothing, transportation and parking, medicine and drugs, laundry and dry cleaning, and recreation. The cost of a round trip from home to campus is an additional expense which should be considered.
Total	\$2,550.50§	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 \$2,820 for three quarters. Students classified as nonresidents of the State must also add to their estimated budgets the tuition fee of \$1,500 to the above budget.

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

FINANCIAL AID FOR STUDENTS

Financial aid offered by UCLA include scholarships, loans, grants and work-study. One basic application suffices for all available financial aid. When the student applies for aid, a suitable combination of available funds for which he qualifies may be offered. Awards are based on financial need as determined by national financial aid criteria. **ALL APPLICANTS EXCEPT FOREIGN STUDENTS MUST SUBMIT A PARENTS' CONFIDENTIAL STATEMENT OF FINANCIAL RESOURCES.** Students may obtain this form from the UCLA Financial Aid Department, A129 Murphy Hall. Foreign students are to submit a Financial Aid Application for Students from Foreign Countries. This form is available in the Financial Aid Department.

Educational Fee Deferment

All California resident students receiving aid are offered a deferment of the Educational Fee. This deferment is made in the form of a loan, via a deferment form, which must be picked up each quarter. No interest is charged while the student is attending an institution of higher learning but 3% interest will be charged from the date he leaves school. Repayment begins nine months after 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 their sophomore year by the end of the spring quarter. Each Regent Scholar receives an honorarium of \$100 and, if he needs financial assistance, a stipend in an amount determined according to nationally recognized criteria. Special instructions for Regents Scholarship applicants are available in the Scholarship Section of the Financial Aid Department.

PRESIDENT'S AND UNIVERSITY SCHOLARSHIPS

President's and/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 offers one year and continuing awards to entering UCLA freshmen who are residents of the State. These awards range from the cost of fees and books up to \$1,500.

Selection criteria include: scholastic average (3.2 minimum), school and/or community service (employment during school year may be used in lieu of this service), promise, and financial need.

No application is required other than the standard financial aid application and statement of parents' financial resources. Award recipients are notified through the Financial Aid Department.

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.

No special applications are necessary for these scholarships. The basic application for all financial aid should be used. The campus instructions included with the Financial Aid Application list the special eligibilities which must be filled in on the basic application.

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. The Financial Aid Application for Students from Foreign Countries should be submitted directly to the Financial Aid Department by January 15.

SCHOLARSHIP APPLICATION PROCEDURE

Both continuing and entering students may obtain the necessary application forms after November 1 by mail or in person from the Financial Aid Department.

The completed application must be submitted to the Financial Aid Department 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**, which is available from the Fellowship and Assistantship Section of the Graduate Division, Room 1228 Murphy Hall.

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 Aid Department, A129 Murphy Hall.

Loans

Three types of loans may be secured through the Financial Aid Department 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 but may apply for Federally Insured Student Loans.

UNIVERSITY LOANS

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

The amount which may be borrowed is based on school-related needs. Depending upon the size of the loan, the applicant must have either one or two co-signers who meet University requirements. Co-signers' 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.

EMERGENCY LOANS

Emergency loans in small limited amounts may be obtained and are repayable 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 eligibility, 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 should be submitted by January 15 for the following academic year.

Repayments start 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

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 Aid Department (if they are a California resident). 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 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 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 Aid 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 qualified fulltime 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, and pillows. Students must furnish blankets and towels.

The residence hall rate (exclusive of recesses) is approximately \$1260 for the academic year (Fall, Winter and Spring Quarters), plus deposit 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, postmark 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.

University Married Student Apartments

The University maintains the Park Vista and Sepulveda Park apartment complexes which consist of 643 unfinished one-, two-, and three-bedroom apart-

* Rates and information subject to change.

ments, and are located on Sawtelle and Sepulveda Boulevards, approximately five miles from campus.

The basic monthly rates range from \$97.50 to \$152.50 per month. The utilities are not included in the rates.

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 assigned students must be enrolled in all quarters of the academic year, e.g., Fall, Winter and Spring Quarters.

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, and Stevens House are for women only. Room and board rates vary from approximately \$225 to \$363 per quarter.

PRIVATE RESIDENCE HALL

La Mancha Hall is coeducational and provides rooms accommodating two students, or six-person 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 \$1500-1818.

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), or the UCLA Interfraternity Council (for fraternities), care of the Dean of Students, 2224 Murphy Hall, 405 Hilgard Avenue, 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, listings cannot be mailed. 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 \$60–\$85 per month. Single and bachelor apartments usually furnished, rent for \$100 and up. Depending upon whether the apartment is furnished or unfurnished, as well as the location, rental prices for 1- and 2-bedroom apartments, \$160 and up. Rental prices for houses are appreciably higher.

Students who are not boarding by the month can obtain moderately priced meals at a UCLA residence hall, 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 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, the nearest being approximately five miles from campus.

TRANSPORTATION TO CAMPUS AND PARKING

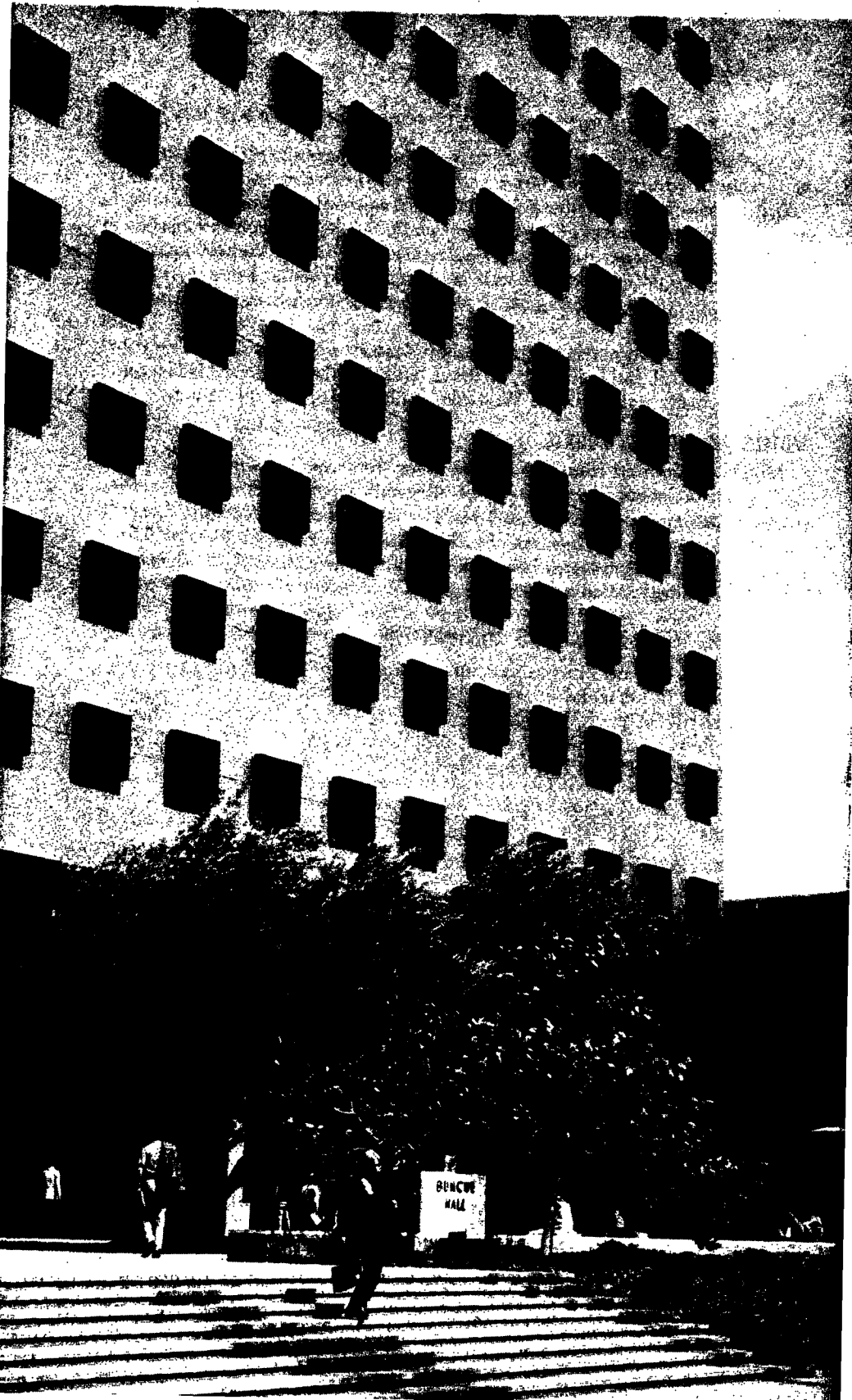
Student parking facilities on campus are limited and are subject to a parking fee. Since the full demand cannot be met at the present time, the use of public transportation, car pools, bicycles, and motor scooters is encouraged whenever possible. Please contact the Southern California Rapid Transit District 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 medical, surgical, and complete 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 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 registration 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 several other items. No additional charges are made for consultations with specialists, X-ray examinations, laboratory tests, hospital care, major or minor surgery, 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 few days between quarters. A continuing student who does not register for any quarter is ordinarily not eligible for any service during that quarter; he may, however, elect to become eligible for regular service during the summer by paying an optional health service fee. Unregistered graduate students actively working toward a degree and unregistered foreign students whose close identification with the University is certified by the Dean of Foreign Students, are extended the same privileges during any quarter. Unregistered continuing students who do not wish to take out coverage for the whole quarter may pay for single visits or procedures on a fee-for-service basis.

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. However any student may apply directly, without referral, to the Dental Clinic or the Psychiatric Clinic. (c) Clinical Laboratory, X-Ray, pharmacy, and other ancillary services. (d) An immunization station which operates from 8:00 a.m. until 4:30 p.m. Monday through Friday; no appointment is 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 \$7.50 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.

Contraceptive services are available through the Conception Counseling and Education Clinic (CCEC), a joint project of the Family Planning Clinic of the Medical School's Department of Obstetrics and Gynecology and of the Student Health Service. Educational sessions, which are free of charge to any student, male or female, who wishes to learn more about contraception, are held in the student lounge of the Center for the Health Sciences. Clinical sessions, supported by the fees of the students who attend them, are conducted in the gynecology suite of the Student Health Service Dispensary. To attend a clinical session, a student must fulfill one of the following criteria: (1) be at least 18 years of age, (2) be married, or have been married, (3) bring written consent from parent or guardian, or (4) certify that she is living apart from her parents and managing her own financial affairs.

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 three 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.

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. *Hospital care under Student Health Service auspices is limited to 3 days in any one quarter*; the student is financially responsible for any further care. 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 Student Health Service. 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, con-

cerns, 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 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 publishes a booklet, *What to Expect of Counsel*, which can be helpful. Copies are obtainable at the Center or at the Campus Services Center in the main lobby of Ackerman Union.

LEARNING SKILLS CENTER

The services provided by the Center (Social Welfare 271) are designed for the voluntary use of any regularly enrolled student. They offer individual and group programs designed to assist students in their development of reading, writing, listening, and study skills and habits appropriate to the demands of their University studies. The staff is composed of professionals from a variety of academic disciplines familiar with the learning needs of college students. The services are not part of an administrative units such as an academic college or department. There is no charge for these services.

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 421 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 an education at civil institutions 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 438 for details of the program.

Air Force Reserve Officers' Training Corps

Air Force ROTC, through its Aerospace Studies offerings, enables students to develop, demonstrate, and apply the knowledge and leadership qualities requisite for officers commissions in the U. S. Air Force. Students who demonstrate dedication to their assignments, who willingly accept responsibility, who think critically and who have the ability to communicate with clarity and precision will, upon completing the curriculum and graduating from the University, receive an officer's commission.

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 to students who continue to be eligible for this 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.

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 the 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 a number of governing bodies in ASUCLA. These bodies 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 and xerographic services, photographic center, student health insurance, and daily newspaper. All ASUCLA activities and services are offered free or at a nominal fee to any UCLA student.

ASUCLA is under the direction of the ASUCLA Board of Control, comprised of six students, two administration representatives, one faculty and one alumni representative.

CAMPUS PROGRAMS AND ACTIVITIES OFFICE

There are currently over 300 registered organizations at UCLA representing a wide range of student, faculty and staff interests in addition to a variety of student-government-sponsored programs and activities.

The Campus Programs and Activities Office (Kerckhoff 161, ext. 57041) under the Vice Chancellor for Student and Campus Affairs advises such groups in the development, implementation and evaluation of their programs and activities. It is also the responsibility of this office to administer University regulations related to the non-class use of University facilities. An organization must first register with the CPAO; programs and activities sponsored by that organization also receive program approval here. The scheduling and facility use approval is then obtained from Campus Activities Service Office (Royce Hall 130). Ideas for new programs and activities are encouraged by the CPAO where a cooperative relationship between students, faculty and staff prevails. Individuals and groups are encouraged to come in at any time to discuss concepts, plans or problems.

EXPO (Kerckhoff 176, Ext. 57041), the Extramural Programs and Opportunities Center of CPAO, offers information and counseling to students to assist

them in participating in a wide variety of international, national, and local work, travel, study, service, and internship programs which offer opportunities for experiential education.

CAMPUS ACTIVITIES SERVICE OFFICE

The Campus Activities Service Office has the responsibility to administer and operate campus facilities when used by non-class activities for the UCLA community. Event, activity, and program producers in these areas are invited to avail themselves of CASO's equipment, facilities and trained personnel for room scheduling, staging, lighting, audio visual services, crowd management, literature posting, etc.

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 registration 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-six 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-eight 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, informal concerts, exhibitions and art and dance classes for adults and children. An extensive aquatic program includes swim classes for children and adults.

PHYSICAL EDUCATION

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 LeConte Avenues, is the University Religious Conference, where official representatives of the Baptist, Catholic, United Church of Christ, Disciple, Episcopal, Jewish, Latter Day Saints, Lutheran, Methodist and Presbyterian denominations have membership and 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; for Lutherans at 900 Hilgard and 10915 Strathmore; and for the Latter Day Saints at 856 Hilgard. The Christian Science Organization reading room and headquarters are located at 500 Hilgard Avenue. The Y.W.C.A. occupies its own building at 574 Hilgard Avenue.

In these facilities are held worship services, 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

Career Planning and Placement. A staff of career counselors is available for consultation about specific career opportunities and planning a job search, as well as for 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 of the University.

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. In addition, representatives of various

universities schedule interviews with graduating students interested in studying law, business, journalism and other graduate professional disciplines. To participate in the Campus Interview Program, contact should be made with the Placement and Career Planning Center, preferably a year prior to completion of studies.

The Placement and Career Planning Center also receives numerous listings of full-time career opportunities from many organizations that do not participate in the Campus Interview Program. Students and alumni are referred directly to the employers' offices to investigate these opportunities.

The Center maintains a career resources library which includes occupational briefs and information, graduate school catalogs, and related items of interest to students planning their career alternatives.

Part-Time and Temporary Employment. The Placement and Career Planning Center provides a job listing and referral system for currently enrolled students and their spouses who are seeking part-time, temporary, or vacation employment. Jobs are available in the clerical, sales, food service, and unskilled labor areas. Career-related opportunities in business, engineering, science, recreation, and education also are available. In addition, the Center maintains files of qualified students who are interested in tutoring, babysitting, and temporary unskilled jobs. Listings of room and board in private homes in exchange for work and commission sales opportunities are also maintained.

OFFICE OF EDUCATIONAL CAREER SERVICES

The Office of Educational Career Services is a source of information and counsel to persons from all fields of academic study who are interested in careers in education. The office serves graduates, students and former students seeking positions in universities, colleges, community colleges, secondary and elementary schools throughout the world, both public and private. The office is also a liaison department with employers of educators, not only in educational institutions, but in government, business and industry, in helping them locate qualified UCLA candidates. Services are provided free of charge, both to students and graduates of the University of California and to educational employers.

The office provides current lists of educational openings, educational careers counseling, professional file service to accredited educational institutions, a resource library and video-tape utilization for candidates. Various types of developmental programs are sponsored by the office, such as: educational internships, symposia, and training and orientation activities. Communications should be addressed to the Office of Educational Career Services, 4223 Math Sciences.

UNIVERSITY POLICIES COMMISSION

The University Policies Commission is an innovative function which merges the representation of students, faculty, staff, and administration in gathering information and making recommendations to officials responsible for decision making concerning University policy. The Commission is composed of three students, three faculty members, three administrators, three members of the nonacademic staff, and the Ombudsman.

OMBUDSMAN

The purpose of the Ombudsman office is to seek to resolve personal grievances of members of the university community emerging from policy, practices, and/or personalities. As an independent agent with investigatory powers, the Ombudsman accepts grievances only after the grievant has tried to resolve his problems through regular channels and when there is evidence that adverse decisions are questionable.

The Ombudsman also serves on the University Policies Commission which reviews and recommends policy changes.

The office is located in Kinsey Hall, Room 284, (phone 825-7627) and is open to all University-related persons.

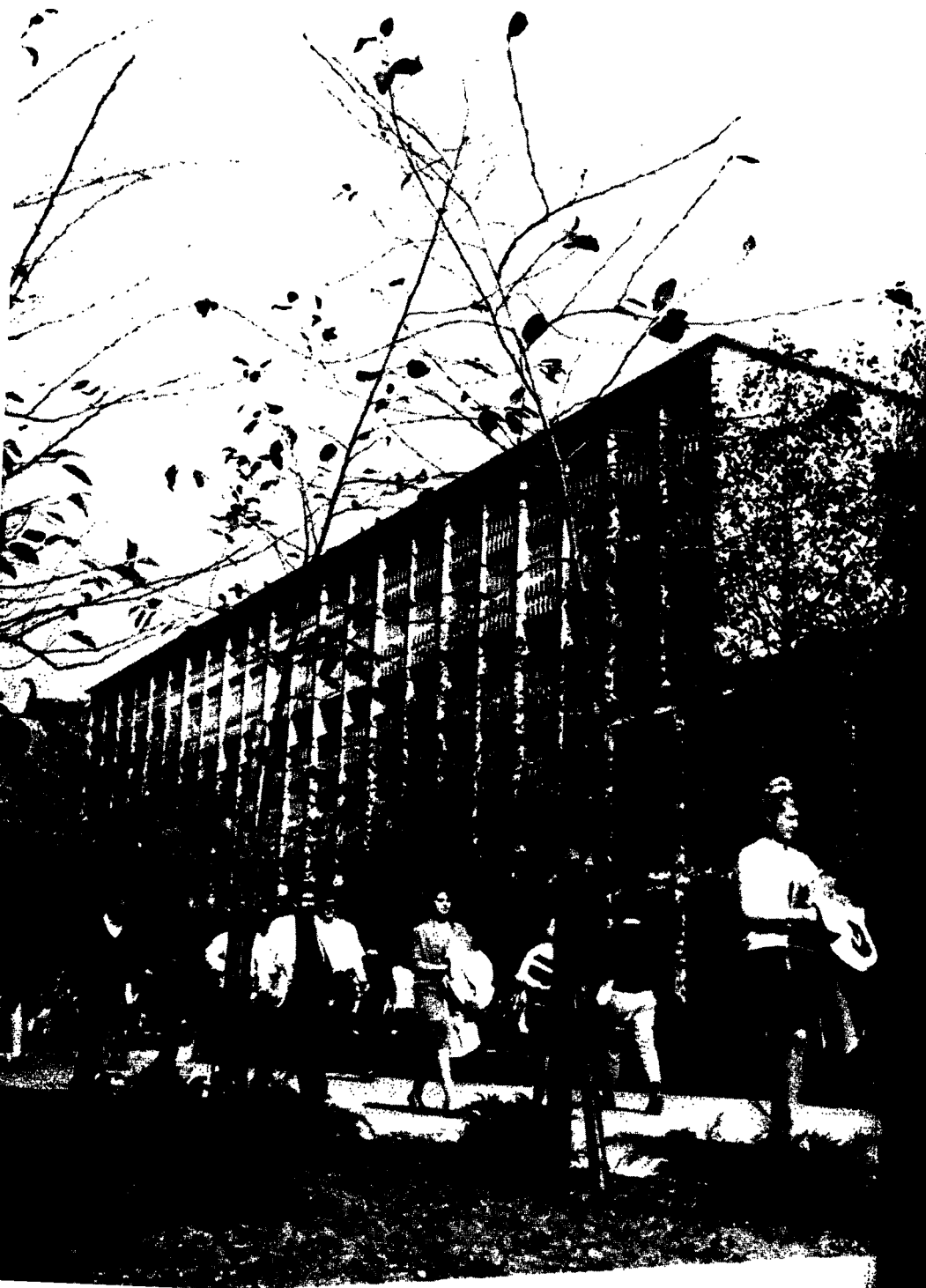
CAMPUS SERVICE CENTER

The Services Center is a focal point for information of any nature regarding the campus community. Assistance is given by phone, in person, or by specific referral. The Center is located in the main lobby of Ackerman Union. Phone 825-3740.

CAMPUS LIFE STUDIES

As a good business has a research department there is, within the office of the Vice-Chancellor for Student and Campus Affairs, a service research division known as Campus Life Studies.

The central thrust of this division is inquiry into the ever shifting characteristics of the student population with special attention to needs, interest, and attitudes.



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 cultur  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 may apply for admission to this program, on forms supplied by the Office of the Dean, after having completed either (a) 16 or more graded units at UCLA with a cumulative grade-point average not less than 3.25; or (b) 36 or more graded units in consecutive quarters with a grade-point average for those quarters of not less than 3.25. Continued superior academic achievement is requisite for remaining in the program.

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. For the possibility of concurrently working for both undergraduate and graduate degrees (Departmental Scholar), see page 151.

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 graded courses 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 $\frac{1}{2}$ 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 71 through 75 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. Of the last 45 units completed for the bachelor's degree, 35 must be earned in residence in the College of Letters and Science on this campus. Not more than 18 of the 35 units 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 41 of this bulletin.

B. American History and Institutions. See pages 42 through 43 of this bulletin.

C. Foreign Language

The College of Letters and Science does not have a college-wide requirement for foreign language. Students should consult this catalog and departments or committees administering curricula concerning the requirement of specific majors. Credit will not be allowed for completing a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition.

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

English 1 (or Speech 1 taken at Los Angeles or Berkeley only) with a grade of "C" or better. A course in English composition taken for a Pass grade does not satisfy this requirement. 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.

This requirement may also be satisfied by completing the sequence of five courses: English 2, English 10A, 10B, 10C, and English 140. If a student who satisfies the requirement in this way is not majoring in the Division of Humanities, these courses may also be counted toward fulfillment of the breadth requirements.

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.

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

* To meet a breadth requirement a transfer student may offer a 3-unit semester course which parallels a quarter course at UCLA. One-unit semester courses are not acceptable for application to these requirements. English 1 may be applied on the Humanities requirement if Speech 1 has been used to satisfy the D requirement.

Humanities

African Languages
Ancient Near Eastern
Civilizations
Arabic
Chinese
Classics
English
English-Greek
English-Latin
French
German
Greek
Hebrew
Indo-European Studies
Italian
Japanese
Latin
Linguistics
Music
Near Eastern Studies
Philosophy
Portuguese
Scandinavian Languages
Slavic Languages

**Speech
Spanish****Physical Sciences**

Astronomy
Biochemistry
Chemistry
Cybernetics
Earth Physics and
Exploration Geophysics
General Chemistry
General Physics
Geology
Mathematics
Mathematics-Applied
Science
Mathematics-Computer
Science
Mathematics-Systems
Science
Meteorology
Physical Sciences-
Mathematics
Physics
Planetary and Space
Science

Social Sciences

Anthropology
Business-Economics (for
Business Teachers)
Economics *East Asian Studies*
Geography
Geography-Ecosystems
History
Latin American Studies
Political Science
Public Service
➤ Elementary Teachers
Social Sciences for
East Asian Studies
Sociology

Life Sciences

Bacteriology
Biology
Botany
Physical Education
Psychobiology
Psychology
Quantitative Psychology
Zoology

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, Engineering 10 and 20, Geology (except Geology 115, 116, 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, 139A-139B, 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, 139A-139B, 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 30A, 50, 51, 52, 53, 54, 101A-101B-101C, 103A-103C, 104A-104D, 105A-105D, 106A-106B-106C, 108A-108B, 109A-109D, 110A-110D, 112A-112B, 114A-114B-114C, 115A-115B-115C, 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, 120, 121, 122, 123, 124, 125, 130, 131A-131B, 132A-132B, 133, 134, 135A-135B-135C, 136, 137, 138, 139, 140A-140B-140C, 141A-141B, 142, 143A-143B, M144, 145, 146, 147, 150A-150B-150C, M154A-154B.

Theater Arts 5A-5B-5C, 102A-102B-102D, 103A-103B, 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, each course applies strictly according to its major division (see page 72). Exceptions noted under Plan A do not apply (e.g. Anthropology 11 is considered a social science when applied on Plan B).

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	English 1, 2 (Grades 4 and 5 only).*
Foreign Language	Fulfills the C 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 1C. If a student takes the equivalent UCLA course, a deduction of unit credit for such duplication will be made prior to graduation.

Credit by Examination

Within the College of Letters and Science, eligibility for credit by examination is for the most part limited to students who have established their superiority by being approved as Departmental Scholars, or by their participation in a departmental honors program, or by their admission to the College Honors Program. A student not eligible by any of these criteria may nevertheless petition to the Dean; his petition should make clear his superiority at least in the area of the course in question and in related work. Petitions for credit by examination are available only through an appointment with a College counselor.

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

* Grade 3 in the English examination provides credit for two courses in humanities.

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. At least one half of the upper division courses required must be in departments that offer a departmental major in the College of Letters and Science. 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.

Students in good standing are sometimes permitted to have a double major, consisting of two departmental majors, provided they can be completed well within the maximum limit of 208 units. Courses used to satisfy the requirements for the principal major may also be used to satisfy the requirements for the secondary one.

Each student will designate one of his majors as the principal one, in order to identify his division for the purpose of satisfying the breadth requirements. Courses outside the department of his principal major required in preparation for that major may be used to satisfy the breadth requirements. Courses used to meet the requirements of the secondary major (including preparation for the major) may be used to satisfy the breadth requirements under Plan A, but not to satisfy the requirement of a seven-course sequence under Plan B. They may be used to satisfy the other one or two courses under Plan B.

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 petition the Dean of the College for a change of major. Because of enrollment limitations, departments will be consulted before approval can be given. Consideration of the 208-unit limit may prevent a late change of major. No change of major will be permitted after the opening of the students' 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.

African Languages	French	Meteorology
Ancient Near Eastern Civilizations	General Chemistry*	Music
Anthropology	General Physics	Philosophy
Arabic	Geography	Physical Education*
Astronomy	Geography-Ecosystems	Physics*
Bacteriology	Geology*	Planetary and Space Science
Biochemistry*	German	Political Science
Biology	Greek	Portuguese
Botany	Hebrew	Psychobiology
Business-Economics (For Business Teachers)	History	Psychology, General
Chemistry*	Italian	Quantitative Psychology
Chinese	Japanese	Scandinavian Languages
Classics	Latin	Slavic Languages
Economics	Linguistics	Sociology
English	Mathematics	Spanish
	Mathematics-Applied Science	Speech
		Zoology

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.

Cybernetics	Mathematics-Computer Science
Earth Physics and Exploration Geophysics	Mathematics-System Science
East Asian Studies	Near Eastern Studies
English-Greek	Physical Sciences-Mathematics
English-Latin	Public Service
Indo-European Studies	Social Sciences for Elementary Teachers
Latin American Studies	

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

Special Program in African Studies

Committee in Charge. E. A. Alpers (Chairman), J. D. Bowen, W. Goldschmidt, P. M. Schachter.

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

* Leading to the degree of Bachelor of Science.

student completing this special program will receive a degree with a major in his chosen discipline and specialization in African Studies.

Preparation. The introductory courses listed here in three of the six following departments: Anthropology 5A and 5C; Economics 1 and 2, or 100; Geography 1A-1B; History 1A-1B-1C or 100; 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 departmental major in the social sciences, humanities or arts. In addition, he is required to take a course related to Africa in each of four departments, one of which must be African Languages 190. African Languages 190 and one of the other three required upper division courses related to Africa may, however, be replaced by a three-quarter sequence of any 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, 2, and 3. 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 or 5.

Upper Division. The political science major should be completed as follows: Political Science 101; any four upper division courses in Field II, International Relations; any four upper division courses in Field IV, Comparative Government.

Other social sciences courses required: 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, 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, Japanese, Russian and Spanish, are the languages of widest career utility in international affairs.

Area Focus. Students are advised but not required to concentrate their politi-

cal 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 Cybernetics

Committee in Charge. J. W. Carlyle, E. C. Carterette, A. Grinnell, P. Ladefoged, W. R. Adey, and J. J. Vidal.

This major provides an introduction to cybernetics (general theoretical foundations for information processing, communication, control, and system analysis) accompanied by complementary studies of models and phenomena, with particular attention to those arising in the life sciences. The major is appropriate preparation for technical employment in cybernetics, and in its roles in biological and health sciences, or for graduate or professional studies emphasizing interdisciplinary research in these fields. Courses in technical cybernetics for the major are offered by the Department of System Science (School of Engineering and Applied Science), and accompanying course-work is taken in Psychology, Biology, Linguistics, Mathematics, the School of Medicine, and related disciplines. Options are arranged within the major as follows: (1) cybernetics and linguistics; (2) mathematical cybernetics; (3) cybernetics and psychology, emphasizing physiological psychology, perception and learning; (4) cybernetics and biology, emphasizing physiology, cell biology, and the nervous system; (5) cybernetics and premedical studies.

Preparation for the Major. Required in each option: Chemistry 1A-1B-1C, 4A-4B; Engineering 10 or equivalent experience with rudiments of computer programming; Mathematics 11A-11B-11C (or 3A-3B-3C), 12A; Physics 7A-7B or 6A-6B. In addition, in options (1), (2), (3): Mathematics 12B-12C; Psychology 10. In option (4): Chemistry 4C, 6A-6B-6C; Physics 6C or 7C-7D. In option (5): Biology 1A-1B; Chemistry 6A-6B; Physics 6C. In general, students in each option are encouraged to complete as much as possible of the series Chemistry 4 and 6, Mathematics 12, and Physics 7 or 6 at some time during their four-year undergraduate program. Also recommended: Mathematics 60.

The Major. Selections are to be made from the Major List below, as follows: In each option, at least half of the selections must be made from those courses in the List which are offered by departments of the College of Letters and Science. Required in each option: Engineering 120A, 121C, 128D; Biology 189A-189B (or one life-science course selected from the Major List, for those who have taken Biology 1A-1B); Biology 111. In option (1): Linguistics 100, 103, 120B, 145; Engineering 127B; three additional courses in the List. In option (2): Mathematics 130A and two of 110A, 114, 115, 131A, 132; two of Engineering 120B, 120C, 127B, 128A; one of Biomathematics 110, Psychology 150, Biology 184; two additional courses. In option (3): Psychology 115, 116, 122, 150; Engineering 127B; three additional courses. In option (4): Biology 158, 166 (or Physiology 100), 157A; two from Biological Chemistry, Chemistry, or Biology; Engineering 120B or 120C; two additional courses. In option (5): Biology M132, 138; two of Engineering 100D, 128L, 129A; four additional courses.

Major List. Bacteriology 112A, 112B; Biological Chemistry 101A, 101B, 101C;

Biology 111, 120, 122, 125, 129, 130, M132, 138, 144, 145A-145D, 146, 154, 158, 159, 161, 163, 171, 172, 173, 177, 184, 189A-189B; Biomathematics 110; Chemistry 110A, 110B, 131 (% course), 133A, 153, 154; Engineering 110D, 120A, 120B, 120C, 121C, 122A, 122B, 127B, 128A, 128D, 128L, 129A; Linguistics 100, 103, 120A, 120B, 125, 145, 180; Mathematics 110A, 112A, 113, 114, 115, 121, 130A, 130B, 131A, 131B, 132, 140A, 140B, 144, 150B, 152A, 152B; Physiology 100 (1½ courses); Psychology 111, 116, 118A, 118B, 118C, 120, 121, 122, 123, 150, and the half-courses 119A, 119B; Public Health 114A, 114B, 114C, 147, 160B, 160C. Selections from the list must form a coherent group approved by the Committee or the student's major adviser, who will assist in identifying alternates to stated prerequisites.

Major in Earth Physics and Exploration Geophysics

Committee in Charge. R. L. Shreve (Chairman), J. M. Christie, W. M. Kaula.

This major is designed to provide training in the physical sciences that are basic to geophysics. The requirements of geophysical companies and the demands of educational and research institutions indicate the desirability of broad training in the physical sciences for those who intend to enter either applied geophysics or earth physics. Two options are provided below: the first is designed for students interested in exploration geophysics, the second for those intending to undertake graduate study in geology, geophysics, planetary physics, or space science.

OPTION I. EXPLORATION GEOPHYSICS

Preparation for the Major. Chemistry 1A-1B-1C; Geology M1; Mathematics 11A-11B-11C, 12A-12B-12C; Physics 7A-7B-7C-7D.

The Major. Required: Geology 111A, 111B, 111C, M136; Physics 105A, 110A, 114; Physics 131A or Mathematics 145A.

Major electives: At least 5 courses selected from: Chemistry 110A-110B; Geology 103, 112, 137, 139; Mathematics 140A-140B-140C, 152A-152B; Physics 105B, 110B, 115A, 116; Physics 131B or Mathematics 145B; Planetary and Space Science 101. A summer of appropriate employment 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. Required: Physics 105A-105B, 110A, 112A; Physics 131A-131B or Mathematics 145A-145B; Planetary and Space Science 101. *Major electives:* At least 6 courses selected from: Astronomy 101, 103A-103B; Chemistry 110A-110B; Geology 111A-111B-111C; Mathematics 140A-140B-140C, 150A-150B-150C, 152A-152B; Meteorology M109A-M109B, 143; Physics 108, 110B, 112B, 114, 115A-115B-115C, M122, 140, 180B-180C-180D-180E.

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

Major in East Asian Studies

Committee in Charge. D. M. Farquhar (Chairman), R. D. Baum, B. Befu, L. C. Hirata, H. H. Kitano, G. N. Levine.

This major is designed to meet the needs of students who (1) are seeking a general education on East Asia; (2) are planning careers which will necessitate knowledge of an/or residence in East Asia; and (3) desire a background in East Asian Studies as a basis for research and/or community work related to the Asian American.

Preparation for the Major. History 9B-9C; Oriental Languages 1A-1B-1C or Oriental Languages 9A-9B-9C or a parallel Cantonese sequence. Students planning to pursue classical Chinese in the Major will need Oriental Languages 13A-13B-13C in addition to the above courses.

The Major. This consists of four parts:

1. Oriental Languages 101A-101B-101C; or Oriental Languages 113A-113B and an additional upper-division course in classical Chinese; or Oriental Languages 109A-109B-109C; or a parallel Cantonese sequence.

2. Four courses selected from the following: Anthropology 103C; Geography 186; History 191A-191B-191C, 193, 195A-195B-195C; Political Science 135, 136, 159, 160.

3. Seven courses selected from the following: any courses in the social sciences listed above under "2" not being used to satisfy that requirement; any upper division courses in the Department of Oriental Languages not being used to satisfy other parts of the Major requirements; any new upper division courses relevant to East Asian or Asian American studies (including no more than three CED and CSES courses) which may be approved by the Executive Committee of the College on the recommendation of the Advisory Committee; Art 114B, Art 114C, Art 115B, Art 115C; Dance 140B, 145; * Music 140A, 147.*

4. The prescribed courses in one of the following areas (courses offered to satisfy this requirement will not also satisfy other parts of the Major requirements): (a) *Language*: Oriental Languages 121A-121B and two other upper-division courses in Chinese; or Oriental Languages 119A-119B and two other upper-division courses in Japanese. (b) *Archaeology*: Any four of the following: Oriental Languages 170A-170B-170C; Anthropology 109A*-109B,* 175A*-175B.* (c) *Geography*: Geography 120, 150, 186; and an additional upper-division Geography course. (d) *History*: Four upper-division or graduate courses in East Asian or Southeast Asian history (History 191A-191B-191C, 193, 195A-195B-195C, 196C-196D, 197 when in the East Asian field, 201B, 212, 214). Recommended: four upper-division courses in History other than Asian history; 1 year of French or German. (e) *Linguistics*: Linguistics 100, 103, and two courses selected from the following: Linguistics 120A-120B; Oriental Languages 175A-175B. (f) *Political Science*: Political Science 115,* 150 and two courses selected from the following: Political Science 135, 136, 159, 160. (g) *Sociology*: Sociology 124 and three courses selected from the following: Sociology 113, 126, 151, 154 (Sociology 1 or 101 is prerequisite to all of these courses).

* Courses so marked have prerequisites which are not included among the courses mentioned here. Consult the UCLA GENERAL CATALOG.

Major in Indo-European Studies

Committee in Charge. R. Anttila (Chairman), H. Birnbaum, P. K. Ford, M. Gimbutas, J. Puhvel, H. Scharfe.

Preparation for the Major. Three courses of Latin; three courses of Greek; three courses of German or Russian.

The Major. Required: (1) Indo-European Studies 131, 132, 140, M150, Oriental Languages 160, 161, 162; (2) two courses chosen from English 216A, 217A, Oriental Languages 214A, M222A (same as Persian M222A), Persian 230A (Near Eastern Languages); (3) Greek 101A and 101B; (4) one course chosen from Anthropology 109A-109B, 123A-123B, Linguistics 100; (5) one course chosen from English M111D (same as Folklore M122), 111E, Linguistics 110, 120A, 120B, Oriental Languages 166, 167, Persian 169 (Near Eastern Languages), Slavic M179, (same as Folklore M126).

Major in Latin American Studies

Committee in Charge. C. W. Meighan (Chairman), C. F. Bennett, J. E. Englekirk, S. B. Kaufman, J. Wilkie.

Preparation for the Major. Economics 1-2, or 100; History 8; Spanish 1-5, 25, or Portuguese 1-3, 25 (students are encouraged to study both languages).

The Major. Twelve courses, with two in each of the following disciplines: Anthropology 105A, 105B, 106C, or Special Courses; Economics 110, 111, 112, or Special Courses; Geography 181, 182, or Special Courses; History 162A, 162B, 163B, 166, 169, or Special Courses; Political Science 131, 163A-163B, or Special Courses; Spanish and Portuguese Literature, two courses in one language chosen from Spanish or Portuguese 121A, 121B, and Special Courses (see the Center regarding Special Courses). *Major Concentration:* Three additional courses chosen from the Center's List of Approved Latin American Courses (see p. 368 for a partial listing of courses; see the undergraduate adviser for complete list) in one of the above core disciplines. *Major Electives:* Three additional courses (see the Center's List of Approved Latin American Courses) or from the general theory and method courses in the various disciplines. *Study in Latin America:* Students are encouraged to spend up to one year in Latin America either (a) studying with an education abroad program or in a Latin American university; or (b) doing field research or work in a development agency. Full credit will be granted. *Course Limitations:* No student may take more than 16 units of 199 for letter grade credit nor more than 8 units in any single term.

Major in Mathematics-Computer Science

Committee in Charge. P. C. Curtis (Chairman), D. Cantor, D. Krupp, D. Martin, J. McLaurin, R. Nilsen, D. Sanchez.

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, com-

puter 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, 20.

The Major. Mathematics 110A, 115, 130A, 150B or 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, 126C. Credit will not be allowed toward the major for both Mathematics 140B and Engineering 124A.

Students with 92 units or more as of September 1971 are exempt from the course 20 requirement.

Students with substantial knowledge of programming may be exempted from the Engineering 10, 20 requirement upon petition to Computer Science Department.

Students with credit for a lower division course in differential equations may be exempted from 130A requirement. An upper division mathematics elective must be substituted in this case.

Students transferring into the Mathematics-Computer Science program at the upper division level with preparation in mathematics or physics different from that listed above should consult a mathematics-computer science adviser.

Major in Mathematics-System Science

Committee in Charge. S. T. Hu (Chairman), J. Carlyle, S. Greibach, M. Hestenes, R. Jennrich, J. Ralston.

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. S. J. Shaw (Chairman), J. Eckmann, G. Sabagh, A. K. Sanjian.

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; 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 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. M. Chester, M. A. El-Sayed, P. Johnson, 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 M3G, M3M; Physics 7A-7B-7C-7D.

The Major. Astronomy 101; Chemistry 110A; Education 130 and either 100 or M108 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).

Psychology-Mathematics

Students currently enrolled as Psychology-Mathematics Majors must graduate by June, 1975. No new students will be admitted to this program. Interested students should see the Quantitative Psychology Major or the Mathematics-Applied Science Major. All questions and petitions for the Psychology-Mathematics major should be referred to the Psychology Advising Office, Franz Hall 1531.

Major in Public Service

The curriculum in this major, which has been a four-year program leading to the Bachelor of Arts in Public Service and preparing students to work in government, in quasi-governmental agencies, and in community organizations related to public service, is being revised. Until a revised curriculum has been approved, no new students will be accepted into the major. No changes will be made in the curriculum which will impose any new requirements upon students already in the major.

As soon as the new major requirements and options have been approved, information about them will be available at the information window of the College office, 1312 Murphy Hall.

Major in Social Sciences for Elementary Teachers

Committee in Charge. R. A. Wilson (Chairman), G. S. Dunbar, W. H. Dutton, C. W. Gordon, F. Rabinovitz.

This major is currently under review because of recent State legislation governing the elementary teaching credential. No admission or transfer to the major will be permitted until at least the Winter quarter of 1973 and perhaps later. Students currently enrolled at UCLA in this major should consult the College of Letters and Science concerning requirements. If the major is reinstated, it will probably be substantially altered. Students are advised to complete a suitable departmental major as the best means of proceeding toward a teaching credential. For further information concerning credential programs see the UCLA ANNOUNCEMENT OF THE GRADUATE SCHOOL OF EDUCATION.

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.

Social Science Emphasis (General Criminology)

Required: Subject A; American History and Institutions; One course from the following: Mathematics 50, Psychology 41.

Other courses should be chosen from the natural sciences, the social sciences and the humanities. It is, however, permissible for the student to take courses in only the social science area, provided that they be from more than one department.

Recommended: English 1, 2 or other reading and composition course (strongly recommended); Psychology 10 and an upper division course in personality, social pathology or development; Political Science 1 or 2, or upper division courses in American government and comparative government; One course from the following: Sociology 111, 125; Political Science 114; Two courses from Sociology 1 or 101, and other sociology courses; Four courses in the natural sciences; Four courses in the humanities.

Natural Science Emphasis (Criminalistics)

Required: Subject A; American History and Institutions; Chemistry 1A-1B-1C, 4A-4B, 6A-6B; Biology 2; Physics 6A-6B-6C (requires Math 3A-3B-3C); Mathematics 3A or 11A; Statistics 20 will be taken at Berkeley.

Recommended: English 1, 2 or other reading and composition course; Two courses chosen from Sociology 1 or 101 and other sociology courses; Psychology 10 or upper division course in personality, social pathology or development; One course in humanities.

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. Ann Beech, 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.

* School of Dentistry, page 105.

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 3A, 3AL, 3B, 3BL, 3C, 3CL; Biology 1A-1B, 138 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).

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

† Other dental school 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.

physics constitute the minimum requirements for acceptance to the School (see page 113. 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 1 (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.

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 pages 125-126.

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.

High school preparation for premedical studies at the University should include: English, three units; United States history, one unit; mathematics, three and one-half units; chemistry, one unit; physics, one unit; biology, one unit; foreign language (preferably French or German), two units. It is desirable that a course in freehand drawing be taken in high school.

Usually the following courses are required for admission to the UCLA medical school: English 1, 2; Chemistry 1A-1B-1C, 4A-4B, 6A-6B, (Chemistry 4C, 6C recommended); Physics 3A-3AL-3B-3BL-3C-3CL; Biology 1A-1B; M132, 138. Courses in physical chemistry and calculus are strongly recommended. Course requirements for admission to other University of California medical schools vary slightly (e.g. UCSF requires reading knowledge of a foreign language, and only UCLA and UCSD require genetics). Requirements for admission to medical schools outside the University of California also vary somewhat so that students should consult the publication, "Medical School

Admission Requirements, USA and Canada," Association of American Medical Colleges, 1 Dupont Circle, N.W., Washington, D.C. 20036.

Prenursing Curriculum: Two Years

Committee in Charge. H. McGrane (Chairman), J. C. Liebeskind.

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) Elementary algebra and plane geometry; (4) English 1; (5) Physical sciences: Chemistry 1A-1N; M1 (or a high school course in physics with laboratory); (6) Life sciences: Bacteriology 6, 10 or 100A; Biology 1A-1B; Psychology 15; (7) Social sciences: Anthropology 22 or 5A; Psychology 10; Sociology 1 or 101; (8) Breadth requirements, Plan A or Plan B.

Preoptometry Curriculum: Two Years

Adviser: Frederick Crescitelli, Department of Biology.

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 3A, 3AL, 3B, 3BL, 3C, 3CL; (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 admis-

sion 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 3A, 3AL, 3B, 3BL, 3C, 3CL; (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, 5 units of physiology with laboratory, 5 units of abnormal psychology as well as satisfy the College of Letters and Science requirements.

Prepublic Health Curriculum: Two Years

Committee in Charge. L. S. Goerke (Chairman), M. J. Pickett, E. L. Rada.

The University offers a four-year program leading to the degree of Bachelor

§ 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.

of Science in public health. The prepublic health 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 Public Health.

The specific requirements for acceptance by the School of Public Health are included in the curriculum as set forth below. Students should apply for admission to the School of Public Health upon completion of 90 quarter units of this program with a C (2.00) average or better.

Curriculum Requirements. (1) Subject A; (2) American History and Institutions; (3) Foreign language (completion of course 3 or three years of one language in high school); (4) two years of high school mathematics; (5) English 1; (6) Physical sciences: Chemistry 1A-1B-1C*; Mathematics 1 or 3A; (7) Life sciences: Biology 1A-1B; (8) Social sciences: three courses; (9) Humanities: three courses; (10) additional courses in chemistry, mathematics or physics as recommended by the student's adviser.

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

* Students who plan to specialize in health education for the public health major may substitute the following courses for Chemistry 1B and 1C, Chemistry 1N, and an elective course in a physical science.

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.

RELIGIOUS STUDIES

Advisory Committee: P. L. Newman, Chairman; G. Buccellati; K. K. S. Chen; R. Low, W. Thackara; B. Vorpahl.

The University does not presently offer a degree program in Religious Studies, although a number of courses which study religion are offered in various departments. Students interested in devising an independent major in religious studies should contact the Chairman of the Committee for additional information.

The Department of History offers a graduate specialization in the History of Religions. Undergraduate students desiring information concerning preparation for this program should contact the graduate adviser in the Department of History.

The following courses have been designated by the Committee as those in which the study of religious phenomena is central to the course; Anthropology 140 (Comparative Religion), Classics 166A (Greek Religion), Classics 166B (Roman Religion), Classics 161 (Introduction to Classic Mythology), Classics 145B (Byzantine Civilization: Theology and Relations with Rome), History 124A-124B (History of Religions), History 124C (Religions of the Ancient Near East), Indo-European Studies 140 (Introduction to Indo-European Mythology), Oriental Languages 168 (Introduction to Buddhist Thought), Oriental Languages 172A (Hinayana Buddhism), Oriental Languages 172B (Mahayana Buddhism), Philosophy 175 (Philosophy of Religion), Philosophy 173A-173B (Chinese Buddhism).

There are also other courses relating to the study of religion emphasizing its literary, artistic or philosophical aspects in various appropriate departments.

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).

The College of Fine Arts admits students only in the fall.

Students desiring to major in Dance or Music will be asked for an audition and/or testing prior to acceptance by the department. Those who wish to enter the Department of Theater Arts will be required to submit a portfolio consisting of photographs or slides of previous work, together with a statement of past achievements, aims while at UCLA, and goals for future work in the chosen field.

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. No more than one course (4 units) of Physical Education 1 and 2 may be counted toward the degree. At least 16 courses (64 units) must be in upper division courses, including two courses (8 units) outside the major department.

It is not expected that a student will normally take more than 180 units to attain the bachelor's degree. No student will be permitted to continue in the College of Fine Arts beyond 208 units, except in very rare cases approved in advance by the Dean.

The Study List. Each quarter the student study list may include from twelve to sixteen units (3 to 4 courses). Petitions for 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 in 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.

University Extension. Courses in University of California Extension (either class or correspondence) may not be offered as part of the residence 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 pages 41–42.

American History and Institutions. See page 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.

The courses indicated may be taken at the University of California or elsewhere. The list of courses and their descriptions may be used by prospective transfer students as a guide in selecting courses of similar content and purpose offered in their own institutions. Students attending a California junior college should consult their counselors to determine which junior college courses are appropriate and are accepted in satisfaction of the breadth requirements by the College of Fine Arts.

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 101A-101B.

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: 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, Classics 151A, 151B, 151C; and Psychology 188A, 188B, 188C. **Note: Performance or studio courses do not meet this requirement.**

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, Secondary Teaching Curriculum,* and Motion Pictures/Television.

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 UCLA currently offers two programs of graduate study, one in Architecture and Urban Design, leading to the degree of Master of Architecture, the other to the M.A. and Ph.D. degrees in Urban Planning. Currently, the School offers educational opportunities for a broad spectrum of careers, including a number that are not yet common in practice, but which reflect emerging social needs. The School recognizes the importance of experimental programs. The cutting edge will be a combination of research and task-force-oriented field work integrated into the educational experience to form a continuously unfolding learning process. Since education and research must not be divorced from service to the community, the programs must evolve community-serving professions: "learning to do good competently" should start at the earliest possible moment. The programs of the School of Architecture and Urban Planning at UCLA reflects the University's concern with the escalating problems of the changing urban environment and its largely untapped potentialities.

In order to relate closely to public affairs and practitioners in the field, the School has established the Urban Innovations Group Workshop to take advantage of opportunities for community action research and for continuing education for professionals.

The Urban Innovations Group Workshop undertakes "real-world" projects to provide graduate students with opportunities to gain practical experience. It also affords faculty opportunities for professional service. To reflect the nature of the problems and the opportunities associated with the creation and maintenance of environments of the future, the projects are on-going and programmatic. They range from pure research, applied research, development, and prototype testing to full scale implementation, including people-oriented problems, technology, and, most importantly, those of innovation in institutional forms and processes.

The Urban Innovations Group Workshop provides a bridge or transition between pure academic pursuits and professional practice.

Architecture and Urban Design

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 archi-

¹ The School has under study a program leading to a Master of Arts in Architecture and Urban Planning which is intended to provide for the specialized learning needs of those with or without previous education in architecture whose primary motivation is not professional practice but teaching, consulting or research in the environmental design field. Interested students should write directly to the Head of the Program for information about its availability.

ture, 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.

THE AREAS OF STUDY

The Program is organized around seven Areas of study which represent major directions within architecture and urban design.

A. Projects in Architecture and Urban Design

The practical application of problem analysis and design method to environmental problems. The student acquires the ability to analyze and conceptualize specific designs as he participates, individually or in teams, in projects which vary in scale and complexity from the design of individual components to portions of the city or entire physical systems.

Courses: 247. Design Seminar in Educational Systems and Facilities; 401. Projects in Architecture; 402. Projects in Urban Design; 451. Elements and Multiples; 452. Redevelopment; 453. Urban Facilities; 454. Regional Facilities and Networks; 496. Special Projects in Architecture; 497. Special Projects in Urban Design.

B. Design Method

Empirical and theoretical study of the processes of design. Critical evaluation of techniques and methods, with particular emphasis on computer-aided procedures. The relations between organizational context, communication, information and method.

Courses: 206A–206B. Topics in Human Information Processing; 220A. Quantitative Methods: Basic Analytical Concepts; 224. Methodology: Design Theory; 226. Computer Application; 227. Computer-Aided Design; 228. Research in Design Methods; 280. Information Systems; 410. Fundamentals of Design.

C. Environmental Technology

To consider physical technological solutions to the built environment, at both the architectural and urban scale, giving particular emphasis to the systems approach to problem solving. Subjects will range from those concerned with urban systems technologies—energy distribution, transportation, communication, etc., to those of building systems—enclosures, structure, environmental controls, services, etc.

Courses: 242. Systems Building; 243. Research in Environmental Technology; 246. Transportation and Communications; 423A–423B. Architectural Technology; 424A–424B. Environmental Controls; 425A–425B. Structural Systems.

D. Environment and Behavior

To introduce architecture students to existing behavioral science knowledge concerning the relation of man to his social and physical environment, as well as appropriate methods for assessing various aspects of this relation; and, to present this area of knowledge as a partial basis for understanding theories and philosophies of environmental design.

Courses: 225. Cognitive Processes in Design; 253. Man-Environment Relations; 254. Image and Cultural Symbolization; 256. Housing Patterns; 257. Social Meaning of Space; 258. Research in Man-Environment Relations.

E. Architectural and Urban Analysis

Examination of properties and relations of the elements of architecture and the urban environment. The needs and behavior of individuals and groups are studied with respect to their mutual inter-relation in order to understand the environmental consequences. Emphasis is put on using exact methods in making the analysis.

Courses: 216. Processes of Change; 218A-218B. Urban Structure: Analysis and Modeling; 235. Architectural Case Study; 236. Urban Form; 237. Elements of Urban Design; 238. Research in Architectural and Urban Analysis; 245. Architectural and Urban Systems; M255. Urban Morphology: Definitions and Consequences.

F. Environmental Management

The development of management procedures for forecasting, planning and designing the systems of the physical environment. On the assumption that architects and urban designers will become agents of change who will act upon the future physical environment, the forms of organization to fulfill this role are examined. The introduction and management of innovation in the architecture and urban design professions, both in theory (teaching and research) and practice (Urban Innovations Group Workshop) is also stressed.

Courses: 203A-B. Decision-Making in Planning and Design; 204. Imaging the Future; 260A-B. Proseminar in Environmental Planning and Management; 460. Architectural Management; 461. Professional Organization and Practice; 490. Urban Innovations Group Workshop.

G. Theory, History and Criticism

Theory, history, and criticism support the field of architecture and urban design as both an activator of the professional discipline as well as the repository of its accumulated knowledge, values, and philosophies. Work in this subject area develops the conceptual frames of reference by which the project and its context are defined, examines the criteria for analysis and evaluation, probes the methodological issues underlying the design process, and stimulates an awareness of the evolution of society and culture as the context within which architectural and urban form are manifested.

Courses: 200. Man and His Environment; 201A. Architectural Theory; 270. Seminar in Environmental Design; 271A-B-C. History and Future of Environment.

The Degree Master of Architecture

THE FIRST PROFESSIONAL DEGREE PROGRAM (M.ARCH. I)

The objective of the program is to provide the student with the basic professional education necessary for the practice of architecture and urban design as they are evolving today and in the future. The competence and sensitivity which an environmental designer must bring to his task requires intensive exploration of a number of subject areas, and the ability to organize and purposefully integrate widely varied forms of information relevant to a given project. In this curriculum, a structured sequence of lectures, seminars and design projects is complemented with individual and group extracurricular work intended to exemplify both usual and unusual forms of professional activity.

Admission Requirements

For admission to this program, the applicant must first meet the entrance requirements of the Graduate Division of the University, including a bachelor's degree from the University of California or its equivalent and a grade average of B or better. In addition, the School of Architecture and Urban Planning requires that the applicant submit the material outlined in the Departmental Application Form. Particular emphasis is placed on the Statement of Purpose, letters of recommendation, and evidence of creative or analytic ability in either graphic, written, or mathematical form.

Good command of spoken and written English is absolutely essential and no foreign student will be allowed to attend classes until he passes the Graduate Division's English fluency exam and completes any required remedial courses.

If possible the applicant is invited to make an appointment for an interview with one of the faculty members of the Admissions Committee.

Additional information about the program may be obtained by writing directly to the Head of the Architecture and Urban Design Program.

Degree Requirements

The student is expected to be three years in residence at UCLA and undertake nine quarters of work while maintaining a 3.0 grade point average in all courses.

A minimum of twenty-seven courses are required for graduation distributed in the seven Areas of Study as follows:

A. Projects in Architecture and Urban Design: 451, 452, 453, 454, plus one additional course.

B. Design Method: 410, plus one additional course.

C. Environmental Technology: 423A, 423B, plus three additional courses.

D. Environment and Behavior: two courses.

E. Architectural and Urban Analysis: 235, 245, plus one additional course.

F. Environmental Management: 460, plus two additional courses.

G. Theory, History, and Criticism: 200, 270, plus one additional course. Course 598, *Preparation for Thesis*, must be taken at some time during the last year.

The remaining three courses are electives, which may be chosen from upper division or graduate courses offered University-wide.

A professionally oriented thesis will be required for completion of degree requirements. It may be in the form of a design project or a written dissertation.

THE SECOND PROFESSIONAL DEGREE PROGRAM (M.ARCH. II)

In this program, the architectural graduate or experienced professional is afforded the opportunity to develop in depth a core of conceptual and methodological skills and to pursue specialized areas of study and research, according to his professional aims and needs. An innovative attitude toward the future profession is emphasized, which is explored in seminars, projects and field experience. Each student works closely with his tutor to build a program that fits his individual interests, culminating in a Masters' thesis.

In one of these areas of specialization, Urban Design, a Letter of Certification is conferred at graduation indicating completion of a series of specified courses within the M.Arch. Degree Program. These courses are selected in order to coordinate the various disciplines related to Urban Design and to provide for a systematic sequence of courses. Emphasis is placed on introducing innovative approaches and on bridging the gap between analysis and design as well as between theory and practice.

Admission Requirements

For admission to this program, the applicant must first meet the entrance requirements of the Graduate Division of the University, including the grade average of B or better. In addition, the School of Architecture and Urban Planning requires that the applicant hold the degree Bachelor of Architecture from an accredited school, and submit the material outlined in the Departmental Application Form. Particular emphasis is placed on the Statement of Purpose, letters of recommendation, evidence of professional quality and creative or analytic ability in either graphic, written, or mathematical form.

Good command of spoken and written English is absolutely essential and no foreign student will be allowed to attend classes until he passes the Graduate Division's English fluency exam and completes any required remedial courses.

If possible the applicant is invited to make an appointment for an interview with one of the faculty members of the Admissions Committee.

Additional information about the program may be obtained by writing directly to the Head of the Architecture and Urban Design Program.

Degree Requirements

The student is expected to be two years in residence at UCLA and undertake six quarters of work.

A total of eighteen courses is required distributed in the following way:

1. Three may be taken at large from those offered campus-wide. Permission may be granted by the Head of the Program to increase this number for students following individual programs requiring greater interdisciplinary study.
2. At least five courses must be numbered in the 400 professional series.

3. The student must successfully complete at least three courses listed as Projects in Architecture and Urban Design.

4. Eight courses should be chosen from among the six other Areas of Study listed earlier with never more than three of these in any one Area. Directed Individual Study and Research, Course 596, done in one of the Areas of Study, also qualifies as a course in meeting this requirement.

5. 598, Preparation for Thesis, should be taken at some time during the last year.

A professionally oriented thesis will be required for completion of degree requirements. It may be in the form of a design project or a thesis.

The purpose of the above degree requirements is to provide ample latitude to each student in preparing his program of study and to allow him to concentrate where he wishes, while at the same time ensuring that he has received a sufficiently broad coverage to qualify him for the professional degree.

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 which may apply toward the minimum residence requirement for the Doctorate in Planning degree. 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 have been initiated. Students may also wish to work on a part-time basis outside the University in a field work course 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. 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 policies.

This emphasis on professional and field work experience tends to modify traditional role distinctions and establish a collegiate relationship among students and faculty. As a result, students will work together with their professors, for the development of the curriculum and related activities in the Program.

The Degree of Master of Arts

In terms of a formal curriculum, at the Master's degree level, the student elects one of the four 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 transportation, education, housing, health, and recreation. The third, Environmental Planning and Management, deals with the development of an evolutionary framework and the achieving of environmental quality in the context of accelerated social, scientific and technological changes. The fourth area, Social Development Policy, deals with human development policy, community-neighborhood development, and the development of tools and methods for social planning.

Complementing their work in an Area of Policy Concentration, students select 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 is offered in four areas of core specialization: planning theory, urban regional development theory, quantitative methods, and behavioral foundations for planning.

The number of required formal courses is restricted to introductory, survey-type courses and a proseminar in the second year. In concert with his faculty advisers, the student is able to develop his curriculum, with opportunity for involvement in field projects, internship work and applied research.

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.

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 for the Master of Arts.

Students are expected to devote full time to their studies. They should not plan to work more than 20 hours per week on outside jobs.

GENERAL REQUIREMENTS

The student must be in residence six quarters, except that the faculty and Head of the Program may accept up to 24 units of graduate work from another University of California campus, and up to 8 units from other schools.

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, internship project or area of policy concentration.

The Doctor of Philosophy Degree

A student must qualify for admission to graduate status; and may enter the Doctoral Program with a Master's degree in Planning or a related field. A student with only a Bachelor's degree will be admitted provisionally. If he does not perform well on an examination covering the Core areas, he will be encouraged to head for the Master's program. 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.

A minimum of two years of academic residence is required. In addition, the student must meet the general Graduate Division requirements.

Doctoral students must demonstrate, by successfully passing a series of written examinations, that they have thoroughly mastered the field of urban planning and its literature, including the subject areas of planning theory, urban regional development theory, quantitative methods, and behavioral foundations for planning.

In addition, doctoral students must elect a major Area of Policy Concentration to which all the rest of their studies are then related. An oral department examination must be taken over one APC in depth or two in breadth. The Ph.D. students must also complete at least sixteen units of course work in a minor field outside of the Department, and will be given a written examination on the minor at the discretion of the faculty.

After the student has successfully completed his examination in his major field of policy concentration, he will sit for qualifying oral examination to be conducted by his Doctoral Committee. Upon passing this examination, the student will be advanced to candidacy.

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 predental 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 pages 86-87 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 1973, should be submitted as early as possible, but no later than October 31, 1972. 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, 1972.

Further information is provided in the UCLA ANNOUNCEMENT OF THE SCHOOL OF DENTISTRY, which will be mailed upon request.

GRADUATE SCHOOL OF EDUCATION

Five advanced degree programs are offered by the Graduate School of Education leading to: Master of Arts in Education; Master of Education; Doctor of Education; the Doctor of Philosophy in Education; and the Joint Doctor of Philosophy in Special Education with California State College at Los Angeles. The degree programs are designed for the development of leadership in various educational fields.

The Graduate School of Education consists of one Department, the Department of Education. The School is administered by the Dean; an Associate Dean; an Assistant Dean for Business Affairs; an Assistant Dean for Student Affairs; and an Assistant Dean for Institutional Relations.

Curricula leading to state credentials in the following fields are also offered by the Graduate School of Education: elementary; secondary; pupil personnel services; supervision; and school administration.

THE DEPARTMENT

The five advanced degree programs in the Department of Education are currently undergoing revision and clarification. They are, therefore, not described in this catalog. Information on the current status of each program is available from the graduate adviser in the Office of Student Services, Moore Hall 201. Advice regarding the approved fields of specializations for the M.A., M.Ed., Ed.D., Ph.D., and the joint Ph.D. program in Special Education including the required admission procedures, amount and distribution of work, residence requirements, examinations, and thesis and dissertation standards may also be requested.

Graduate degree programs in the Department of Education offer opportunities for study in the following specializations: Administrative Studies; Adult Education; Business-Economic Education; Comprehensive Curriculum; Counseling; Developmental Studies in Education; Higher Education; History of Education; International and Comparative Education; Learning and Instruction; Philosophy of Education; Research Methods and Evaluation; Sociology and Anthropology

of Education; Special Education; The Organization of Schooling; Urban Educational Policy and Planning; and Vocational-Technical Education.

The Department of Education is administered by a Chairman; a Vice-Chairman in charge of Courses, Schedules, and Publication of Programs; and a Vice-Chairman in charge of Personnel.

Credential Programs†

To assure eligibility for a state 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.

Academic Achievement

A graduate student must meet the admission requirements of the Graduate Division including a 3.0 grade-point average, and remain in good standing with the Graduate Division, maintaining 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. Further evaluation may be required before the time of application for a credential.

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

† For additional information, consult an adviser in the Graduate School of Education.

temporarily assigned from public school districts, teachers engaged in residency training, and students learning to teach. Some are generalists, others 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 assessed 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 in the field of Special Education. The School is located on the seventh floor of the Neuropsychiatric Institute 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, training and service activities in conjunction with the UCLA Mental Retardation Program also located in the Neuropsychiatric Institute. NPI school staff members hold demonstration teacher appointments in the Graduate School of Education, and a faculty member in Special Education holds a joint appointment in the Department of Psychiatry and coordinates research and training activities in the NPI School for students in Education. The NPI School Director of Special Education is affiliated with the Department of Education as a Lecturer.

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 programming 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 Teacher Education Laboratory; handles details of enrollment in classes; refers candidates for graduate programs to appropriate faculty advisers; makes recommendations for scholar-

ships 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 degree program and specialization 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 Education Laboratory

In the Laboratory courses are offered leading to Single Subject and Multiple Subject state credentials. The purpose of the Laboratory is to experiment with a number of carefully designed and controlled approaches to the pre- and in-service training of teachers, and to produce exemplary curricula and materials for use throughout the nation. A close relationship is maintained with the Los Angeles Unified School District through an Advisory Council made up of District and Laboratory personnel, with twenty additional schools in the Southern California League of Cooperating Schools, and with many public schools in other districts near the University.

The Laboratory is administered by a Director, who is responsible for the operation of all Laboratory activities and programs, the scheduling and staffing of Laboratory courses, and the assignment of students to supervised teaching and internship positions. The staff consists of research faculty and clinical associates who devote a significant portion of their time to the study of teacher education and the preparation of teachers for kindergarten through grade twelve. Students elected by their peers are also members of the Laboratory. The faculty of the Laboratory is responsible for formulating and recommending policy to the faculty of the Graduate School of Education. A Steering Committee appointed by the Dean serves in an advisory capacity to the Director.

The Media Materials Center, housed in Moore Hall 340, is operated by the Laboratory under the direction of the Media Advisory Committee appointed by the Dean of the Graduate School of Education.

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 and in any postgraduate work.

A student seeking admission to the Graduate Division must file formal applications with both the Department of Education and the Graduate Admissions Office indicating his professional interest. He must also submit the 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 applications may be made directly to the Office of Student Services of the Graduate School of Education, Moore Hall, University of California, Los

Angeles. The last day to submit applications for the academic year 1973-1974 (Fall Quarter) for advanced degrees is December 30. The last days to file for admission for teaching credentials are December 30 for the Fall Quarter, 1973, and October 1 for the Spring Quarter, 1974.

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. 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 concurrent 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 concurrent 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 these courses taken in University Extension are to be submitted to the Office of Student Services.

Graduate Record Examination†

The Aptitude Test of the Graduate Record Examination or the equivalent is required prior to admission to graduate status for all degree candidates in education (new applicants, readmissions, or renewal of previous applications). This requirement also applies to the Pupil Personnel Credential, Administration Credential, and Supervision Credential.

Arrangements for taking the Graduate Record Examination may be made by contacting the Educational Testing Service, at 20 Nassau Street, Princeton,

† 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.

New Jersey; 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 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. 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.

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**.

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:

Parts I and II form the four-year Bachelor of Science degree program. **Part I** is the basic two-year lower division segment.

Part II is the two-year upper division segment 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 lower division segment, **Part I**, consists primarily of instruction in mathematics, the basic physical sciences, social sciences, and humanities.

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 must satisfy the general admission requirements of the University as outlined on pages 25-31 of this bulletin.



Applicants for admission to the School in advanced standing 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. (See pages 115-116.)

Students who wish to enter the school at the graduate level are referred to page 31 of this bulletin and to the ANNOUNCEMENT OF THE GRADUATE DIVISION.

Requirements for the Degree of Bachelor of Science

The School of Engineering and Applied Science at UCLA awards the Bachelor of Science degree to students who have completed a program of four years of engineering studies in a variety of engineering disciplines. The requirements for this degree are described below.

The Engineering and Applied Science Curriculum

Part 1. Lower Division in the College of Letters and Science (23 Courses, 92 Units)

(See page 255.)

	<i>Units First Quarter</i>	<i>Units Second Quarter</i>	<i>Units Third Quarter</i>
Freshman Year			
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
Sophomore Year			
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 114.

CORE COURSE REQUIREMENT

Engineering 100—Circuit Analysis	4 units
Engineering 100L—Circuit Analysis Laboratory	2 units
Engineering 100B—Engineering Electromagnetics	4 units
Engineering 100D—Information Processing Systems	4 units
Engineering 101A—Engineering Analysis	4 units
Engineering 102—Mechanics of Particles and Rigid Bodies	4 units
Engineering 103A—Elementary Fluid Mechanics	4 units
Engineering 105A—Engineering Thermodynamics	4 units
Engineering 105D—Transport Phenomena	4 units
Engineering 107B—Introduction to Science of Materials	4 units
Engineering 107C—Intermediate Materials Science	2 units
Engineering 108—Mechanics of Deformable Solids	4 units

SUGGESTED PROGRAM

The student should consult his adviser to plan the detailed program.

	Units First Quarter	Units Second Quarter	Units Third Quarter
Junior Year*			
Core Courses	12	12	12
Major Field and/or Mathematics Electives† ...	—	4	—
Humanities Electives†	—	—	4
	12	16	16
Senior Year			
Core Courses	8	—	—
Major Field and/or Mathematics Electives† ..	8	12	12
Humanities Electives†	—	4	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.

* Engineering 101A should be taken in the first quarter of the junior year; Engineering 107B and 107C 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. For specific requirements within the humanistic and major field areas see page 116.

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 the requirement, Engineering 107B.

A course in digital computer programming, using a higher-level language such as Fortran IV, will satisfy the requirement, Engineering 10.

Certain lower division technical courses such as surveying, engineering drawing, engineering measurements, and descriptive geometry will be given credit as free electives. (A maximum of three courses may be free electives.)

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.

Experience indicates that students who have completed the recommended lower division program in engineering at California community colleges are able to complete the requirements for the B.S. degree in six quarters (two academic years) of normal full-time study.

Elective Courses. Parts I and II of the Engineering and Applied Science Curriculum include provision for 20 elective courses to be chosen within the following categories:

1. Free electives, 3 courses.

Any course yielding credit acceptable to the University of California may be selected.

2. Humanities, Social Sciences, and/or Fine Arts, 7 courses.

Of the seven, at least three courses must be upper division and at least three must be in the same academic department or must otherwise reflect coherence with respect to subject matter. Within the coherent group upper division courses should predominate.

Additional information regarding the humanities electives may be found under the Senior Year Planning Procedure on page 117.

3. Life Science, 1 course.
4. Mathematics, 2 courses (upper division).
To be chosen from an approved list.
5. Major Field, 7 courses (upper division).

The seven courses shall include (a) at least a one-course experience in design to be satisfied by parts of not more than two courses in the 100 or 200 series, (b) at least one course in an approved laboratory, to be satisfied either by a full laboratory course or two courses that include laboratory; and (c) one course in economics chosen from an approved list of courses given in the Economics and Engineering Systems Departments in the 100 series.

Furthermore, the electives in either of categories 2 or 5 above shall include

courses dealing primarily with engineering and science in society in the 100, 200, or 596 series.

Lists of courses approved to satisfy the elective categories specified above are posted on the bulletin board in the Undergraduate Studies Office, Boelter Hall 6426.

Bachelor of Science Degree Requirements

The curricular requirements for the Bachelor of Science degree consist of Parts I and II (46 courses, 184 units), and the University requirements in American History and Institutions, and senior residence.

Senior Year Planning Procedure

1. *Choose the curriculum* under which you wish to graduate. You will normally use the curriculum in effect when you began full-time continuous study in Engineering or Pre-Engineering at UCLA. Any student has the option of selecting the Catalog in effect at the time he graduates. Community college transfers have the additional option of choosing the Catalog in effect at the time they began their community college work in an *engineering* program providing attendance has been continuous since that time.

2. Attend the Junior Conference conducted during the term by the School of Engineering and Applied Science for the purpose of helping you to plan your senior year.

3. *Plan your electives.* Your regular faculty adviser is available to assist you in planning your electives and for discussions regarding your career objectives. Discuss your elective plan with him and obtain his approval.

See any member or members of the faculty specially qualified in your major field for advice in working out a program of major field and humanities electives to prepare you for your professional objective. A list of faculty members and their specialties is posted on the Undergraduate Studies Office bulletin board.

Whenever possible, students are assigned to advisers by major fields of interest. You may request a specific adviser or an adviser in a particular Engineering Department by submitting a Request for Change of Undergraduate Adviser form available in the Undergraduate Studies Office.

Members of the Undergraduate Studies Office staff are available to assist you with University procedures and to answer any questions which you may have in regard to general requirements.

4. *Special Notice Regarding Humanities Electives.* The primary objective of the humanities electives is to provide the student with an introductory but basic insight to the fundamental principles of human relationships and their social and aesthetic institutions. These principles form the underlying basis for Engineering as a profession, defining as they do the origin of human needs. Since this objective must be met in a limited number of units it is essential that the courses be wisely chosen. A second objective is to develop an interest in the study of humanities so that by continued self-study postgraduation, education in this vital area will be expanded to meet the minimum needs of the practicing Engineer 10 to 15 years later.

With few exceptions, courses intended primarily to develop specific skills

should be avoided (e.g. dexterity in performance on a musical instrument, ability to manipulate people, grammatical and composition skills, etc.). This virtually eliminates all Management, many Psychology, and most performance courses. An exception is effective when the particular "skill" course is prerequisite to another upper division course which is strictly in the humanities or social science (e.g. foreign language and literature courses taught in the language, etc.).

Of the seven courses, at least three (12 units) must be upper division courses. Students from California community colleges (only) may reduce this to two upper division courses (8 units) *provided* they are in the same field; however, *all* students, including California community college transfers must have a minimum total of 7 humanities courses.

To provide some depth, at least three courses (12 units) must be in the same academic department or must otherwise reflect coherence in respect to subject matter. In such a group, upper division courses should predominate.

A list of courses which are normally acceptable individually as humanities electives is available in the Undergraduate Studies Office. However, this list is not all-inclusive and in particular cases other courses may be acceptable when taken in context with a complete elective selection.

Certain courses in the humanities departments (e.g., logic), although excellent courses, are not acceptable because either (1) the student's engineering, mathematics, and science courses have already provided an adequate background, or (2) they are not strictly humanities.

5. The Elective Selection form approved by the adviser must be filed in triplicate in the Undergraduate Studies Office, Boelter Hall, Room 6428, during the last quarter of the junior year. The deadline for high juniors to submit their elective selections is announced each term in the Undergraduate Enrollment Instructions brochure, School of Engineering and Applied Science.

GENERAL INFORMATION

E.C.P.D. Accreditation. The Engineering Curriculum is accredited by the Engineers' Council for Professional Development, the nationally recognized accrediting body for engineering curricula.

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 students entering the lower division 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 elective course programs approved by the end of the junior year.

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 3% 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 (Room 6266) which is open from 5 to 9 p.m. Monday through Thursday 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, 3731K 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.

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.

Computer System Modeling and Analysis. Mathematical modeling, analysis and optimization; time-sharing system models; computers scheduling and resource allocation; memory management; data communications; computer networks; performance evaluation.

ELECTRICAL SCIENCES AND ENGINEERING

Chairman, F. G. Allen, 7732B Boelter Hall, telephone: 825-2647

The courses and research in this department cover four specialty areas:

Applied Plasma Physics. The practical aspects of plasma physics, including plasma production, confinement, and heating; suppression of instabilities; generation, propagation, and interaction of electromagnetic and plasma waves.

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 wave interaction; magnetic and dielectric properties of matter.

Electronic Circuits. Analysis and synthesis of active, passive, digital and distributed circuits; computer-aided circuit design and optimization; investigation of electronic circuits using solid state and quantum electronic devices; study and application of electronic signal processing circuits and systems.

Solid State Electronics. Semiconductors; electric, magnetic and conductive properties of matter and the application of these to the investigation of solid state devices; radiation effects on devices. Quantum electronics, including lasers, holography, nonlinear optics and spin resonance.

ENERGY AND KINETICS

Chairman, E. L. Knuth, 5531K Boelter Hall, telephone: 825-5423 or 825-2046

Engineering problems which graduates of the Energy and Kinetics Department are prepared to solve include problems in air-pollution control, atmospheric entry, batteries, corrosion, enclosures with human occupants, fast nuclear reactors, fuel cells, nuclear reactor siting and safety, propulsion, sea water de-

salination and space-vehicle temperature control. Areas of specialization within the Department include:

Chemical-Engineering. 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, and sampling from combustion systems using molecular-beam techniques.

Nuclear Engineering. Neutron transport; nuclear-reactor kinetics, dynamics, materials, safety and siting.

Thermodynamics. Statistical, chemical, and non-equilibrium thermodynamics; cryogenics; magnetic and low-temperature phase transitions; effect of pressure on magnetic transition temperatures; thermodynamics of imperfect gases; superfluid heat transport; and transport properties of condensed quantum systems.

ENGINEERING SYSTEMS

Chairman, M. F. Rubinstein, 7629 Boelter Hall, telephone: 825-7731

Course work and research are offered in five areas:

Operations Research. Optimization theory; linear programming; nonlinear programming; dynamic programming; large-scale mathematical programming; network flows and programming techniques; stochastic processes; decision theory; and queueing theory and applications.

Dynamics and Control. Dynamics and stability of feedback control systems; design and synthesis of feedback control systems; time domain methods in engineering control systems; on-line computer control systems; optimal control; dynamics and control of stochastic systems; identification and adaptive control; bio-cybernetics-modeling and control of physiological processes.

Water Systems Engineering. Water resources engineering; surface and ground-water hydrology; optimization of water resources systems; water quality management; saline water conversion; economic evaluation of water resources development.

Engineering Economics and Management. Management, design, and economic analysis of resources; economic development; computer aided design; reliability engineering.

Biotechnology. Bioenergetic and biomaterial aspects of engineering systems; life and behavioral science foundations to technology; man-equipment-environment interactions; linear and nonlinear models of living systems in the control loop; quantitative and qualitative methods of biotechnical design and evaluation; applications to surface and aerospace transport systems.

MATERIALS

Chairman, A. S. Tetelman, 6531K Boelter Hall, telephone: 825-5664

Metallurgy. Fracture of steels and composite materials, joining of materials; heat treatment of steel, fracture of weld metal; high temperature and fatigue fracture; mechanics of extrusion, forging and rolling; materials synthesis, vacuum metallurgy, structure-property relationships; crystal growth, casting and modern foundry practice; thin films.

Materials Science. Electron microscopy, x-ray and electron diffraction; theoretical metallurgy, phase transformation in solids; solidification science; irradiation effects on structural materials, strengthening mechanism in solids; high pressure effects on solids; elasticity of crystals and crystal defects; structure of liquid and amorphous alloys, and plastically deformed metals; magnetic properties of solids, boundary layer studies; structure and properties of polymers.

Ceramics. Oxidation kinetics, mechanical properties of oxides; thermodynamics and strength of ceramic solids, application of ceramics; glass science, and electrical properties of amorphous materials.

Materials Recycling. Recycling glass, waste, and plastics.

MECHANICS AND STRUCTURES

Chairman, J. D. Cole, 5732B Boelter Hall, telephone: 825-1161 or 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. General dynamics of compressible and incompressible flows, effects of viscosity, diffusion, chemical reaction, stratification, magnetic fields, turbulence theory and experiment, hydrodynamic stability, acoustic theory and experiment, wave motion, rarefied gas dynamics, bio-fluid dynamics, application to vehicle performance and stability and control, application to pollution and other technical problems.

Solids. Elasticity, viscoelasticity, plasticity, micromechanics, wave propagation in solids, continuum mechanics, static and dynamic analysis of plates and shells, fracture mechanics, mechanics of fatigue, mechanics of composite materials, theoretical soil mechanics and bio-mechanics.

Soil Mechanics. Soil dynamics, creep and relaxation, reinforced earth, engineering seismology, earth structures, foundations, landslides.

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, soil-structure interaction.

SYSTEM SCIENCE

Chairman, A. V. Balakrishnan, 4532 Boelter Hall, telephone: 825-2180.

Departmental courses are the Engineering series 120, 121, 122, 127, 128,

129, 220, 222, 227, 228, 229. The Department offers instruction and research in the following general fields and their interrelationships:

Automata and Formal Languages. Machines, grammars, languages; applied logic, computational complexity, theory of computing; finite-state systems, identification and diagnosis, probabilistic machines; context-free languages, families of languages, restricted Turing machines, decision problems, tree automata.

Communication Systems. Information theory, source and channel coding (block and convolutional), signal detection, estimation and filtering, modulation and demodulation, data compression, coherent communication and tracking, radar signal processing, optical communication.

Control Systems. Optimal control and computing techniques, identification, estimation, and adaptivity, stochastic control, differential and N-person games, interactive control and team theory, distributed systems, applications to aerospace systems, biomedical systems, process control and controlled thermonuclear reactions.

Queueing Systems and Network Flows. Point processes; queueing systems, single server queues, priority queues; graphs and network flows, maximum flows in nets (deterministic and stochastic systems), single and multicommodity flows.

System Optimization. Continuous-state system theory and optimization, characterization and identification of states. Optimization as a programming problem in abstract spaces; nonlinear filtering; pattern recognition and classification; analysis of public and civil systems.

Graduate students in Engineering are encouraged to supplement their programs with appropriate offerings from the departments of Biology, Chemistry, Geology, Management, Mathematics, Meteorology, Physics, Physiology, or other fields closely allied to Engineering.

Engineering graduate students are required to 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 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 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 Graduate Admissions, Office of Academic Services, to the School of Engineering and Applied Science for recommendation. Final approval is granted by Graduate Admissions, Office of Academic Services.

In addition to meeting the requirements of Graduate Admissions, Office of Academic Services, the entering student in the Master's or Graduate Certificate Program 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-point 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 or Graduate Certificate Program.

Admission to the Ph.D. program normally is based on a minimum grade point 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 Graduate Admissions, Office of Academic Services, 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 for the Graduate Computer Science Program is required to take the Graduate Record Examination Aptitude Test and Advanced Test in Mathematics.

Each applicant for the Graduate Engineering Program 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, Box 1502, Berkeley, California 94701 (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 should be requested to forward the test results to the Assistant Dean for Graduate Studies, School of Engineering and Applied Science.

The test fees are as follows: Aptitude Test, \$8; one Advanced Test, \$9.

REQUIREMENTS FOR THE GRADUATE CERTIFICATE OF SPECIALIZATION IN ENGINEERING AND APPLIED SCIENCE

Each graduate certificate program consists of a minimum of five courses, two of which must be at the graduate level, 200 series. No work completed for any previously awarded degree or credential can be applied to the certificate. Successful completion of a certificate program requires an overall minimum "B"

average in all courses taken in graduate status on any campus of the University of California and in all courses applicable to a graduate Certificate of Specialization in Engineering and Applied Science. In addition, graduate Certificate candidates are required to maintain a minimum "B" average in 200-series courses. A minimum of three quarters of academic residence is required. The time limitation for completing the requirements of a certificate program is two calendar years. Details regarding the certificate programs may be obtained from the Engineering Graduate Studies Office, Room 6730, Boelter Hall.

Courses completed for a Certificate of Specialization in Engineering and Applied Science may apply subsequently toward master's and/or doctoral degrees.

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:*

- Aerothermochemistry
- Applied Electronics
- Astrodynamics
- Automata
- Biotechnology
- Ceramics and Ceramic Processing
- Chemical Engineering and Applied Chemistry
- Communication Systems
- Computer Methodology
- Computer Programming: Languages and Systems
- Computer System Architecture
- Computer Theory
- Continuum Mechanics
- Control Systems
- Dynamics
- Dynamic Systems Control
- Earthquake Engineering
- Electric Circuits

* Any student is free to propose to the School any other field of study with the support of his adviser.

Electromagnetics
 Fluid Mechanics
 Operations Research
 Mechanical and Aerospace Engineering Thermophysics
 Metallurgy and Metal Processing
 Nuclear Science and Engineering
 Queueing and Network Flow
 Science of Materials
 Soil Mechanics
 Solid Mechanics
 Solid State Electronics
 Structural Design
 Structural Mechanics
 System Optimization
 Thermodynamics
 Transportation Systems
 Urban Systems
 Water Resources

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 one day will fill high-level executive positions in industry and government. It consists of sequences of graduate-level professional courses (of the 400-series) covering significant aspects and new concepts in the 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 UCLA Graduate Admissions, Office of Academic Services, by March 15. There is a fee of \$300 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 numbers are (213) 825-4628 and 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 in Engineering or Computer Science at UCLA during the current quarter and who desires to proceed toward the Ph.D. degree is required to file a 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-point 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 Graduate Admissions, Office of Academic Services, are required to file a Notice of Intention to Proceed to Candidacy for the Degree Doctor of Philosophy 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:

- Applied Mathematics
 - Automata and Formal Languages
 - Bioengineering
 - Ceramics and Ceramic Processing
 - Communication Systems
- Computer Methodology
- Computer Programming: Languages and Systems
- Computer Systems Architecture
 - Computer Systems Modelling and Analysis
- Computer Theory
 - Control Systems
 - Deformable Solids
 - Dynamics
 - Dynamic Systems Control
- Earthquake Engineering
 - Electric Circuits
 - Electrochemical Engineering and Applied Electrochemistry
 - Electromagnetics
 - Environmental Engineering
 - Fluid Mechanics
 - Heat and Mass Transfer

• Established Minor Field Only.

Large Scale Engineering Systems
 Mathematical Theory of Systems
 Metallurgy and Metal Processing
 Molecular Dynamics
 Nuclear Science and Engineering
 Operations Research
 • Quantum Mechanics
 Queueing Systems and Network Flows
 • Radiation Biology, Health Physics, and Dosimetry
 Science of Materials
 Soil Mechanics
 Solid State Electronics
 • Spectroscopy
 Structures
 System Optimization
 Thermodynamics
 Water Systems Engineering

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.

• Established Minor Field only.

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.

QUALIFYING EXAMINATION

After the student has demonstrated his competence in the three fields, 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. Continuing Education in Engineering and Science, University Extension, brings to this field the structure and facilities of the statewide University 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 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 LSDAS Educational Testing Service, Box 944, Princeton, New Jersey 08540. If the applicant is currently enrolled in a college or university, the transcripts sent to LSDAS should cover all work completed as of the date of application and should include a statement of when the degree is expected to be conferred. If the transcript sent to LSDAS does not, at least, include work done in the Fall Semester or Fall and Winter Quarters of the senior year, the applicant must send a transcript covering the appropriate period to the Admissions and Records Office of the School of Law so that such information is received no later than April 1 of the year in which Fall admission is sought.

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, or 2200 Merton Avenue, Los Angeles, California 90047. Telephone (213) 254-5236, 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 and Law School Admission Test Scores must be received by the Law School not later than March 1 of the year in which fall admission is sought. Transcripts must be received by the LSDAS Educational Testing Service not later than March 1. 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 which is available at the Admissions and Records Office 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, the 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 School's program has been accredited by the American Library Association since 1962.

The M.L.S. (Master of Library Science) degree is based upon a course of study designed to provide basic professional competencies in librarianship, bibliography and information science. Also required is evidence of a field of speciali-

zation based upon an academic year of graduate study or its equivalent. A research paper in the field of specialization and a comprehensive examination are degree requirements. Depending upon previous relevant education and experience, the course of study requires from three (minimum) to seven (maximum) quarters.

The degree Master of Science in Information Science (Documentation) is based upon an interdisciplinary, research oriented course of study. A thesis is required.

Programs leading to post-M.L.S. Certificates of Specialization require a minimum of nine courses and three quarters of study.

Requirements for the California State Credential for school librarians may be met concurrently with master's degree requirements provided the student already has the qualifications for a standard teaching credential.

In addition to admission to graduate status, the School has special admission requirements: a satisfactory score on the General Aptitude Test of the Graduate Record Examination, foreign language reading competence, letters of recommendation, an interview, etc. Detailed information, including Fields of Specialization, may be obtained from the Graduate Adviser of the School.

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. 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, bibliography, and information science, recommend postponement of admission until the candidate has obtained nonprofessional working experience with a satisfactory performance rating.

Further information concerning entrance requirements, certificate or degree requirements, the California State Credential for School Librarians, and exclusions due to physical handicaps may be obtained from the Office of the School of Library Service.

GRADUATE SCHOOL OF MANAGEMENT

The Graduate School of Management offers curricula leading to graduate degrees at the Masters and Doctoral levels. The School also offers a Certificate of Resident Study for foreign scholars. The Department of Management offers certain courses which may be elected by undergraduate students.

Program offerings at the MBA and MS level are now under extensive review and revision with major modifications contemplated. As soon as revised programs are approved, appropriate descriptive materials will be available in the Graduate Student Affairs Office, Graduate School of Management.

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 management. Economics majors may, without petition, apply two of the following courses toward the requirement for nine upper division Economics courses.

Business Statistics,	115A	Management Accounting,	120M
Intermediate Accounting,	120	Business Finance,	130

Students with an interest in graduate study in management may pursue any undergraduate major.

Detailed information about preparation for graduate programs in management may be obtained from the Graduate Student Affairs Office, Graduate School of Management.

The Graduate Program

The Graduate School of Management's objectives are as follows:

To prepare exceptionally qualified students for careers as teachers and research scholars in the areas of management, and management related disciplines.

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 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 Management 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 Management.

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 Management. Application deadlines are as follows:

Quarter	Masters	Ph.D.
Fall	March 15†	December 30
Winter		August 30
Spring		August 30

†Note: Applications from foreign students must be filed with UCLA by January 15.

* 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 Management. 4. Educational Testing Service score on the *Admission Test for Graduate Study in Business*.

ADMISSION TO GRADUATE STATUS

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 examination. They must request the Service to forward the test results to the Assistant Dean, Graduate Student Affairs Office, Graduate School of Management. 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.

All graduate programs are full time. Graduate students in all programs are required to enroll for at least two courses per quarter.

DOCTOR OF PHILOSOPHY DEGREE**BASIC UNIVERSITY REQUIREMENTS**

See pages 151-154.

DEPARTMENTAL REQUIREMENTS

The program leading to the degree of Doctor of Philosophy in Management 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.

EDUCATIONAL CORE

Each student must attain a basic literacy and analytic competence in management studies early in his course of study. The holder of a MS in Management or 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.

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 both minor fields and must complete all requirements for his major field of study prior to 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.

The following fields offer minor and major concentrations:

Accounting-Information Systems	Marketing
Behavioral Science	Mathematical Methods
Business Economics	Operations Management
Computer Methods & Information Systems	Operations Research
Finance	Risk Bearing & Insurance
Industrial Relations	Socio-Technical Systems
International & Comparative Management	Statistics
Management Theory	Urban Land Economics

EVIDENCE OF RESEARCH ABILITY

Before taking the qualifying oral examination, each student must satisfy a research requirement designed to ensure that he has the necessary capabilities to proceed with a doctoral dissertation. The research requirement consists of courses in research methods, plus a research paper which demonstrates ability to organize a research activity, apply the appropriate research tools, and carry the project to a logical 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, at the option of the committee, a final oral examination complete the formal University requirements. Consult page 153 for 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 MEDICINE

The School of Medicine on the Los Angeles campus admits 135 freshman students each fall. Application cards and medical school catalogues for the class entering September 1973 are available from the Office of Student Affairs, UCLA School of Medicine, Los Angeles, California 90024, June 1–October 20, 1972. Applications acceptable for processing by the American Medical College Application Service (AMCAS) require a nonrefundable fee of \$20.

THE CURRICULUM

The School of Medicine operates on a quarter system with a 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 sophomore year, also three quarters, includes further study in these areas and in the fundamentals of clinical surgery. The junior year, comprising four quarters of clinical clerkships, begins the summer immediately following the sophomore spring quarter and extends to the next summer, which is the pre-senior vacation. In the three-quarter senior year the student elects his own program from a wide choice of advanced clinical clerkships, which intensify the patient responsibilities of the junior clerkship, and depth electives, which stress the scientific basis 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 academic achievement.
2. Score on the Medical College Admission Test, which is administered for the Association of American Medical Colleges by the Psychological Corporation.
3. Interview 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 strong achievement in college, a capacity for mature interpersonal relationships, and the traits of personality and character conducive 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 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; and (4) insight into human

behavior, thought and aspiration from study in social sciences and humanities of man and his society.

These objectives will ordinarily require completion of the following studies:

	Quarter Units	Semester Units
English	9	6
Physics	12	8
Chemistry		
Inorganic chemistry	12	8
Organic and quantitative chemistry	9	6
(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 \$227.00. For non-residents the total fee for each quarter is \$727.00. These fees are subject to change without notice.

ADMISSION TO ADVANCED STANDING

Transfer students are accepted into the junior year only. Transfer applications may be submitted January 1-April 30 to the Office of Student Affairs.

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 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 and community mental health nursing, including 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 November, 1972 for the fall quarter, 1973. Applications for admission to the graduate program should be filed not later than March 15, 1973 for the fall quarter, 1973; and October 1, 1973 for the winter quarter, 1974. 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 \$20 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 \$20 application fee) should be filed with the Graduate Admissions, Office of Academic Services, 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 Graduate Admissions 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: Bachelor of Science, Master of Science in Public Health, Master of Science in Biostatistics, Master of Public Health, Doctor of Public Health, Doctor of Philosophy (Biostatistics).

Bachelor of Science Degree

Candidates for the degree of Bachelor of Science must have completed at least 45 courses (180 units) of college work, of which at least the last 9 courses (36 units) must have been completed while enrolled in the School of Public Health.

PREPARATION FOR THE MAJOR

Undergraduate students who have satisfactorily completed at least 90 quarter units of work in one of the colleges of the University, or who have transfer credits evaluated as equivalent, may apply for admission to the School of Public Health. Applicants should have completed the general University requirements, as well as the following subject requirements or their equivalents: course 3 of a foreign language; English 1; Chemistry 1A, 1B, 1C (or Chemistry 1A, 1N, and an elective course in a physical science for students who plan to specialize in health education); Mathematics 1 or 3A; Biology 1A-1B; three courses in social sciences; three courses in humanities.

THE MAJOR

1. The following courses are required: Public Health 100, 110 (not required for nutritional science or environmental health students), 147, 160A; Bacteriology 100A, 100B (or Public Health 101).

2. In addition to the above requirements, those of one of the following areas of concentration must be met.

Biostatistics: Mathematics 11A, 11B, 11C, 12A, 12B, 12C, 152A, 152B; Public Health 160B, 160C, 160D, 161. Every student will be required to take courses and study in depth at upper division level an additional subject area as a basis for application of statistical methods and theories.

Environmental Health: Chemistry 4A, 4B, 4C, 6A, 6B, 6C; Physics 3A, 3B, 3C (or 6A, 6B, 6C); Psychology 10; Sociology 1 (or 101), 120; Public Health

112, 471. To bring the total number of courses completed for the degree to 45 (180 quarter units), the student selects one of the following groups of courses. In his selected group, he takes courses in the order listed. (1) Mathematics 3B, 3C. (2) Biology 108, 110, M132, 138, 166. (3) Biology 8; Bacteriology 110, 112A, 112B, 119; Engineering 107A, 180A, 180B, 181A. (4) Sociology 122; Anthropology 161; Sociology 141, 125, 150, other sociology or psychology courses.

Health Record Science: Mathematics 3B, 3C; Public Health 101, 102A, 102B, 402A, 402B; Bacteriology 100A; Management 190 (or Political Science 185), Management 182 (or Sociology 152) and a course in anatomy-physiology.

Nutritional Science: Nutritional science students should take German or French to fulfill the lower division foreign language requirement. Mathematics 3B, 3C; Chemistry 4A, 4B, 4C, 6A, 6B, 6C; Physics 3A, 3B, 3C (or 6A, 6B, 6C); Public Health 108, 114A-114B, 114D; electives chosen from Public Health 114C, 115, 116, 160B, 160C; Mathematics or Chemistry.

Health Education: English 2 or Speech 1; Physical Education 1 (three quarters); Public Health 44, 101, 105, 111 or 113, 130A, 130B, 149; Psychology 10, 130 or 133A (or Education 112), 135 or 189. Eight units (4 units in each of 2 areas) selected from: Psychology 120, 122, 125, 128, 134, 149, 175; Sociology 120, 122, 123, 124, 125, 142, M143, 151, 152, 154, 155, 157; Anthropology 100, 120, 131, 145, 147, 150, 160.

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, Infectious and Tropical Diseases, Population, Family and International Health.

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.

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). Students majoring in hospital administration are required to take an administrative residency of four quarters. (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, or public health. 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 March 15 for the following Fall Quarter.* Applicants must file an Application for Admission to Graduate Status with Graduate

Admissions, Office of Academic Services, 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 evaluation prior to the date instruction begins, and 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 Welfare 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.

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 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 Adviser: Consult the departmental Office of Admissions, 238 Social Welfare Building.

For information concerning courses and curricula, see the UCLA ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE and page 543 of this bulletin.

THE GRADUATE DIVISION

UCLA offers graduate programs, departmental and interdepartmental, 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, Education, Engineering, Fine Arts (in Art and in Theater Arts), Journalism, Library Science, Management, Nursing, Public Administration, Public Health, Social Psychiatry, and Social Welfare; to professional doctorates in Education, Public Health, and Social Welfare; to certificates in Engineering and Applied Science, Library Science, Medicine, Meteorology, and Teaching English as a Second Language; to certificates of residence for foreign students; 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 publication, STANDARDS AND PROCEDURES FOR GRADUATE STUDY AT UCLA.

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.

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, 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.

Master's Degrees

The Master of Arts is offered in the following fields:

*African Area Studies	Greek	Philosophy
Anthropology	History	Physics (M.A.T.)†
*Archaeology	*Islamic Studies	Political Science
Art	Italian	Psychology
Astronomy	Journalism	Romance Linguistics and Literature
Biology	Latin	Scandinavian
Classics	*Latin American Studies	Slavic Languages and Literatures
*Comparative Literature	Linguistics	Sociology
Dance	Luso-Brazilian Language and Literatures	Spanish
Economics	Mathematics	Speech
Education	Mathematics (M.A.T.)†	Teaching English as a Second Language
English	Microbiology	Theater Arts
*Folklore and Mythology	Music	Urban Planning
French	Near Eastern Languages and Literatures	
Geography	Oriental Languages	
German		

The Master of Science is offered in the following fields:

Anatomy	*Geochemistry	Pharmacology
Biochemistry	Geology	Physical Education
Biological Chemistry	Information Science	Physics
Biostatistics	(Documentation)	Physiology
Chemistry	Management	Planetary and Space Physics
*Comprehensive Health Planning	Medical Microbiology and Immunology	Preventive Medicine and Public Health
Computer Science	Medical Physics	Public Health
Engineering	Meteorology	

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 stand-

* Interdepartmental Programs.

† Master of Arts in Teaching.

ards 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. The application of 500-series courses to master's degrees is subject to limitations approved by the Graduate Council. Courses numbered in the 300 series are professional courses or preprofessional experience and are not applicable to University minimum requirements for graduate degrees.

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 with a minimum grade of B 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.

Courses in University Extension taken after July 1, 1969 may not apply to the University minimum of nine courses required for master's degrees with the following exception: Concurrent courses* identified with an asterisk in the University Extension bulletin may, on approval by the department and Dean of the Graduate Division, apply to University minimum course requirements for master's degrees exclusive of the five graduate-course requirement. No more than two such courses (8 units) may apply, and they must be completed with a minimum grade of B after the student has received his bachelor's degree. University Extension courses (100 series) taken *before* July 1, 1969 (identified with an asterisk in the University Extension bulletin of the appropriate year) may apply on approval by the department and Dean of the Graduate Division. No more than two such courses (8 units) may apply, and they must have been completed after the student received his bachelor's degree. Grades earned in

* Concurrent courses are courses which are offered by the University for regularly registered students in degree programs, and in which Extension students also enroll.

** 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.

University Extension are not included in computing grade averages for graduate students nor for the removal of graduate scholarship deficiencies. Correspondence courses are not applicable to graduate degrees.

See also Enrollment in Summer Session courses, page 33.

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 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, may be used to 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

† Completion of at least one graduate or upper division course (4 units) in a six-week Summer Session may be offered as the equivalent of one regular quarter of academic residence. Such credit may be earned in only one Summer Session.

by a committee, consisting of at least three members, 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 must be provisionally admitted to the Graduate Division. He 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.

Departmental nominations are submitted to the Student and Academic Affairs Section of the Graduate Division, for approval by the Dean, on or before the application dates for admission to graduate standing (page 31). Interested students should consult their departments well in advance of these dates.

Under provisional admission to the Graduate Division, Departmental Scholars are not eligible for leaves of absence or participation in the Intercampus Exchange Program.

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.

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:

Biochemistry
Chemistry
Classics
Economics
English
French
Geography
Geology

Hispanic Languages and
Literatures
History
Indo-European Studies
*Islamic Studies
Italian
Linguistics
Management
Mathematics
Meteorology

Music
Near Eastern Languages
and Literatures
Oriental Languages
Philosophy
Political Science
Psychology
*Romance Linguistics
and Literature
Sociology

* Interdepartmental Programs.

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	Geography	Near Eastern Languages
Anthropology	Geology	and Literatures
*Archaeology	Germanic Languages	*Neuroscience
Art History	Hispanic Languages	Oriental Languages
Astronomy	and Literatures	Pharmacology
Biochemistry	History	Philosophy
Biological Chemistry	Indo-European Studies	Physics
Biology	*Islamic Studies	Physiology
Biostatistics	Italian	Planetary and Space
Chemistry	Linguistics	Physics
Classics	Management	Political Science
*Comparative Literature	Mathematics	Psychology
Computer Science	Medical Microbiology	*Romance Linguistics
Economics	and Immunology	and Literatures
Education	Medical Physics	Slavic Languages
Engineering	Meteorology	and Literatures
English	Microbiology	Sociology
French	*Molecular Biology	Special Education†
*Geochemistry	Music	Urban Planning

Other doctoral degrees offered:

Education (Ed.D.) Public Health (Dr.P.H.) Social Welfare (D.S.W.)

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 general minimum course requirements for doctoral degrees 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 is generally considered optimal. A graduate student is in academic residence if

* Interdepartmental Programs.

† Joint program with California State College at Los Angeles.

he 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 and supervise the research and writing of the dissertation.

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 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. Members of the Doctoral Committee and the Dean of the Graduate Division approve the completed dissertation.

Final Oral Examination. A final oral examination may be required at the option of the members of the Doctoral Committee who are to approve the dissertation, and in some departments it may be required of all candidates.

† Completion of at least one graduate or upper division (4 units) in a six-week Summer Session may be offered as the equivalent of one regular quarter of academic residence. Such credit may be earned in only one summer session.

Students should consult their Doctoral Committee chairman or departmental graduate adviser for further information.

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.

Interdepartmental Degree Programs

In addition to graduate degree programs offered in Schools and Departments, interdisciplinary graduate programs, involving two or more participating departments, are also offered. These programs are administered by interdepartmental faculty committees appointed by the Dean of the Graduate Division, acting for the Graduate Council.

African Area Studies (M.A.), p. 158.

Archaeology (M.A., Ph.D.), p. 175.

Comparative Literature (M.A., Ph.D.), p. 231.

Comprehensive Health Planning (M.S.), p. 234.

Folklore and Mythology (M.A.), p. 296.

Geochemistry (M.S., Ph.D.), p. 310.

Islamic Studies (M.A., Ph.D.), p. 356.

Latin American Studies (M.A.), p. 367.

Molecular Biology (Ph.D.), p. 424.

Neuroscience (Ph.D.), p. 449.

Romance Linguistics and Literature (M.A., Ph.D.), p. 535.

Courses of Instruction

CLASSIFICATION AND NUMBERING

A capital "M" before the initial number of a course indicates multiple course listings in two or more different departments.

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.

Courses numbered 198 are structured special studies courses for groups. They are not listed in the catalog because they vary in content and are offered irregularly.

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 1-199, 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

Chemistry 261A-261F. Advanced Topics in Biochemistry. ($\frac{1}{2}$ course each)
indicates six half courses, 261A, 261B, 261C, 261D, 261E, and 261F. Some courses have a variable value; for example,

Management 596A-596N. Research in Management.
($\frac{1}{4}$ 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 units.

■ AEROSPACE STUDIES

(Department Office, 251 Social Welfare Building)

William E. Harris, B.S., M.S., Lt. Colonel, U. S. Air Force, Professor of Aerospace Studies (Chairman of the Department).

Anthony P. Previty, B.S., M.B.A., Captain, U. S. Air Force, Assistant Professor of Aerospace Studies.

———, Assistant Professor of Aerospace.

Air Force Reserve Officers Training Corps (Air Force ROTC)

Air Force ROTC provides selected students the opportunity to develop those attributes essential to their progressive advancement to positions of high responsibility as commissioned officers in the U. S. Air Force. This includes understanding Air Force history, doctrine, and operating principles, demonstrating ability to apply modern principles of management and human relations in the Air Force environment, and mastery of leadership theory and techniques.

Four-Year Program

The four-year program is open to beginning freshmen. It consists of an initial two-year General Military Course (GMC), described below, followed by a two-year Professional Officer Course (POC), described under "Two-Year Program." Of note is that all Air Force ROTC students must enroll each quarter in the Corps Training Laboratory as published in the UCLA Schedule of Classes.

Scholarship Program

Scholarships are available to qualified cadets in both the four-year and two-year programs. Scholarships cover full tuition, laboratory expenses, incidental fees, allowances for books, and a generous stipend.

Freshman Year

1A. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. A study of the mission and organization of the U. S. Air Force, and of U. S. strategic offensive forces: their mission and functions; employment of nuclear weapons.

Lt. Col. Harris

1B. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. Prerequisite: Course 1A. A study of the mission and functions of U. S. strategic defensive forces; begins a study of U. S. General Purpose Forces, with emphasis on the role of tactical air power.

Lt. Col. Harris

1C. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. Prerequisite: Course 1B. Concludes a study of U. S. General Purpose Forces, and examines the functions of U. S. Aerospace support forces.

Lt. Col. Harris

Sophomore Year

21A. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. Prerequisite: courses 1A, 1B, and 1C. A study of the organization and functions of the Department of Defense and role of the military in U. S. national policies; theories of general war.

Capt. Previty

21B. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. Prerequisite: course 21A. Concludes a study of general war; examines the nature and context of limited war; surveys military policies and strategies of the USSR and China; begins a study of the role of alliances in U. S. defense policies.

Capt. Previty

21C. U. S. Military Forces in the Contemporary World. (1/4 course)

Lecture-seminar, one hour. Prerequisite: course 21B. Concludes a study of the role of alliances in U. S. defense policies, and examines the elements and processes in the making of U. S. defense policy.

Capt. Previty

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 \$200.00. Students enrolled in the POC receive \$100.00 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.

Four-Week Field Training Course

Students who complete GMC, and wish to enter POC, attend of four-week field training course the summer following GMC completion. At field training, students are provided meals, quarters, clothing, travel expenses, and are paid about \$150.00 to cover incidental expenses. Subjects covered at field training include junior officer training, aircraft and aircrew orientation, career orientation, survival training, base functions, Air Force environment, and physical training. *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 airpower in the U.S. up to 1950. Practicing communication techniques and developing communicative abilities under the close supervision of the instructor. *The Staff*

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. *The Staff*

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. *The Staff*

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. *Capt. Previty*

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. *Capt. Previty*

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. *Capt. Previty*

■ AFRICA AREA STUDIES (INTERDEPARTMENTAL)

Special Program in African Studies

For details of the program in African Studies taken in conjunction with a bachelor's degree, see page 77 of this bulletin.

Master of Arts in African Area Studies

The Master of Arts in African Studies is administered by an Interdepartmental Committee. Members of this Committee are: Michael F. Lofchie (Political Science), (Chairman); E. Alpers (History); D. S. Hobbs, (Political Science); L. Kuper (Sociology); J. F. Povey (English); B. E. Thomas (Geography); W. E. Welmrs, (Linguistics).

The program for the Master of Arts in African Area Studies is designed to provide interdisciplinary training in the African area. It thus provides the student an opportunity to concentrate his work on the African area through a variety of disciplinary perspectives. 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 to (a) allow entering graduate students interested in Africa to gain an

in-depth knowledge of this world area and (b) give an African area dimension to the studies of students within specific academic disciplines. The Center gives new emphasis to the arts and humanities in relation to Africa, and it is now possible to concentrate on these subjects within the framework of the Master of Arts in African Studies. For example, such subjects as African Literature in French or English, Ethnomusicology and traditional African Art may be combined with background studies in one or more social sciences to produce an intellectual synthesis. A doctor's degree in African Area Studies is not offered. Students interested in pursuing doctoral programs with an emphasis on Africa should write directly to the department in which they are interested.

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 page 77.

Foreign Language Requirement: The student must demonstrate linguistic capacity in a language other than English in one of the following two ways. Both European and African languages are suitable for this requirement. 1. Pass the Educational Testing Service language examination with a score of 500 or higher. 2. Take three quarter-length courses in an African language. These courses will not count toward the nine courses required for the degree.

Students who first language is other than English may petition the Graduate Adviser for a waiver of the language requirement.

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 adviser, 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.

Qualifying Examination: Students must pass a comprehensive qualifying examination in the major discipline. This examination must be prepared and graded by a committee consisting of at least three faculty members at least two of whom are in the student's major department. It is the student's responsibility to make arrangements for this examination with faculty members in the appropriate department. Students should have these arrangements completed by the middle of their second quarter in residence. Any student who fails the written examination will be allowed to retake it only with the written consent of the graduate adviser and major field examiners.

Oral examination: The normal presumption is that an oral examination will be held. This oral examination may be waived if, in the view of the qualifying examination committee, it would be unnecessary.

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.

141. Social and Psychological Aspects of Myth and Ritual.

143. Primitive Art.

148. Psychological and Cultural Aspects of Cognition.

152. Traditional Political Systems.

208. African Cultures.

258. Selected Topics in African Cultures.

261. Selected Topics in Ethnology.

269. Selected Topics in Economic Anthropology.

M285A-285B. European Archaeology.

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 Development of Underdeveloped Areas: Theory and Policy.

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 (Seminar).

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.
158A-158B. The British Empire Since 1783.
199. Special Studies in History (Africa).
230N. Advanced Historiography (Africa).
240N. Topics in History (Africa).
264A-264B. Seminar in British Empire History.
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.
143A-143B-143C. Advanced 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.

171D. Music and Dance of Ghana.

- 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.

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.
165. 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.
 590. Special Problems in Sociology (Africa).

■ AGRICULTURAL SCIENCES

(Department Office, Bldg. B., 300 Veteran Avenue)

Walter Ebeling, Ph.D., *Professor of Entomology.*
 Arthur Wallace, Ph.D., *Professor of Plant Nutrition.*
 Sidney H. Cameron, Ph.D., *Emeritus Professor of Plant Physiology.*
 Vernon T. Stoutemyer, Ph.D., *Emeritus Professor of Ornamental 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 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.*
 Roger A. Gorski, Ph.D., *Professor of Anatomy (Vice Chairman for Graduate Affairs).*
 James N. Hayward, M.D., *Professor of Neurology and Anatomy.*
 Lawrence Kruger, Ph.D., *Professor of Anatomy.*
 H. W. Magoun, Ph.D., *Professor of Anatomy.*
 David S. Maxwell, Ph.D., *Professor of 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.*

- G. Douglas Silva, F.D.S., M.R.C.S., *Professor of Dentistry and Medicine.*
 Reidar F. Sognnaes, Ph.D., D.M.D., *Professor of Anatomy and Oral Biology.*
 Bernard Towers, M.B., Ch.B., (Liv.), M.R.C.S., L.R.C.P., *Professor of Pediatrics and Anatomy.*
 Richard W. Young, Ph.D., *Professor of Anatomy.*
 Richard E. Ottoman, M.D., *Emeritus Professor of Radiology and Anatomy.*
 George W. Bernard, D.D.S., Ph.D., *Associate Professor of Dentistry (Oral Biology) and Anatomy.*
 Edwin L. Cooper, Ph.D., *Associate Professor of Anatomy.*
 Emilio E. Decima, M.D., *Associate Professor of Anatomy in Residence.*
 Rafael Elul, M.D., *Associate Professor of Anatomy.*
 Richard N. Lolley, Ph.D., *Adjunct Associate Professor of Anatomy.*
 M. B. Sterman, Ph.D., *Adjunct Associate Professor of Anatomy.*
 Anna N. Taylor, Ph.D., *Associate Professor of Anatomy in Residence.*
 Alfred Weinstock, D.D.S., Ph.D., *Associate Professor of Dentistry and Anatomy.*
 Charles D. Woody, M.D., *Associate Professor of Psychiatry, Physiology and Anatomy in Residence.*
 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.*
 Jean S. de Vellis, Ph.D., *Assistant Professor of Anatomy.*
 Louis J. Goldberg, D.D.S., Ph.D., *Assistant Professor of Dentistry (Oral Biology) and Anatomy.*
 Albert V. LeBouton, Ph.D., *Assistant Professor of Anatomy.*
 Paula M. Orkand, Ph.D., *Assistant Professor of Anatomy in Residence.*
 Jack D. Thrasher, Ph.D., *Assistant Professor of Anatomy.*
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- Photios A. Anninos, Ph.D., *Assistant Professor of Biomathematics in Residence and Assistant Research Anatomist.*
 William R. Battinich, Ph.D., *Acting Instructor.*
 Jan Berkhout, Ph.D., *Associate Research Anatomist.*
 Michael Chase, Ph.D., *Associate Research Anatomist and Adjunct Associate Professor of Physiology.*
 Anatol Costin, M.D., Ph.D., *Associate Research Anatomist.*
 Ronald A. Cyrulnik, M.D., *Assistant Research Anatomist and Assistant Clinical Professor of Neurology.*
 Donald J. Davenport, M.D., *Assistant Clinical Professor of Anatomy.*
 Jaime A. Estavillo, Ph.D., *Acting Instructor.*
 Thelma Estrin, Ph.D., E.E., *Research Engineer in Anatomy.*
 William S. Glassman, M.D., *Assistant Clinical Professor of Anatomy.*
 Frances S. Grover, Ph.D., *Lecturer in Anatomy.*
 Fred Herzberg, D.D.S., *Research Anatomist and Clinical Professor of Oral Biology.*
 Jessamine O. Hilliard, Ph.D., *Associate Research Anatomist.*
 Takashi Hoshizaki, Ph.D., *Associate Research Anatomist.*
 Allan Jacobson, M.D., *Assistant Research Anatomist.*
 Ananda D. P. Jayatilaka, M.B.B.S., Ph.D., *Visiting Professor of Anatomy.*
 Leonard K. Kaczmarek, Ph.D., *Assistant Research Anatomist.*
 Shigeto Kanematsu, Ph.D., *Visiting Associate Research Anatomist.*

Claude A. Kordon, Ph.D., *Visiting Research Anatomist.*
 Raymond J. Last, F.R.C.S., *Visiting Professor of Anatomy.*
 Harold Lyons, Ph.D., *Research Theoretical Physicist in Anatomy.*
 Dennis R. Malkasian, Ph.D., *Acting Instructor.*
 Dennis J. McGinty, Ph.D., *Assistant Research Anatomist.*
 Rochelle J. Cavalas Medici, Ph.D., *Assistant Research Anatomist.*
 Samuel L. Moise, Ph.D., *Assistant Research Anatomist.*
 Frederic J. Muller, M.D., *Assistant Research Anatomist.*
 Izhak Nir, Ph.D., *Visiting Assistant Research Anatomist.*
 Hiroharu Noda, M.D., Ph.D., *Associate Research Anatomist.*
 Anselmo R. Pineda, M.D., *Assistant Clinical Professor of Anatomy.*
 Lionel D. Rovner, B.S.E.E., *Lecturer in Anatomy and Biomathematics.*
 Sant S. Sekhon, Ph.D., *Assistant Research Anatomist.*
 S. Stefan Soltysik, M.D., Ph.D., *Visiting Associate Research Anatomist.*
 Jaime R. Villablanca, M.D., *Associate Research Anatomist.*
 Donald O. Walter, Ph.D., *Associate Professor of Physiology in Residence and Associate Research Anatomist.*
 Wanda Wyrwicka, Ph.D., *Associate 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. Young 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. Bok 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. Hayward, Mr. Schlag 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. Campbell and Staff

105A-105B. Gross Anatomy.

See 207A-207B. Gross Anatomy.

106. 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

206A-206B. Neurosciences: The Introductory Course for Graduate Students. (¾ course, 1½ courses)

Two hours of lecture and two of lab per week in the winter quarter; five hours of lecture and two of lab per week in the spring quarter. Credit and grade are given only upon completion of 206B. Fundamental approaches to neuroanatomy (Winter Quarter), neurophysiology and the brain mechanisms for behavior (Spring Quarter). 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. The Staff

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. Ekl

216. Microphysiology of EEG and Evoked Potentials. (½ course)

Two hours of lecture per week in the winter quarter. Prerequisite: course 215 or consent of the instructor. The cellular processes underlying generation of spontaneous brain activity (EEG) and evoked potentials will be studied, as well as the statistical

laws controlling summation of individual cellular activities which form the potentials recorded by gross electrodes. Mr. Elul

217. Cellular Fine Structure. (½ course)

Two hours per week in the spring quarter. Prerequisite: consent of instructor. Lectures and discussion on the ultrastructure of cells: their components, their interrelationships in tissue, and their products. Mrs. Orkand

218. 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. The Staff

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 quarter. Prerequisite: consent of the 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

MEDICAL HISTORY DIVISION

(Office, 73-244 Center for the Health Sciences)

Franklin D. Murphy, M.D., Sc.D., *Professor of Medical History.*

John Field, II, Ph.D., *Emeritus Professor of Medical History and Physiology.*

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.*



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.*

Ynez V. O'Neill, Ph.D., *Assistant Research Medical Historian.*

Upper Division Course

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

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. The Staff

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

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. The Staff

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

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. Brazier

252A. History of Gynecology I. (½ course)

Prerequisite: Ability to read one foreign language. The history of gynecology from ancient times to 1700 will be dealt with by bibliography, reading of selected sources, presentation of papers and class discussion. The seminar will be continued in the Fall of 1973 (Part II), and will cover the period from 1700 to 1900.

Mr. Simmer

Individual Study and Research**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.

The Staff

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.

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.*Jaques Maquet, Ph.D., *Professor of Anthropology.*Clement W. Meighan, Ph.D., *Professor of Anthropology.*Wendell H. Oswalt, Ph.D., *Professor of Anthropology.*Johannes Wilbert, Ph.D., *Professor of Anthropology.*Harry Hoijer, Ph.D., *Emeritus Professor of Anthropology.*William A. Lessa, Ph.D., *Emeritus Professor of Anthropology.*Robert B. Edgerton, Ph.D., *Associate Professor of Anthropology and Psychiatry.*James N. Hill, Ph.D., *Associate Professor of Anthropology.*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.*William B. Rodgers, Ph.D., *Associate Professor of Anthropology.*James R. Sacket, Ph.D., *Associate Professor of Anthropology.*Bobby J. Williams, Ph.D., *Associate Professor of Anthropology.*Donald R. Ackerman, Ph.D., *Assistant Professor of Anthropology.*Christopher Donnan, Ph.D., *Assistant Professor of Anthropology.*David G. Epstein, Ph.D., *Assistant Professor of Anthropology.*Murray J. Leaf, Ph.D., *Assistant Professor of Anthropology.*Frederick T. Plog, Ph.D., *Assistant Professor of Anthropology.*Dwight Read, Ph.D., *Assistant Professor of Anthropology.*Peter Z. Snyder, Ph.D., *Assistant Professor of Anthropology.*Clyde Woods, Ph.D., *Assistant Professor of Anthropology.*



C. Rainer Berger, Ph.D., *Associate Professor of Geophysics, History, and Anthropology.*

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 of European Archaeology.*

John G. Kennedy, Ph.D., *Assistant Professor of Psychiatry and Anthropology.*

Marlys McClaran, A.B., *Lecturer in Anthropology.*

Ralph H. Turner, Ph.D., *Professor of Sociology and Anthropology.*

Preparation for the Major

Required: Anthropology 1A-1B, 5A-5B-5C.

Foreign Language

The department requires a demonstration of proficiency in one foreign language to insure that its graduates have the communication skills and cultural insights offered by such proficiency. Any spoken language (except dialects of English) is acceptable as is any extinct language with a substantial body of literature. Proficiency is defined as the ability to speak or read concerning everyday topics and is equated with the skill level to be attained through course five in a language. A variety of means for meeting the requirement is available and the department should be contacted for further information.

The Major

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 adviser. Two of these four courses required outside of the department may be CED courses.

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.

Preferential enrollment for senior majors is available through the departmental secretary in Haines Hall 372.

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 adviser. 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, su-

pervise 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.

Lower Division Courses

1A-1B. The Principles of Human Evolution.

Lecture, three hours; discussion, two hours. 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. The Staff

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.) 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

M101. The Social Sciences in Psychiatry.

(Same as Psychiatry M105.) 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-103B. Peoples of Asia.

103A. South Asia.

Mr. Leaf

103B. Southeast Asia.

Mr. Moerman

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.)

Mr. Woods

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.)

Mr. Maquet

108. Peoples of the Pacific.

(Formerly numbered 110.)

Mr. Newman

109A-109B. Old Stone Age Archeology.

(Formerly numbered 181A-181B.) 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

111A-111B. Fossil Man and His Culture.

(Formerly numbered 118A-118B.) Course 111A is prerequisite to 111B. No credit will be allowed for courses 111A without course 111B. An introduction to paleoanthropology; the morphology, ecology and culture of fossil man in the light of the synthetic theory of 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.

114. Human Evolutionary Biology.

(Formerly numbered 133.) Prerequisites: course 1A-1B or Anthropology 11. Examination of the biological physiological diversity in human populations in terms of human evolution and of short term adaptations to various environments. Mr. Ackerman

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. Rodgers, Mr. Snyder

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. Moerman

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. 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. 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. Nicholson

123E. Ancient Civilizations of Andean South America.

(Formerly numbered 134.) Prerequisite: courses 5A-5B-5C or course 22. 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. Donnan

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. Ackerman

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.

Mr. Birdsell

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.

The Staff

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. Newman

141. Social and Psychological Aspects of Myth and Ritual.

This course is aimed at understanding the social and psychological significance of myth, ritual and symbolism, with particular attention given to rituals concerned with folk psychotherapies, possession and trance phenomena.

Mr. Price-Williams

144. Aesthetic Anthropology.

Lecture, three hours. Prerequisite: upper division standing. Elaboration of a crosscultural notion of visual aesthetic phenomena that meets the requirements of anthropological research. Aesthetic phenomena as cultural: their integration in a cultural system; their relationships with other elements in the interplay of social forces.

Mr. Maquet

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

***146. Language In Culture.**

(Formerly numbered 110.) 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.
Mr. Rogers

148. Psychological and Cultural Aspects of Cognition.

Prerequisites: Anthropology and Psychology Seniors. An examination of the influences of culture on learning, perception, thinking and intelligence. The course to cover the fields of cross-cultural psychology in addition to cognitive anthropology. The focus is on learning and thinking in non-Western cultures but would include problems of education in ethnic areas within the U.S.
Mr. Price-Williams

149. Analysis of Face-to-Face Interaction.

Prerequisite: consent of instructor. This course explores a) the development of techniques for recording and formally analyzing natural interaction and, b) how members, including sociologists, make sense of social displays. Students will record data of interaction by various means: memory, field notes, verbatim records, still photos, tape recordings, film and videotape for presentation to and analysis by the class.
Mr. Moerman

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

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

* 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.

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.
Mrs. Kuper

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

154. Four Trends in Contemporary Cultural Anthropology.

Prerequisites: Courses 5A and 5B, or Sociology 17, or consent of instructor. A critical review of the origins, assumptions, research achievements, difficulties and ideological implications of "behavioral anthropology," ethnosemantics, structuralism and "cultural materialism." A weekly lecture plus a small group seminar.
Mr. Epstein

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.

Prerequisites: Open to upper-division majors in social sciences, and others by consent of the instructor. A survey of urbanization throughout the world, with emphasis on urban adaptation of rural migrants. Special focus on the problems of rural-urban migration of ethnic minority groups and subsequent adaptation of them within the United States explored in terms of the methods and perspectives of anthropology.
Mr. Epstein, Mr. Snyder

161. Development Anthropology.

Prerequisites: courses 5A-5B-5C and upper division standing or consent of the instructor. Comparative study of the peasantization of tribal peoples, the proletarianization of peasants, and the urbanization of ruralities. Particular emphasis on the relation between national and international, and localized sociocultural systems; the theory of social movements. Alternative theoretical constructs will be critically discussed.
Mr. Epstein

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.

**170A-170B. Field Training in Ethnology.
(2 courses each)**

Prerequisite: 170A is prerequisite to 170B. Lab-

oratory, sixteen hours. Undergraduates only; instructor's permission. Intensive training in ethnographic field methods. Execution of individual and group ethnographic field research projects. Training in writing research reports. Mr. Epstein

171A-171B-171C. Laboratory Methods in Physical Anthropology.

Prerequisite: Courses 1A-1B, restriction to majors only and graduate students; consent of instructor. Laboratory methodology and analysis of human variation on skeletal material (171A) and on living populations (171B) and bio-chemical methods (171C). Mr. Ackerman, Mr. Williams

173A. Mathematical Anthropology.

An introduction to statistical concepts and techniques particularly relevant to anthropology. Discussion of elementary statistical techniques and of the possible uses of statistics involving anthropological problems. Mr. Read

173B. Mathematical Anthropology.

Prerequisite: Course 173A or equivalent, or permission of instructor. Deals with specific statistical methods for approaching anthropological problems, such as Chi square distributions, tests, linear regression, analysis of variance, Guttman scaling and non-parametric tests. Mr. Read

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

M175C. Dating Techniques in Archaeology and History.

(Formerly numbered 139; same as History M107.) 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; archeological 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, docu-

mentation. Preparation of archaeological reports for publication. Mr. Meighan

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.

Prerequisite: Upper Division or Graduate Status. Permission of the instructor is required to take 182B without 182A. A systematic survey of the development of anthropology within the western academic tradition. Reviews major early concepts relevant to current anthropological issues and reviews institutional growth and development of the field. Mr. Leaf

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

184. History of Human Evolutionary Theory.

(Formerly numbered 122B.) The men, the events, and the spirit of the time which mark man's attempts to understand his origins and diversity. Mr. Williams

SPECIAL COURSES

199. Special Studies in Anthropology.

(¼ to 2 courses)

Prerequisite: 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. (1½ 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. Newman

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. Wilbert

* Graduate students may take Linguistics 220F and 220G and receive credit towards the 36 units required for the M.A. degree.

208. African Cultures.

Survey of literature and problems of African culture.
Mrs. Kuper

212. Anthropological Linguistics.

Prerequisites: Linguistics 100 or its equivalent. The development of anthropological linguistics, modern linguistic theory and its application to the study of non-linguistic aspects of culture, including relationship of language to world view; comparative historical linguistics to prehistory, lexico-statistics, semantic analysis, linguistic acculturation, and socio- and ethno-linguistics.
Miss McClaran

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. Epstein

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.
The Staff

223. Ideology and Utopia in Anthropology.

Selected trends in anthropology in relation to their social and historical location; effects of sociopolitical conflict on anthropology and vice versa.
Mr. Epstein

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. Archaeology.

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.

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.

251A-251B. Proxemic Behavior. (1 course each)

Prerequisites: course 251A is prerequisite to 251B. Consent of the instructor. A seminar covering the literature of proxemics. The study of man's perception, structuring, and use of space, from microspace in face-to-face encounters to macrospace in the layout of cities. Students will present specific research proposals for the study of proxemic behavior.
Mr. Moerman

252. Selected Topics in Higher Cultures of Nuclear America.

(Formerly numbered 264.) Prerequisite: consent of the instructor.
Mr. Nicholson

253. Selected Topics in Cultures of Asia.

Prerequisite: consent of instructor. Emphasis on different subcultural areas will vary in accordance with the instructor.
Mr. Moerman

254. Selected Topics in Cultures of the Pacific Islands.

Prerequisite: consent of the instructor.
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

259A-259B. Contemporary Latin American Problems.

(Formerly numbered 265A-265B.) 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 259B. The full sequence may be repeated for credit.
The Staff

260. Selected Topics in African Arts.

(Formerly numbered 269.) Prerequisite: consent of the instructor.
The Staff

261. Selected Topics in Ethnology.

(Formerly numbered 252.) Prerequisite: consent of the instructor.
Mr. Wilbert

262. Special Topics in Social Anthropology.

(Formerly numbered 285.) Prerequisite: consent of the instructor.
Mrs. Kuper

263. Selected Topics in Cultural Anthropology.

(Formerly numbered 286.) Prerequisite: consent of the instructor. Mr. Goldschmidt

264. Selected Topics in Cultural Ecology.

(Formerly numbered 284.) Prerequisite: consent of the instructor. Mr. Rodgers

265. Behavioral Anthropology.

(Formerly numbered 279.) Prerequisite: Course 147. Current problems in behavioral anthropology with emphasis on the design of research problems in the field. Mr. Rodgers, Mr. Graves

266. Selected Topics in Myth and Ritual.

(Formerly numbered 261.) Prerequisite: consent of the instructor.

Mr. Kuper, Mr. Newman, Mr. Price-Williams

267. Selected Topics in Kinship.

(Formerly numbered 287.) Prerequisite: consent of the instructor. Mrs. Kuper

268. Selected Topics in Comparative Political Institutions.

(Formerly numbered 288.) Prerequisite: consent of the instructor. The Staff

269. Selected Topics in Economic Anthropology.

(Formerly numbered 289.) Prerequisite: consent of the instructor. The Staff

270. Selected Topics in Culture Change.

(Formerly numbered 267.) Prerequisite: consent of the instructor. Mr. Moerman

271. Urban Anthropology.

(Formerly numbered 291.) Prerequisite: Course 160 or consent of the instructor.

Mr. Rodgers, Mr. Snyder

272A-272B. The Individual in Culture: Selected Topics.

Lecture, 2 hours Prerequisites: consent of instructor. Course 272A is prerequisite to 272B. Credit to be given only at the completion of 272B. Mr. Edgerton

273. Selected Topics in Culture and Personality.

(Formerly numbered 266.) Prerequisite: consent of the instructor. Mr. Edgerton

274A-274B. Methods in Psychological Anthropology.

(Formerly numbered 290A-290B.) 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 274B. 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. 274A deals with methods other than testing. 274B deals with diverse standardized tests applicable in cross-cultural research. Mr. Edgerton

275. Mathematical Models in Anthropology.

Prerequisite: Permission of the instructor. Several approaches to developing mathematical models and their use will be considered. In particular, Mark-

ovian chains will be introduced and models based on them will be used to test various hypotheses about social organization. Optimization theory will be considered as a basis for constructing theoretical models. Mr. Read

276. Ethnolinguistics.

(Formerly numbered 263.) Prerequisite: consent of the instructor. Problems in the relations of language to culture; structural semantics; language and pre-history. Mr. Bright, Miss McClaran

279. Seminar in Comparative Urbanization.

Discussion, 2 hours. Prerequisite: consent of instructor. Discussion and research on selected issues in the comparative study of the growth and structure of urban nuclei and social institutions in Africa, Latin America and the United States.

Mr. Epstein, Mrs. Kuper

280. Selected Topics in Principles of Human Ecology.

(Formerly numbered 275.) Prerequisite: consent of the instructor. Mr. Birdsell

281. Selected Topics in Population Genetics.

(Formerly numbered 276.) 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

282A-282B. Human Microevolution.

(Formerly numbered 277.) Prerequisite: consent of the instructor. Mr. Birdsell

283. Optimization Theory.

(Formerly numbered 295.) Prerequisite: Anthropology 173A or equivalent, or permission of instructor. An exploration of possible applications of optimization theory in anthropology, with particular emphasis on uses for physical anthropology. Ways of solving optimization problems will be discussed. Mr. Read

281. Physical Anthropology Colloquium.

To be graded on an S/U basis only. Selected topics on the status of current research in biological anthropology. The Staff

M285A-285B. European Archaeology. (½ course each)

(Same as Indo-European Studies M250A-250B.) (Formerly numbered 268A-268B.) Prerequisite: consent of the instructor. Credit to be given at the completion of 285B. The full sequence may be repeated for credit. Studies in ancient European archaeological materials, and their relationship to those of the Near East, Western Siberia, and Central Asia. Mrs. Gimbutas

286. Selected Topics in Historical Reconstruction and Archeology.

(Formerly numbered 271.) Prerequisite: consent of the instructor. Interpretation of historical development through archeological research. Application of ethnohistory to archeological problems. Mr. Meighan, Mr. Nicholson

287. Selected Topics in Prehistoric Monagricultural Societies.

(Formerly numbered 272.) Prerequisite: consent of the instructor. Regional studies in the development of early human culture. Mr. Meighan

288. Selected Topics in Problems in Old World

Archeology.

(Formerly numbered 273.) Prerequisite: consent of the instructor. Mr. Sackett

289. Selected Topics in Prehistoric Civilizations of the New World.

(Formerly numbered 274.) Prerequisite: consent of the instructor. Mr. Nicholson

290. Problems in Southwestern Archeology.

(Formerly numbered 278.) 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

291. Analysis of Field Data.

(Formerly numbered 293.) Prerequisites: course 293 or other field training course. 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. The Staff

M292. Research Methods in Community Health.

(Same as Public Health M245A.) 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 students. Mr. Reeder

293. Selected Topics in Field Training in Ethnography.

(Formerly numbered 280.) Prerequisite: consent of the instructor. Supervised collection of ethnographic information in the field. Students will spend full time in the field for most of the period. The Staff

M294A. Seminar in Ethnographic Film.

(Formerly numbered 270A.) (Same as Theater Arts M209C.) The ethnographic film as a form of realist cinema and its relations to cultural anthropology. Mr. Hawkins, Mr. Moerman

M294B-294C. Ethnographic Film Direction. (1 or 2 courses)

(Formerly numbered 270B-270C.) (Same as Thea-

ter Arts M265A-B.) Prerequisites: M294A and consent of the instructor. Advanced study of problems in the production of ethnographic films. M294B is offered in the winter quarter and M249C is offered in the spring quarter. Mr. Hawkins, Mr. Moerman

295. Seminar in Visual Anthropology.

Prerequisite: course M294A and consent of instructor. Analysis of visual anthropological materials and discussion of their implications for ethnography and other social sciences. Students will be expected to have completed fieldwork in visual anthropology and to present its results to the seminar. Mr. Moerman

M296. Selected Topics in Dating Techniques in Archeology and History.

(Formerly numbered 282; same as History M226.) Prerequisites: consent of the instructor. A colloquium devoted to topics in dating techniques in archeology and history as well as laboratory instruction and experimental work. Mr. Berger

297. Selected Topics in Field Training in Archeology. (1 to 2 courses)

(Formerly numbered 283.) Prerequisites: 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

298. Research Colloquium. (½ to 1 course)

(Formerly numbered 294.) 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

596. Individual Studies for Graduate Students.

(¼ to 2 courses)

Prerequisite: consent of the instructor. The Staff

597. Preparation for the Doctoral Qualifying Examination. (½ to 2 courses)

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

■ ARCHAEOLOGY (INTERDEPARTMENTAL)

Alexander Badawy, Ph.D., *Professor of Art.*

Paul A. Clement, Ph.D., *Professor of Classics and Classical Archaeology.*

LeRoy Davidson, Ph.D., *Professor of Art.*

Pierre Delougaz, *Professor of Near Eastern Archaeology in Residence.*

Marija Gimbutas, Ph.D., *Professor of European Archaeology.*

Kan Lao, *Academician, Professor of Oriental Languages.*

Clement W. Meighan, Ph.D., *Professor of Anthropology.*

Wendell H. Oswalt, Ph.D., *Professor of Anthropology.*

Katharina Otto-Dorn, Ph.D., *Professor of Islamic Art.*

Richard C. Rudolph, Ph.D., *Professor of Oriental Languages.*

Rainer Berger, Ph.D., *Associate Professor of History.*
 Giorgio Buccellati, Ph.D., *Associate Professor of Ancient Near East and History.*
 James N. Hill, Ph.D., *Associate Professor of Anthropology.*
 Henry B. Nicholson, Ph.D., *Associate Professor of Anthropology.*
 James R. Sackett, Ph.D., *Associate Professor of Anthropology.*
 John B. Callender, Ph.D., *Assistant Professor of Egyptology.*
 Hung-Hsiang Chou, Ph.D., *Assistant Professor of Oriental Languages.*
 Christopher B. Donnan, Ph.D., *Assistant Professor of Anthropology.*
 Susan Downey, Ph.D., *Assistant Professor of Art History.*
 Steven Lattimore, Ph.D., *Assistant Professor of Classics and Classical Archaeology.*



Jay D. Frierman, M.A., *Lecturer in Near Eastern Archaeology.*
 Miriam Lichtheim, Ph.D., *Lecturer in History and Near Eastern Bibliographer.*

An interdepartmental committee administers degree programs leading to the M.A. and Ph.D. in Archaeology, in addition to the several departmental programs in which archaeological specialization is possible. There is no B.A. program in Archaeology.

The interdisciplinary degree in Archaeology requires a planned program of graduate study in two or more departments. Students whose program will be largely within a single department (in such fields as ancient history, anthropology, art history, classics, Indo-European studies, Near Eastern languages, and Oriental languages) are referred to the separate degree programs offered by the appropriate department.

Graduate adviser: Giorgio Buccellati 8238 Bunche Hall.

Admission to Graduate Status

Admission to the M.A. program requires a B.A. degree in an appropriate discipline and submission of an acceptable plan of studies for the M.A. degree, including the list of courses to be taken and the area in which the thesis will be written.

Requirements for the M.A. degree in Archaeology

1. Twelve full quarter courses, of which at least 6 must be graduate courses. Of the graduate courses, no more than three in a single department will count toward fulfillment of degree requirements.

2. Passing of a language examination in the first year of graduate study. Ordinarily, the language will be German, French, Spanish, or Russian. The committee may require additional language skills in modern and/or ancient languages if such skills are needed for scholarly work in the area of the student's interests.

3. All students receiving the M.A. in

archaeology must demonstrate both theoretical and practical knowledge of methods and techniques actually used in archaeological field work. This requirement may be met in several ways; the general standard is that no graduate degrees will be awarded to archaeologists until they have field experience and are competent to direct field research in archaeology.

4. Completion of an M.A. thesis.

In addition, all requirements of the Graduate Division (residence, unit patterns, etc.) must be met. Consult the Graduate Division bulletin.

Requirements for the Ph.D. degree in Archaeology

1. M.A. degree from an appropriate program.

2. Reading knowledge of at least two languages, both to be passed by the end of the second year of graduate study. Additional languages may be required (see item 2 above).

3. Item 3 above unless the requirement has been previously met.

4. Passing of written qualifying examinations in at least the following three fields: a) Regional culture history; b) Topical specialization; c) Analytical methodology and theory.

5. Oral qualifying examination.

6. A doctoral dissertation which will embody the results of original research and constitute a contribution to knowledge.

Graduate Courses

Prerequisite for all courses: consent of the instructor. All courses may be repeated for credit upon recommendation of adviser.

200. Archaeology Colloquium.

Seminar, two hours. The development of archae-

ology as a discipline. Major intellectual trends and current issues in archaeology. Scientific and humanistic viewpoints presented by archaeologists from different academic departments. **The Staff**

259. Field Work in Archaeology. (½ to 2 courses)

Participation in archaeological field excavations or museum research under supervision of staff archaeologists. A minimum of one month of field time away from the campus is required. **The Staff**

Individual Study and Research

596. Individual Studies for Graduate Students.

Hours to be arranged.

The Staff

597. Preparation for Doctoral Qualifying

Examinations. (½ to 2 courses)

Prerequisite: completion of formal course work and passing of language examinations before enrollment.

Related Courses in Other Departments

Most archaeology courses are taught in the departments. They are listed here for reference, but students should consult the departmental course lists for full descriptions and prerequisites.

Ancient Near East 261. Practical Field Archaeology.

Anthropology 175A-175B. Strategy of Archaeology.

M175C. Dating Methods in Archaeology (same as History M107).

175D. Methods and Techniques of Field Archaeology.

175E. Laboratory Analysis in Archaeology.

175F. Field Training in Archaeology.

183. History of Archaeology.

230. Analytical Methods in Archaeological Studies.

232. Archaeology.

296. Selected Topics in Dating Techniques in Archaeology and History (same as History M226).

New World

Anthropology 106B. Peoples of California: Prehistory.

106D-106E. Archaeology of North America.

123C. Ancient Civilizations of Western Middle America.

123D. Ancient Civilizations of Eastern Middle America.

123E. Ancient Civilizations of Andean South America.

252. Selected Topics in Higher Cultures of Nuclear America.

M285A-285B. See Indo-European Studies M250A-250B.

287. Selected Topics in Prehistoric Non-agricultural Societies.

289. Selected Topics in Prehistoric Civilizations of the New World.

290. Problems in Southwestern Archaeology.

Art 118B. The Arts of Pre-Columbian America.

Old World—Europe

Anthropology 109A-109B. Old Stone Age Archaeology.

288. Selected Topics in Problems in Old World Archaeology.

Art 103A. Greek Art.

103B. Hellenistic Art.

103C. Roman Art.

222A-222B. Greco-Roman Art.

Classics 151A-151C. Classical Archaeology.

251A-251D. Seminar in Classical Archaeology.

Indo-European Studies 131. European Archaeology: The Neolithic Period.

132. European Archaeology: The Bronze Age.

M250A-250B. Seminar in European Archaeology (same as Anthropology M285-285B).

Old World—Near East

Ancient Near East 160A-160B. Introduction to Near Eastern Archaeology.

161A-161C. Archaeology of Mesopotamia.

220. Seminar in Ancient Egypt.

250. Seminar in Ancient Mesopotamia.

260. Seminar in Ancient Near Eastern Archaeology.

Anthropology 123A-123B. Origins of Old World Civilization.

Art 101A-101C. Egyptian Art and Archaeology.

104A. Art of the Ancient Near East.

210. Egyptian Art.

Old World—India and the Far East

Art 114A. Indian Art.

114B. Chinese Art.

114C. Japanese Art.

115A. Advanced Indian Art.

115B. Advanced Chinese Art.

115C. Advanced Japanese Art.

260. Asian Art

Oriental Languages 170A-170C. Archaeology in Early and Modern China.

188A-188B. Chinese Paleography.

270. Seminar: Selected Topics in Chinese Archaeology.

275. Seminar: Selected Topics in Chinese Cultural History.

Other Related Programs

Related courses (not listed individually) include regional geography, ancient history and regional history, ethnography, folklore,

history of technology, and courses in museum methods. Also recommended are the appropriate modern and ancient languages for the student's area of study.

■ ARCHITECTURE AND URBAN PLANNING

(Department Office, 1118 Architecture Building)

Marvin Adelson, Ph.D., *Professor of Architecture/Urban Design.*

Leland S. Burns, Ph.D., *Professor of Planning.*

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, Jr., B.Arch., *Professor of Architecture/Urban Design (Head, Architecture and Urban Design Programs).*

Peter Kamnitzer, M.Arch., M.C.P., *Associate Professor of Planning.*

Frank E. Kupper, M.Arch., *Associate Professor of Architecture/Urban Design.*

Murray Milne, M.Arch., *Associate Professor of Architecture/Urban Design (Associate Dean).*

Peter Orleans, Ph.D., *Associate Professor of Architecture/Urban Design and Sociology.*

George Rand, Ph.D., *Associate Professor of Architecture/Urban Design.*

Charles Rusch, M.Arch., *Associate Professor of Architecture/Urban Design.*

Martin Wachs, Ph.D., *Associate Professor of Planning.*

J. Eugene Grigsby, III, Ph.D., *Assistant Professor of Planning.*

Bernhard Hafner, *Assistant Professor of Architecture/Urban Design.*

Barclay Hudson, Ed. D., *Assistant Professor of Planning.*

Jurg Lang, M.Arch., *Assistant Professor of Architecture/Urban Design.*

Donald McAllister, Ph.D., *Assistant Professor of Planning.*

William Mitchell, M.E.D., *Assistant Professor of Architecture/Urban Design.*

Helmut Schultz, M.Arch., *Assistant Professor of Architecture/Urban Design.*

———, *Assistant Professor of Architecture/Urban Planning.*



Samuel Aroni, Ph.D., *Acting Professor of Architecture/Urban Design.*

William A. V. Clark, Ph.D., *Associate Professor of Geography.*

Ernest A. Engelbert, Ph.D., *Professor of Political Science.*

Robert C. Fried, Ph.D., *Associate Professor of Political Science.*

Donald G. Hagman, B.S., LL.B., LL.M., *Professor of Law.*

Leroy Higginbotham, M.A., *Lecturer in Planning.*

Ralph Iredale, Diploma in Civic Design, *Acting Professor of Architecture/Urban Design.*

Sharon L. Kaufman, M.D., *Acting Associate Professor of Planning.*

James E. Krier, B.S., J.D., *Acting Professor of Law.*

Peter Marcuse, Ph.D., *Acting Associate Professor of Planning.*

Henry W. McGee, Jr., B.S., J.D., LL.M., *Acting Professor of Law.*

Gary T. Schwartz, B.A., J.D., *Acting Professor of Law.*

Harry M. Scoble, Ph.D., *Professor of Law.*

David Stea, Ph.D., *Visiting Associate Professor of Architecture/Urban Design and Urban Planning.*

200. Man and His Environment.

Lecture, three hours. A survey of theories and methods for the study and modification of human environments, exposing students to the work and philosophy of the school and early in their career, bringing architecture and urban planning students together in common study. Mr. Perloff

201A. Architectural Theory.

Lecture, three hours. Varying present-day and historical descriptive and normative frameworks for the discussion of architecture and its relation to other aspects of the environment. The effects of literary, art, and other forms of criticism on architectural theory. Epochs and styles, ideologies and social settings for architecture. Mr. Kupper

M201B. Elements of Planning Theory.

(Same as Engineering M299A.) Prerequisite: second year standing. The course provides a broad overview of the history of planning theory and focuses on current theories concerning the linkage of a scientific-technical intelligence to organized social actions. Mr. Friedmann, Mr. Hudson

M202. Urban Planning and Controls.

(Same as Law M224.) Lecture, four hours. Analysis of the legal and administrative aspects of the regulation of land use and development, and the problems and techniques of urban planning; dwelling legislation, building codes, zoning, subdivision controls, public acquisition of land, tax controls, and urban redevelopment. Mr. Hagman

203A-203B. Decision-Making in Planning and Design.

Lecture, three hours. Statistical decision theory and alternative design solutions for coping with different degrees of future uncertainty in planning; nature of models for rational behavior in presence of conflicts of interest; individual and group decision-making under uncertainty. Mr. Adelson

204. Imaging the Future.

Lecture, three hours, discussion, one hour. Introduction to social and technological forecasting, including: nature, and limitations of forecasting ideology and values in forecasting, review of integrative forecasting techniques, and the role of forecasting in environmental planning, design and management processes. Mr. Adelson

M205. Seminar: Political and Administrative Aspects of Planning.

(Same as Political Science M228C.) Lecture, three hours. A study of the political constraints on and support for effective planning. To be explored are the relations between planning performance, on the one hand, and forms of government, distribution of power, political culture, law and social structure on the other. Mr. Englebert, Mr. Fried

206A-206B. Topics in Human Information Processing.

Lecture, two hours, laboratory, two hours. Prerequisite: consent of instructor. Information processing approach to higher mental functions used in work on complex problems, especially as encountered in planning, behavior understanding and design. Description, organization, and facilitation of adaptive, cognitive processes are stressed. Laboratory plus student projects. Methods include com-

puter-oriented techniques. Credit only on completion of 206B. Mrs. Kaufman-Diamond

207. Public Resource Allocation.

Lecture, three hours, discussion, one hour. The relationship between urban planning decisions and principles of resource allocation with emphasis on the issue of private versus public activity. Discussion of private market imperfections including externalities, collective goods and natural monopolies, and their implication for public action. Examples are drawn from public and quasi-public sectors such as education, transportation, health, water, recreation, housing and welfare programs. Mr. Burns, Mr. Hudson, Mr. McAllister

208. Social Theory for Planning.

Lecture, three hours. Examination of literature and theories from different disciplines which attempt to account for social change. "Models" such as "change, conflict, and equilibrium" will be used to critically evaluate this literature, particularly as they attempt to account for minority groups' development within America. Mr. Friedmann, Mr. Grigsby

209. Research in Planning Theory. (½ to 2 courses)

Lecture, three hours. Research seminar on topics in planning theory, selected by the faculty. May be repeated for credit. The Staff

210. Seminar: Problems of the City. (1 to 2 courses)

Laboratory, four to eight hours. Analysis of the role of the planner in different problem settings of the metropolis. Projects visits, interviews, seminar discussions. For beginning students, an analysis of several contrasting planning situations in Los Angeles, to give students firsthand experience with different modes and facets of urban planning. Mr. Kamnitzer

211. Urban-Regional Development Theory.

Lecture, three hours. Study of economic growth in urban and regional systems, and the resulting changes in spatial patterns. Special attention to planning problems associated with these developments. Mr. Burns, Mr. Friedmann, Mr. McAllister

212. Urbanization and National Development.

Lecture, two hours; discussion, two hours. Prerequisite: consent of the instructor. An advanced research seminar for students enrolled in the doctoral program. Emphasis on the comparative study of urbanization processes and implications for public policy. Mr. Burns, Mr. Friedmann

213. Seminar: Social Indicators and Reports for Metropolitan Regions. (1 to 2 courses)

Lecture, three hours. Prerequisite: second year standing. Research seminar concerned with the development of social indicators for evaluating and reporting the performance of complex urban systems. Mr. Perloff

M214. Comparative Community Political Systems.

(Same as Political Science M224H.) Lecture, four hours. Critical evaluation of the literature on community power and secondary analysis of data from extant research. Special attention to power distributions, leadership recruitment, and public and private decision-making. Mr. Scoble

M215. Urban Government.

(Same as Law M223.) Lecture, four hours. Legal problems involving local governmental entities;

sources and extent of powers and duties with respect to personnel, finance, public works, community development, and related topics. **Mr. Schwartz**

216. Processes of Change.

Discussion, four hours. Prerequisite: consent of instructor. Change as a pervasive and fundamental part of the environment; the problem of decision-making and design for a nonstatic and unpredictable future. Vernacular architecture and urbanism; evolutionary and revolutionary change and growth; obsolescence vs. deterioration; replacement; determinate and indeterminate assemblage. **Mr. Schultz**

218A-218B. Urban Structure: Analysis and Modeling.

Discussion, three hours. Prerequisite: consent of instructor. Generation of conceptual frameworks on the urban structure based on empirical data, urban theories and mathematical models. Individual and group research on selected aspects of urban systems. Application of models in decision-making, particularly in urban design projects. **Mr. Lang**

219. Research in Urban Theory. (½ to 2 courses)

(Formerly numbered 219P.) Lecture, three hours. Research seminar on selected topics in urban theory. May be repeated for credit. **The Staff**

220A. Quantitative Methods: Basic Analytical Concepts.

Lecture, three hours. Topics include: a review of algebraic vocabulary leading to models of social processes; problems of data inference (including data errors and transformation of research findings to public policy); applications of basic calculus to planning models, focussing on the problem of optimization. The course provides exposure to standardized computer programs useful for planning. Designed for students with little background in mathematics. **Mr. Hudson, The Staff**

220B. Quantitative Methods: Urban Data.

Lecture, three hours. An introduction to the sources, presentation, and interpretation of data for urban planning and design. Topics to be covered include elements of probability theory, probability distributions, sampling, estimation methods, hypothesis testing, analysis of variance, correlation, regression, and factor analysis. **Mr. McAllister**

220C. Quantitative Methods: Models.

Lecture, three hours. Prerequisite: 220A, 220B or consent of instructor. An introduction to mathematical modeling methods with emphasis on urban growth and spatial allocation models. **Mr. Wachs and The Staff**

221. Project Evaluation and Programming.

Lecture, three hours. Prerequisite: 207 or consent of the instructors. Techniques for the evaluation of projects, programs, and organizational effectiveness; benefit-cost analysis; programming-planning-budgeting systems; critical path methods; system design and comparison. **Mr. Hudson, Mr. McAllister**

223A-223B-223C. Professional Development Seminar. (½ to 1 course each)

Lecture, two hours, discussion, two hours. Seminar intended to provide continuity and linkage for students taking field work and/or internships. Con-

cerned primarily with problems of professional practice, the seminar will deal with such topics as the art of advice giving, institutional development, field research methods, and prospectus writing. Generally taken in conjunction with 596F. **Mr. Higginbotham, The Staff**

224. Methodology: Design Theory.

Lecture, three hours. A survey of the literature on systematic methods and design including problem solving, information handling, artificial intelligence, and decision-making in the design process. Seminar. **Mr. Milne, Mr. Mitchell**

225. Cognitive Processes in Design.

Lecture, three hours. 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. Ruesch**

226. Computer Applications in Architecture and Urban Design.

(Formerly numbered 410.) Lecture, three hours. 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, The Staff**

227. Computer-Aided Design.

(Formerly numbered 411.) Discussion, three hours. Prerequisite: consent of instructor. An examination of existing computer-based systems for aiding decision-making. Topics will include artificial intelligence, self-organizing systems, and hardware capabilities and limitations. An attempt will be made to develop and test components of a computer design partner. **Mr. Milne**

228. Research in Design Methods.

Lecture, three hours. Prerequisites: 224, 226 or equivalent. Developmental work on a specific method of design. Theoretical and operational problems of a design method: degree of systemization, man-machine relationships, areas of application, problems of translation and compatibility with other methods. May be repeated for credit. **Mr. Milne and Staff**

229. Research in Planning Methods. (½ to 2 courses)

(Formerly numbered 229P.) Lecture, three hours. Research seminar on selected topics in planning methodology selected by the faculty. May be repeated for credit. **The Staff**

230A-230B. Proseminar in Urban-Regional Development Policy. (2 courses each)

Lecture, three hours; discussion, two hours; laboratory, six hours. Prerequisites: Second or third year urban planning standing. Focus on the preparation of one or two research reports, one of which could ultimately lead to the M.A. thesis. Lectures and discussions on salient aspects of policy planning. Credit only on completion of 230B. **Mr. Friedmann and Staff**

M231. Urban Housing and Redevelopment.

(Same as Law M275.) Lecture, three hours. The course will comprehensively consider the rebuilding and construction of American cities with the major emphasis upon the "housing process"—the way in which shelter and related facilities are created by

the institutions which direct housing activities in urban areas. Students are encouraged to undertake research projects with an emphasis on field research in lieu of a substantial portion of the final examination. Mr. McGee

M232. Advanced Quantitative Analysis.

(Same as Geography M276.) Lecture, two hours, discussion, 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. Emphasis on linear models, factor analysis and grouping procedures as applied to geographic data bases. Mr. Clark

235. Architectural Case Study.

(Formerly numbered 405.) Discussion, three hours. Prerequisite: consent of instructor. An architectural project is presented for analysis and discussion. Topics include initial formulation, programming and planning, design analysis and development, implementation, and use. Representatives of client, user, and professional and technical participants are interviewed. Mr. Vreeland

236. Urban Form. (½ to 2 courses)

Discussion, four hours. Seminar on recent and historical urban design projects, elucidating the planning objectives, structuring principles, operational characteristics, physical components, and environmental consequences of each project. Development of a definitional framework, analytical criteria, and theoretical direction in the examination of urban form. Mr. Kopper

237. Elements of Urban Design.

Lecture, three hours. Introduction into basic knowledge of elements and methods of urban design. A multidisciplinary approach leading to an understanding of the political, socio-economic and technological framework of urban systems and its dynamic interrelations. Mr. Lang, Mr. Schulitz

238. Research in Architectural and Urban Analysis.

(Formerly numbered 439.) Discussion, three hours. Prerequisite: consent of instructor. Selected topics in architectural and urban systems. Documentation and project work; field work. Mr. Lang, and The Staff

239. Research in Urban-Regional Development Policy. (1 to 2 courses)

(Formerly numbered 239P.) Lecture, three hours. Research seminar on selected topics in urban and regional development policy selected by the faculty may be repeated for credit. The Staff

240A-240B. Proseminar in Public Service Systems. (2 courses each)

Lecture, three hours. Prerequisite: second or third year standing. A project/problem-oriented seminar dealing with the general system within which services are supplied publicly or semi-publicly, the specific sectors comprising the system, and analytical techniques for evaluating the efficiency and effectiveness of services delivered to the public. Credit only on completion of 240B. Mr. Burns

241A-241B. Research in Urban Transportation.

Lecture, three hours. An interdisciplinary approach to decision-making in urban transportation systems. This course augments theoretical models with empirical analysis of existing systems. It is part of the UCLA interschool program of Research and Training in Urban Transportation. Mr. Perloff, and The Staff

242. Systems Building.

(Formerly numbered 426.) Discussion, four hours. Prerequisite: consent of instructor. Survey of past and present developments in Europe, the USSR, and the USA. Impacts, demands, socioeconomic and legal constraints, user needs, performance specifications. Systems engineering and design. Measurement regulation, modular coordination, closed systems, open systems, design of systems, subsystems, components, elements, materials. Mr. Aroni, Mr. Schulitz

243. Research in Environmental Technology.

(Formerly numbered 429.) Discussion, three hours. Prerequisite: consent of instructor. Selected topics in environmental technology. Documentation and project work; field work. Mr. Aroni

244. Projects in Urban Building Systems.

(Formerly numbered 444.) Discussion, three hours. Advanced topics in prototype development. Identification of needed and potential improvements in design, production, management, use, and adaptation of human habitation. Evaluation of emerging methods in the development of prototypical building systems. Mr. Schulitz

245. Architectural and Urban Systems.

(Formerly numbered 420.) Lecture, three hours. Prerequisite: consent of instructor. The systems approach. Description of architectural and urban systems. Introduction to building systems. Techniques of systems analysis; representation and modeling. Case study of systems analysis. Mr. Aroni

246. Transportation and Communication.

(Formerly numbered 421.) Lecture, three hours. Environmental impacts of evolutionary transportation and communication systems; emerging trade-offs between transportation and communication systems; survey of new transportation and communication technology hardware systems; prototype design of transportation/communication model interface facilities. The Staff

247. Design Seminar in Educational Systems and Facilities.

(Formerly numbered 441.) Laboratory, six hours. Explores education as an environmental system, including goals, institutional structure, functions, technology, interactions with other social systems, and possible innovations. Examines implications for design of educational structures, facilities, equipment and arrangements. Requires design and critique of alternative physical or functional features. Mr. Adelson

M248. Urban Transportation Law. (¾ course)

(Same as Law M281.) Lecture, three hours. This course will begin with an exploration of the urgent policy questions facing the urban transportation decision-maker today. It will then focus on the existing governmental programs for urban transportation, on the policies they embody, and on the public institutions created to or charged with the duties of administering them. Mr. Schwartz

249. Research in Public Service Systems. (1 to 2 courses)

(Formerly numbered 249P.) Lecture, three hours. Research seminar on selected topics in planning for public service systems selected by the faculty. May be repeated for credit. The Staff

250A-250B. Preseminar in Social Development Policy. (2 courses each)

Lecture, three hours, discussion, two hours, laboratory, six hours. Prerequisite: second or third-year standing. A research-oriented seminar focusing on the development of social indicators for reporting on significant socio-environmental changes under way in various communities in the Los Angeles region and for highlighting the causes behind such changes. Credit only on completion of 250B.

Mr. Grigby, Mrs. Kaufman-Diamond, Mr. Perloff

251A-251B. Community Organization and Action Planning.

Lecture, four hours, discussion, two hours. Examination of the contemporary literature and research findings pertinent to city organization and planning. Students will be asked to critically review this literature and apply the findings to what they currently understand about organizational patterns of cities. Credit only upon completion of 251B.

Mr. Grigby, and the Staff

252A-252B. Human Lives in Development. (1 to 2 courses)

Lecture, three hours. Perspectives on the human, as an individual and as a group member, evolving and developing biopsychologically in interaction with environment. Biobehavioral requirements for healthy growth. Emphasis on a systems view, research, and policy implications. Optional additional directed readings in conjunction with the course.

Mrs. Kaufman-Diamond and Staff

253. Man-Environment Relations.

Discussion, three hours. Social behavior as it relates to the human habitat. Optimizing among the conflicting social interests and value systems of a pluralistic society. The human habitat in postindustrial society and in the developing nations. Problems of density, overpopulation, and overcrowding.

Mr. Orleans, Mr. Rand

254. Image and Cultural Symbolization.

Discussion, three hours. Prerequisite: consent of instructors. Seminar examining the purely communicative aspects of the visually perceived environment. Readings, discussion and experimentation, and observation.

Mr. Vreeland, Mr. Milne

M255. Urban Morphology: Definitions and Consequences.

(Same as Sociology M245.) Lecture, three hours. 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, Mr. Stea

256. Housing Patterns.

Discussion, three hours. The pattern of spatial organization in housing is studied as a reflection and reinforcement of prevailing attitudes toward the individual, the family, and the authority of the state in a variety of societies which include primitive communities, traditional civilizations, utopian experiments, contemporary American trends and countertrends.

Mr. Vreeland

257. Social Meaning of Space.

Discussion, three hours. Tracing the evolution of the concept of space from its origins in ritual and primitive social organizations. Concentrates on the

child's evolving conception of space, literature on perceptual development and studies of adaption to the spatial order of the man-made environment.

Mr. Rand

258. Research in Man-Environment Relations. (½ to 2 courses)

Discussion, three hours. Selected topics for research in social and behavioral relations to environment. May be repeated for credit.

The Staff

259. Research in Social Development Policy. (½ to 2 courses)

(Formerly numbered 259P.) Lecture, three hours. Research seminar on topics in social development policy selected by the faculty. May be repeated for credit.

The Staff

260A-260B. Preseminar in Environmental Systems Planning and Management. (2 courses each)

Lecture, three hours. Prerequisite: second or third year standing. The focus will be on the preparation of one or two student research reports, one of which could ultimately lead to the M.A. thesis. Lectures and discussions on salient aspects of policy planning. Credit only on completion of 260B.

Mr. Kamnitzer, Mr. McAllister, and the Staff

261A-261B. Environmental Planning Projects: Design Decisions and Evaluation. (1 or 2 courses)

Lecture, three hours. Prerequisite: second year standing. Case studies in physical urban planning projects providing a framework for a survey of existing methods for evaluation of alternative proposals, critical analysis of the state of the art, and search for new directions for research to meet specific urban planning and design requirements.

Mr. Kamnitzer and Staff

262. Techno-Policy Seminar.

Lecture, three hours. Prerequisite: consent of instructor. A detailed exploration of a specified environmental problem for the purpose of identifying points of institutional and technological intervention. Consideration of psychological and physiological effects of the problem. May be repeated for credit.

Mr. Burns and Staff

M264. Seminar on Air Pollution. (½ course)

(Same as Law M346.) Discussion, two hours.

Mr. Krier

269. Research in Environment Planning and Management. (1 to 2 courses)

(Formerly numbered 269P.) Lecture, three hours. Research seminar on selected topics in environmental systems planning and management selected by the faculty. May be repeated for credit. The Staff

270. Seminar in Environmental Design. (½ to 1 course)

Lecture, three hours. Activities of the environmental design professions, related disciplines and professions, and interdisciplinary groups. Historical development of architecture, engineering, and urban planning. Issues of philosophy, theory, and design. Concepts in science, art, technology, and management which have influenced architecture and urban design.

Mr. Vreeland and Staff

271A-271B-271C. History and Future of Environment.

Lecture, three hours. What man has done to change environment through history. Symbolic, cultural, functional, bio-technical domains as generators of architecture and urban planning. Value systems in environmental change: policies, plans, and design proposals as the record of the humanized environment. Alternative futures.

Mr. Orleans and Staff

280. Information Systems.

(Formerly numbered 412.) Discussion, three hours. Prerequisite: consent of instructor. Information-processing models of design. The relations between information flows and organizational structure. New techniques for information handling in design: storage and retrieval systems, automated document production, computer-assisted design techniques.

Mr. Mitchell

401. Projects in Architecture.

Laboratory, three hours. Prerequisite: consent of instructor. A number of different projects in relevant problem areas will be offered by faculty members from which the student may choose. May be repeated for credit.

The Staff

402. Projects in Urban Design.

Laboratory, three hours. Prerequisite: consent of instructor. A number of different projects in relevant problem areas will be offered by faculty members from which the student may choose. May be repeated for credit.

The Staff

410. Fundamentals of Design.

(Formerly numbered 222.) Discussion, three hours. Prerequisite: consent of instructor. Training of basic design skills: approaches to design, scheduling of design tasks, techniques of conceptualization and communication. May be repeated for credit.

Mr. Howard

423A-423B. Architectural Technology.

Lecture, three hours. Prerequisite: consent of instructor. The analysis and design of technical sub-systems, including site work, structure, enclosure, environmental controls, energy, services, transportation and communication, production and distribution. Emphasis on both organization and implementation.

Mr. Aromi, Mr. Milne, Mr. Mitchell

424A-424B. Environmental Controls.

Lecture, three hours. Prerequisite: Basic Newtonian physics. The extent to which physical form controls luminous, thermal, and auditory environmental energy. Countermeasures which modify the effects of climate and pollutants on the human habitat. Specific transportation, communication, and energy delivery systems and interface equipment.

Mr. Milne

425A-425B-425C. Structural Systems.

Lecture, three hours. Prerequisite: Basic Newtonian physics. An integrated study of load-bearing structural systems. Basic statics and mechanics of structures. Exploration of various structural behavior modes and structural systems in architecture, including frame, planar, massive, suspension, membrane and shell configuration. Materials of construction, elements, components, and systems design.

Mr. Aromi

451. Elements and Multiples.

Laboratory, nine hours. Prerequisite: consent of instructor. Units of habitation, work, education, etc.,

are designed as "elements" and then combined in functional complexes, bringing out new technical and organizational considerations. Questions of overall planning and management are discussed.

Mr. Kupper and Staff

452. Redevelopment.

Laboratory, nine hours. Prerequisite: consent of instructor. An existing urban situation is surveyed and design studies for redevelopment and rehabilitation are prepared, including residence traffic and pedestrian circulation, community services, and commercial facilities. The effect of environmental change on community life is examined.

Mr. McNab and Staff

453. Urban Facilities.

Laboratory, eight hours. Medium scale projects which have local meaning and become elements of growth and development in city-wide metropolitan systems. Examples are: elementary and secondary schools, commercial development, housing, community service facilities.

Mr. Kupper and Staff

454. Regional Facilities and Networks.

Lecture, three hours. The planning of a major urban component, such as an airport, hospital, university, and its reciprocal involvement with the pattern of regional activity, transportation, land use, organization and communication.

Mr. Ehler and Staff

460. Architectural Management.

Lecture, three hours. Problems of land development and real estate. The professions of architecture and planning: traditional and innovative organizational forms. Manufacture, distribution, transport, and on-site construction/assembly. Controls and resources: government programs and restrictions; financing and administration; costs estimation; materials and labor availability.

Mr. Iredale

461. Professional Organization and Practice.

Lecture, three hours. The profession of architecture: historical development, relation to other professions and disciplines, the changing role of the architect. Architecture and professional societies: The American Institute of Architects, state and national registration boards, educational accreditation. Legal and ethical questions relating to the practice of architecture. Emerging forms of architectural practice.

Mr. Vreeland

490. Urban Innovations Group Workshop.

Laboratory. Prerequisite: consent of Workshop Staff. Applied research and development work in the Urban Innovations Group 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.

Mr. Iredale

496. Special Projects in Architecture. (½ to 2 courses)

Prerequisite: consent of instructor. Projects initiated by either individual students or student teams, and directed by a member of the faculty. May be repeated for credit.

The Staff

497. Special Projects in Urban Design. (½ to 2 courses)

Prerequisite: consent of instructor. Projects initiated by either individual students or student teams, and directed by a member of the faculty. May be repeated for credit.

The Staff

598A. Directed Individual Research and Study in Architecture and Urban Design. (1 to 2 courses)
May be repeated for credit.

598P. Research in Planning. (½ to 2 courses)

The Staff

598F. Field Projects. (½ to 3 courses)

Directed individual field projects. May be repeated for credit.

The Staff

597P. Preparation for Doctoral Examinations in Urban Planning. (½ to 2 courses)

May be repeated for credit.

598A. Preparation in Architecture/Urban Design for the Master's Thesis. (½ to 2 courses)

Prerequisite: consent of the instructor. May be repeated for credit.

The Staff

598P. Preparation for the Master's Thesis in Urban Planning. (½ to 2 courses)

599P. Doctoral Dissertation Research in Planning. (½ to 2 courses)

ART

(Department Office, 1300 Dickson Art Center)

Samuel Amato, B.F.A., *Professor of Art.*

Oliver W. Andrews, A.B., *Professor of Art.*

Alexander Badawy, B.Arch., D.I.A., Ph.D., *Professor of Art.*

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.*

Jack B. Carter, M.A., *Professor of Art.*

J. LeRoy Davidson, Ph.D., *Professor of Art (Chairman of the Department).*

Richard Diebenkorn, M.A., *Professor of Art.*

Archine V. Fetty, M.A., *Professor of Art.*

Thomas Jennings, M.A., *Professor of Art.*

J. Bernard Kester, M.A., *Professor of Art.*

Lester D. Longman, Ph.D., L.H.D., D.F.A., *Professor of Art.*

Lee Mullican, *Professor of Art.*

Gordon M. Nunes, M.A., *Professor of Art.*

Katharina Otto-Dorn, Ph.D., *Professor of Art.*

Carlo Pedretti, M.A., *Professor of Art.*

Jan Stussy, M.F.A., *Professor of Art.*

Otto-Karl Werckmeister, Ph.D., *Professor of Art.*

Laura F. Andreson, M.A., *Emeritus Professor of Art.*

Dorothy W. Brown, A.B., *Emeritus Professor of Art.*

Helen Clark Chandler, *Emeritus Professor of Art.*

Annita Delano, *Emeritus Professor of Art.*

Josephine P. Reps, *Emeritus Professor of Art.*

Frederick S. Wight, M.A., *Emeritus Professor of Art.*

Karl E. With, Ph.D., D.F.A., *Emeritus Professor of Art.*

S. Macdonald Wright, *Emeritus Professor of Art.*

Raymond B. Brown, M.A., *Associate Professor of Art.*

Elliot J. Elgart, M.F.A., *Associate Professor of Art.*

Robert F. Heineken, M.A., *Associate Professor of Art.*

Velizar Mihich (Vasa), *Associate Professor of Art.*

Nathan Shapira, Dottore in Architettura, *Associate Professor of Art.*

Melvin Best, M.A., *Assistant Professor of Art.*

Leslie Biller, M.A., *Assistant Professor of Art.*

William C. Brown, M.A., *Assistant Professor of Art.*

Susan B. Downey, Ph.D., *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.*
 Donald F. McCallum, B.A., *Assistant Professor of Art.*
 Arnold Rubin, Ph.D., *Assistant Professor of Art.*
 Edward H. Traynor, M.A., *Assistant Professor of Art.*
 Madeleine Sunkees, B. Ed., *Assistant Professor of Art, Emeritus.*



Christian A. Choate, B.Arch., *Lecturer in Art.*
 Paula Coe, *Lecturer in Art.*
 Richard Coss, M.A., *Lecturer in Art.*
 Robert Fichter, M.F.A., *Lecturer in Art.*
 Richard Joseph, M.F.A., *Lecturer in Art.*
 Julius D. Kaplan, B.A., *Lecturer in Art.*
 Fred Marcus, M.F.A., *Lecturer in Art.*
 Robert Wark, Ph.D., *Lecturer in Art.*
 Jean Weisz, M.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 50, 51, 52, 53 and 54.

Pictorial Arts. Two courses selected from 50, 51, 52, 53 and 54; courses 10A, 10B, 20A, 20B, 25.

Design. Courses 50, 51, 52, 53 and 54.

The Major

Art History. A minimum of ten upper division courses selected in consultation with an art history adviser, including 125 and at least one course from at least five of the following nine groups: 1) 101A, 101B, 101C, 101D; 2) 103A, 103B, 103C; 3) 104B, 104C, 104D; 4) 105A, 105B, 105C, 105D, 105E; 5) 106A, 106B, 106C, 108A, 108B, 109A, 109B, 109C, 109D, 120A, 121A; 6) 110A, 110B, 110C, 110D, 120B, 121B; 7) 112A, 112B, 123A, 123B, 123C; 8) 114A, 114B, 114C, 114D, 115A, 115B, 115C; 9) 118A, 118B, 118C, 118D, 119A, 119B, 119C. No more than three courses listed under "Related Courses in Other Departments" may count as part of the major. Any "Related Course" applied on the major may not also be applied to College "Breadth Requirements." Other appropriate courses in anthropology, classics, literature, foreign languages, history, philosophy, music

and theater arts are recommended as non-major electives for the degree.

Special majors in historical and geographical area: These are set up primarily for the unusual students who are to work in greater depth on a particular phase of art instead of the normal vertical development. They will study related material around the art of some particular period or area. *Limited in number and to be approved by special committee.*

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 101-123B and four courses of art electives.

Design. In addition to the upper division Design core requirements (150A-B, 153A-B, 154A-B), and a minimum of one Design pro-seminar, the student will structure his major program from at least nine upper division design courses selected in consultation with his faculty adviser.

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 147-149. 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 151), 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

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

20A. Painting.

Studio, eight hours; six hours arranged. Prerequisite: courses 10A and 10B. Beginning course in painting. Mr. Joseph

20B. Painting.

Studio, eight hours; six hours arranged. Prerequisite: course 20A. Composition and color. Mr. Mullican

25. Sculpture.

Studio, eight hours; six hours arranged. Modeling and basic sculptural form. Mr. Andrews

30A. Introduction to Design and Technology.

Lecture, three hours; discussion, one hour. Understanding the design process with emphasis on

development of visual awareness; a study of technological, economic, environmental, and cultural factors influencing the design of objects. *Specifically for non-majors.* Mr. Kester in charge

50. Ancient Art.

Lecture, three hours; quiz, one hour. Open to Freshmen and to students who have not had credit for 1A or 100A. Prehistoric, Egyptian, Mesopotamian, Aegean, Greek, Hellenistic and Roman art and architecture. Miss Downey

51. Medieval Art.

Lecture, three hours; quiz, one hour. Open to Freshmen and students who have not had credit for former 1B or 100B. Early Christian, Byzantine, Islamic, Carolingian, Ottoman, Romanesque, and Gothic art and architecture. Mrs. Weisz

Mr. Kleinbauer, Mr. Werckmeister

52. Renaissance Art.

Lecture, three hours; quiz, one hour. Open to Freshmen and students who have not had credit for 1B or 100B. Art and architecture from 1400 to 1600 in Italy, Flanders, Germany, France, and Spain. Mrs. Weisz

Mrs. Weisz

53. Baroque Art.

Lecture, three hours; quiz, one hour. Open to Freshmen and students who have not had credit for former 1C or 100C. Art and architecture from 1600 to 1800 in Italy, France, Netherlands, Germany, Spain, England and the United States. Mrs. Weisz

54. Modern Art.

Lecture, three hours; quiz, one hour. Open to Freshmen and students who have not had credit for former 1C or 100C. Art and architecture from 1800 to the present in Europe and the United States. Mr. Kaplan, Mr. Longman

Mr. Kaplan, Mr. Longman

Related Courses in Other Departments

Integrated Arts 1A-1B-1C.

Upper Division Courses

HISTORY AND THEORY OF ART

101A. Egyptian Art and Archaeology.

Prerequisite: course 50. 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.

Lecture, three hours; quiz, one hour. Prerequisite: course 101A. Continuation of 101A. Mr. Badawy

101C. Egyptian Art and Archaeology.

Lecture, three hours; quiz, one hour. Prerequisite: course 101B. Continuation of 101B. Mr. Badawy

103A. Greek Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 50. A survey of the art and architecture of Greece from the archaic period through the 5th century B.C. Miss Downey

103B. Hellenistic Art.

Lecture, three hours; quiz, one hour. Prerequisite:

course 50 and 103A. The art and architecture of Greece from the fourth century B.C. through the first century B.C. Miss Downey

103C. Roman Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 50. The art and architecture of Rome and its Empire from ca. 300 B.C. to A.D. 300. 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.

Lecture, three hours; quiz, one hour. Prerequisite: course 51 or consent of the instructor. Architecture, painting, sculpture of the early Christian and Byzantine periods to 1453. Mr. Kleinbauer

105B. Early Medieval Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 51 or consent of the instructor. Art and architecture of Western Europe from the Migration period until 1000 A.D. Mr. Kleinbauer, Mr. Werckmeister

105C. Romanesque Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 51. Art and architecture of Western Europe in the 11th and 12th centuries. Mr. Werckmeister

105D. Gothic Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 51. Art and architecture of Europe in the 13th century. Mr. Werckmeister

106B. Italian Art of the Quattrocento.

Lecture, three hours; quiz, one hour. Prerequisite: course 52. Art and architecture of the 15th century. Mr. Birkmeyer, Mr. Pedretti, Mrs. Weisz

106C. Italian Art of the Cinquecento.

Lecture, three hours; quiz, one hour. Prerequisite: course 52. Art and architecture of the 16th century. Mr. Pedretti, Mrs. Weisz

108A. Northern Renaissance Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 52. Painting and Sculpture in the Northern Renaissance. Mr. Birkmeyer

108B. Northern Renaissance Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 108A. Painting and Sculpture in the Northern Renaissance. Mr. Birkmeyer

109A. Baroque Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 53. Art and architecture of Italy and Spain, 16th to late 17th century.

109B. Baroque Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 109A. Art and architecture of Northern Europe, 16th to late 17th century.

109C. European Art of the 18th Century.

Lecture, three hours; quiz one hour. Prerequisite: course 53. Painting, architecture and sculpture of the 18th century will be examined in the light of political and intellectual developments. Special emphasis will be given to the effect of the rise of democratic institutions, especially the French Revolution.

109D. Art and Architecture of Georgian England.

Lecture, three hours; quiz, one hour. Mr. Wark

110A. European Art of the 19th Century.

Lecture, three hours; quiz one hour. Prerequisite: course 54. Neoclassicism and Romanticism, with emphasis upon France—the development and influence of David, Ingres and Delacroix. Mr. Kaplan

110B. European Art of the 19th Century: Realism and Impressionism.

Lecture, three hours; quiz one hour. Prerequisite: course 54. An inquiry into the problem of realism with emphasis on French Art, but including developments in England and Germany. Mr. Kaplan

110C. European Art of the 18th and 20th Century: Post Impressionism to Surrealism.

Lecture, three hours; quiz one hour. Prerequisite: course 54. A study of the major developments in Modern Art, 1880's-1930, including Seurat, Cezanne, Gauguin, Van Gogh, Art Nouveau, Fauvism, German Expressionism. Mr. Kaplan

110D. Contemporary Art.

Lecture, three hours; quiz one hour. Prerequisite: course 54. European and American art since World War II. Mr. Kaplan

112A. American Art.

Lecture, three hours; quiz, one hour. Architecture in the United States from the Colonial period to the present. Mr. Bloch

112B. American Art.

Lecture, three hours; quiz, one hour. Painting in the United States in the 18th and 19 centuries. Mr. Bloch

114A. Indian Art.

Not open to freshmen. Lecture, three hours; quiz one hour. Art and architecture of India and Indonesia from prehistoric times to the present. Mr. Davidson

114B. Chinese Art.

Lecture, three hours; quiz, one hour. Not open to Freshmen. Survey of the arts of China from the Neolithic times to the 18th century. The various arts will be related to the developing historical background of the country. Mr. McCallum

114C. Japanese Art.

Lecture, three hours; quiz, one hour. Not open to Freshmen. Japanese art from its beginning in pre-history through the 19th century. Emphasis will be placed on the development of Buddhist art and its relationship with the culture. 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

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

118A. The Arts of Africa: Western Sudan.

Lecture, three hours; quiz, one hour. Mr. Rubin

118B. The Arts of Africa: The Guinea Coast.

Lecture, three hours; quiz, one hour. Mr. Rubin

118C. 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.

Lecture, three hours; quiz, one hour. Development of style and means of expression in drawing from late Middle Ages to the present. Mr. Bloch

121B. Critical and Historical Studies in Drawing.

Lecture, three hours; quiz, one hour. Continuation of 121A. Mr. Bloch

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.

Lecture, three hours; quiz, one hour. Not open to Freshmen. Kinds and criteria of criticism; analysis of esthetic experience and of the work of art; social and psychological functions of art; applications to contemporary art. Mr. Longman

123B. Theory and Criticism of Art.

Lecture, three hours; quiz, one hour. May be taken before 123A. Definitions of art and art terms; analysis of concepts of creativity, style and truth in art; study of art forms as icons of varied concepts of truth and experiences of visual reality throughout history; representation and form in contemporary art. Mr. Longman

123C. Theory and Criticism of Art.

Lecture, three hours; quiz, one hour. Prerequisite: course 123B.

site: Course 123A or 123B. Application of aesthetic theory to practical criticism of contemporary art. This is a pro-seminar type of course. Mr. Longman

125. Tutorial Conferences.

Discussion, two hours. Prerequisites: Courses 50, 51, 52, 53, and 54. Required of and restricted to all undergraduate art history majors. Discussion of selected art topics with emphasis on related readings in music, literature, history and philosophy. Oral reports. Course grading will be on Passed/Not Passed basis only. Art History 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.

History 117. History of Ancient Egypt.

Near Eastern Languages 161A. Archaeology of Mesopotamia.

161B. Archaeology of Mesopotamia.

161C. Archaeology of Mesopotamia.

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.

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.

Studio, eight hours; five hours arranged. Prerequisite: consent of the instructor. Maximum two courses. Drawing as a terminal medium of artistic expression.

133. Painting.

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

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. Prerequisite:

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

I. Core Courses

150A. Fundamentals of Design.

Lecture, two hours; laboratory, four hours. The basic visual vocabulary; development and articulation of sensory concepts. May be taken concurrently with 153A. Not open for credit to those who have previously taken 150A. Mrs. Coe in charge

150B. Fundamentals of Design.

Lecture, two hours; laboratory, four hours. Prerequisite: 150A. Interrelation of concepts as a foundation for creativity; origination and solution of problems. May be taken concurrently with 153B. Not open for credit to those who have previously taken 150B. Mrs. Coe in charge

153A-153B. Visual Presentation.

Discussion and laboratory, eight hours. 153A is prerequisite for 153B. Translation of perception through delineation, drawing, and other descriptive media. May be taken concurrently with 150A-150B. Mr. Mihich in charge

154A-154B. History of Design.

Lecture, three hours; discussion, one hour. 154A is prerequisite for 154B. Analysis of significant concepts in relation to social and technological developments. Mr. Coss

II. Comparative Studies in Design

161A. Ceramics.

Lecture, three hours; laboratory, to be arranged. The evolution of ceramic form through geographic, social, and technological influences. Mr. Traynor

161B. Clothing.

Lecture, three hours; laboratory, to be arranged. Clothing and body ornamentation; symbolic significance and evolving forms within their social, cultural, and geographic context. Mrs. McCloskey

161C. Graphics.

Lecture, three hours; laboratory, to be arranged. Symbols, signs and images, within social, cultural and historical contexts. Mr. Jennings, Mr. Brown, Mrs. Coe

161D. Glass.

Lecture, three hours; laboratory, to be arranged. The evolution of glass form and technology through geographic and sociological influences. Mr. Marcus

161E. Industrialization.

Lecture, three hours; laboratory, to be arranged. Industry, design, and society; their changing relationships. Mr. Best

161F. Landscape.

Lecture, three hours; laboratory, to be arranged.

The analysis of concepts affecting the aesthetic and ecological quality of the landscape.

161G. Shelter.

Lecture, three hours; laboratory, to be arranged. An analysis of dwelling types and forms; the forces affecting them. Mrs. Fetty, Mr. Choate

161H. Textiles.

Lecture, three hours; laboratory, to be arranged. Concepts of construction, ornamentation, expression, and utility. Mr. Kester

161J. Video Imagery.

Lecture, three hours; laboratory, to be arranged. Electronic audiographs in relation to pictorial forms; non-derivative "process level" characteristics and content-level perception. Mr. Kataoka

III. Concept and Form in Design

162A. Ceramics.

Lecture, two hours; laboratory, four hours. Introduction to creative development of ceramic materials and processes. Mr. Traynor

162B. Ceramics.

Lecture, two hours; laboratory, four hours. Prerequisite: 162A. The interaction of ideas, structure, and process. Mr. Traynor

163A. Clothing.

Lecture, two hours; laboratory, four hours. Social, cultural, and technological influences on contemporary clothing. Mrs. McCloskey

163B. Clothing.

Lecture, two hours; laboratory, four hours. Prerequisite: 163A. Communication through forms of costume and body adornment. Mrs. McCloskey

164A. Fiber Structures.

Lecture, two hours; laboratory, four hours. Design and technology of woven forms; essential elements, tools, and processes. Mr. Kester

164B. Fiber Structures.

Lecture, two hours; laboratory, four hours. Prerequisite: 164A. The derivation of non-loom processes utilizing pliable elements. Mr. Kester

165A. Graphics.

Lecture, two hours; laboratory, four hours. The development of letterforms, typography, and reproduction technology. Mr. Brown, Mrs. Coe, Mr. Jennings

165B. Graphics.

Lecture, two hours; laboratory, four hours. Prerequisite: 165A. Empiric and systematic graphic concepts, including methods, symbols, and media technology. Mr. Brown, Mrs. Coe, Mr. Jennings

166A. Glass.

Lecture, two hours; laboratory, four hours. The development of forms in glass, off-hand methods including blowing, molding, and coldworking. Mr. Marcus

166B. Glass.

Lecture, two hours; laboratory, four hours. Prerequisite: 166A. Theories of glass forming; colorants, lustres, acids, and surface delineation. Mr. Marcus

167A. Industrialized Materials.

Lecture, two hours; laboratory, four hours. The influence of diverse media, structures, and systems on form development. Mr. Coe

167B. Industrialized Materials.

Lecture, two hours; laboratory, four hours. Prerequisite: 167A. Theories of newly developed technological materials and processes as conceptual influences. Mr. Coe

168A. Landscape.

Lecture, two hours; laboratory, four hours. The modification, conservation, and utilization of natural land elements.

168B. Landscape.

Lecture, two hours; laboratory, four hours. Prerequisite: 168A. The specific relationship of modified natural elements to human requirements.

169A. Product.

Lecture, two hours; laboratory, four hours. Theoretical evolution of form in industry; synthesis of function, aesthetics, mechanical, and material properties. Mr. Best, Mr. Coe

169B. Product.

Lecture, two hours; laboratory, four hours. Prerequisite: 169A. Empiric resolution of form factors influencing concept interpretations for industry. Mr. Best, Mr. Coe

170A. Shelter.

Lecture, two hours; laboratory, four hours. The determination of criteria for designing spatial enclosures. Mr. Choate, Mrs. Fetty

170B. Shelter.

Lecture, two hours; laboratory, four hours. Prerequisite: 170A. The definition of structure and space in relation to human needs. Mr. Choate, Mrs. Fetty

171A. Textiles.

Lecture, two hours; laboratory, four hours. Surface modification through ornament. Mr. Kester in charge

171B. Textiles.

Lecture, two hours; laboratory, four hours. Prerequisite: 171A. Dyeing theories and processes; natural and synthetic colorants. Mr. Kester in charge

172A. Video Imagery.

Lecture, two hours; laboratory, four hours. Introduction to electronic image-making; video-tape and "live" representation. Mr. Kataoka

172B. Video Imagery.

Lecture, two hours; laboratory, four hours. Prerequisite: 172A. Electronic audiographic recording explored for its sensory potential; video-tape as record of process and content levels. Mr. Kataoka

IV. Proseminars in Design

192. Proseminar in Design: Resources.

Proseminar, three hours. Prerequisite: consent of adviser. Investigation of resources for creativity as an introduction to research. Concurrent enrollment in one course in Concept and Form recommended. Enrollment through Design faculty advisers. Mr. Mifflin in charge

193A-193M. Preseminar in Design: Senior Studies.

Proseminar, three hours. Prerequisite: consent of adviser. Members of the faculty will examine specific problems relevant to Design theory and performance. Topics for investigation will be announced in advance. Open to senior and advanced students through Design faculty advisers. May be repeated for a maximum of three courses.

Mrs. Fetty in charge

Special Studies for All Majors**197. Honors Course.**

Hours to be arranged. Prerequisite: recommendation of staff. Individual studies for majors with 3.5 average. Maximum, two courses. The Staff

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 Requirement, pages 93-94.

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.

Seminar, two hours. Mr. Rubin

222A-222B. Greco-Roman Art.

Seminar, two hours. Prerequisites: consent of instructor; not open to undergraduate students. A detailed study of the sculpture and architecture of Syria and Mesopotamia in the Greco-Roman Period. Credit and letter grade will be given only on completion of the full seminar sequence. Miss Downey

223. Classical Art.

Seminar, two hours. Miss Downey

225. Medieval Art.

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.

Seminar, two hours. Mr. Pedretti, Mr. Weiss

231. Leonardo and Renaissance Theory of Art.

Seminar, two hours. Mr. Pedretti

235. Northern Renaissance Art.

Seminar, two hours. Mr. Birkmeyer

240. Baroque Art.

Seminar, two hours.

245. European Art from 1700 to 1900.

Seminar, two hours.

246. Art and Architecture of Georgian England.

Seminar, two hours. Mr. Wark

253. Modern Art.

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. Heinichen

280. Graduate Graphic Design. (½ to 2 courses)

Hours to be arranged. Mr. Jennings, Mr. Kataoka

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. 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 (½ to 2 courses)

Hours to be arranged. Mr. Kester

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.*

Miroslav Plavec, Ph.D., *Professor of Astronomy.*

† Daniel M. Popper, Ph.D., *Professor of Astronomy.*

Harland W. Epps, Ph.D., *Associate Professor of Astronomy.*

Kurt W. Riegel, Ph.D., *Assistant Professor of Astronomy.*

Roger K. Ulrich, Ph.D., *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; course 3 or the equivalent in either German, French, Russian or Spanish. Recommended: Chemistry 1A.

† Absent on leave, 1972-1973.

The Major

Required: Astronomy 101, 103A-103B-103C; 117A-117B-117C; Physics 105A-105B, 131A, 110A-110B, 115A-115B. Mathematics: at least one upper division course chosen from 130 through 152. Also recommended: Astronomy 104; Physics 108, 112A, 112B, 124, 131B; 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 147-151. 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 131A. Those courses that may be required on the basis of this examination are to be completed in the student's first year of "graduate enrollment."

Requirements for the Degree of Doctor of Philosophy

General Requirements. See page 151. The Department requires reading knowledge in two of the languages: French, German, and Russian. At least one language examination is to 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 is to 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 and a 10-inch Schmidt telescope that are available to students in their independent

study and research programs in connection with courses 199, 596A and 599.

Lower Division Courses

3. Astronomy: The Nature of the Universe.

(Formerly numbered Physical Sciences 3A.) Lectures three hours, discussion one hour. Not open to students who have taken or are taking Astronomy 101. An essentially nonmathematical course for the general university student on the development of ideas in astronomy, and what has been learned of the nature of the universe, including recent discoveries and developments. The Staff

4. Topics in Modern Astronomy.

Lectures three hours, discussion one hour. Prerequisite: Astronomy 3 or the equivalent. Not open for credit to students who have taken or are taking Astronomy 101. For the general university student with previous introduction to astronomy. Selected topics (such as evolution of the solar system and stars, and cosmology) are treated in some depth, but without formal mathematics, emphasizing their significance and relationships to other sciences.

10. Practice in Observing. (½ course)

(Formerly numbered Astronomy 2.) 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 10 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. Egge

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. The Staff

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. Eppe

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

180. Senior Symposium on Topics in Modern Astronomy.

Meets three hours per week. Prerequisite: senior standing in astronomy or physics or consent of the instructor. Lectures by instructors in astronomy and related fields to supplement the regular course sequence. Topics may include: radio, infrared, UV and X-ray astronomy, observational cosmology, variable stars, planetary physics, pulsars and quasars. Mr. Ulrich

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. Eppe, Mr. Pepper, 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

* Not to be given 1972-1973.

of the interstellar medium. Stellar dynamics. Structure of the galaxy from optical and radio observations. Mr. Riegel

*227A-227B-227C. Stellar Structure and Evolution.

Meets three hours per week. Structure and evolution of the stars. Stellar energy sources and problems of nucleosynthesis. Theory of variable stars. Evolution of and mass exchange in binary stars. Final state of stellar evolution and degenerate stars. Supernova processes. Practical computation of stellar structure and evolution. Mr. Plavec, Mr. Ulrich

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).

250. Seminar on Current Astronomical Research. (½ course)

The Staff

260. Seminar on Current Astrophysical Literature. (¼ course)

Meets one hour a week. Prerequisite: permission of the instructor. A thorough and continuing examination and analysis of the most recent literature on current astrophysical problems. In particular, the seminar is designed to stimulate discussion and evaluation of those studies which have an important impact on the current astrophysical frontier. Mr. Ulrich

M285. Seminar on the Origin of the Solar System.

(Same as Planetary and Space Science M285.) 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. Planetary and Orbital Dynamics 1, 2.

225A-225B. Physics and Chemistry of Planetary Interiors 1, 2.

228A-228B. Magnetic Fields of the Earth and Planets 1, 2.

260A. Topics in Magnetospheric Plasma Physics.

260B. The Origin and Propagation of Plasma Waves in Space; Wave Particle Interactions.

266. Cosmic Ray Physics.

■ 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.*

Eli E. Sercarz, Ph.D., *Professor of Bacteriology.*

Meridian Ruth Ball, Sc.D., *Emeritus Professor of Bacteriology.*

Anthony J. Salle, Ph.D., *Emeritus Professor of Bacteriology.*

R. John Collier, Ph.D., *Associate Professor of Bacteriology.*

Frederick A. Eiserling, Ph.D., *Associate Professor of Bacteriology.*

C. Fred Fox, Ph.D., *Associate Professor of Molecular Biology in Bacteriology.*

Gregory J. Jann, Ph.D., *Associate Professor of Bacteriology.*

David R. Krieg, Ph.D., *Associate Professor of Bacteriology.*

Donald P. Nierlich, Ph.D., *Associate Professor of Bacteriology.*



Luciano Barajas, M.D., *Associate Professor of Zoology.*

John H. Campbell, Ph.D., *Assistant Professor of Anatomy.*

Wilbur T. Ebersold, Ph.D., *Professor of Botany.*

John L. Fahey, M.D., *Professor of Medical Microbiology and Immunology.*

William H. Hildemann, Ph.D., *Professor of Medical Microbiology and Immunology.*

John R. Merriam, Ph.D., *Assistant Professor of Zoology.*

James N. Miller, Ph.D., *Associate Professor of Microbiology and Immunology.*

Dan S. Ray, Ph.D., *Associate Professor of Molecular Biology.*

Richard W. Siegel, Ph.D., *Professor of Zoology.*

Winston A. Salser, Ph.D., *Associate Professor of Molecular Biology.*

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.

The Major

Bacteriology 100A-100B, 112A-112B, 119,

M132, and 100C or 110; Chemistry 153. One additional course chosen from Bacteriology 100C, 110, 111 or 113. Two additional upper division science courses from departmental list or from other science departments chosen with the approval of the Department.

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 147-152). 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 graduate and undergraduate student must confer with a departmental adviser upon entrance and at least once during every subsequent quarter. Departmental advisers are assigned in Life Science 5304.

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

7. Microbiology for the Uninitiated.

Discussion, three hours. An approach to learning about microbiology and how scientific problems are proposed and solved by a rigorous study of current research publications, conducted by an expert in the research field. Subject matter varies each quarter. Seminar type course limited to fifteen students per section. For non-science majors, pass-fail basis only.

The Staff

10. General Bacteriology.

Lecture, three hours; laboratory-discussion, six hours. Prerequisite: Biology 1A-1B; Chemistry 1A, 1N. An introduction to the biology of bacteria and their role in diseases of man. For Health Science students; not open for credit to students with credit in Bacteriology 100A; does not substitute for Bacteriology 100A in the major.

Mr. Jann

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. 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

110. The Microbiology of Infection.

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.

Mr. Pickett

111. Immunology.

Lecture, three hours; laboratory, four hours. Prerequisites: course 100B; concurrent registration in Chemistry 153. Structure of antigens and antibodies; nature of immuno-chemical specificity; cellular aspects of the immune response; regulatory mechanisms in immunology; hypersensitivity.

Mr. Sercarz

112A-112B. Structure and Physiology of Bacteria.

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. Eislerling, 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, M132, 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

M132. Comparative Genetics.

(Same as Biology M132.) Lecture, three hours. Prerequisites: Biology 1A-1B. Mendelian principles. The gene: its structure, function, and chemistry, with emphasis on mutation, coding, regulation and transmission.

The Staff

195. Preseminar. (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 instructor, based on written research proposal. Maximum enrollment for three quarters.

The Staff

Microbiology

Graduate Courses

204. Microbial Genetics.

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

208. 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

210. Advanced Microbial Biochemistry.

Lecture and discussion, three hours. Prerequisite: course 113 or consent of the instructor. A consideration of specialized aspects of microbial chemistry and metabolism with emphasis on current developments. Miss Lascelles, Mr. Nierlich

213. Membrane Molecular Biology.

Lecture, three hours; discussion, one hour. Prerequisites: Chemistry 153 or equivalent; Bacteriology M132 and Chemistry 110A recommended but not required; undergraduate seniors may enroll with consent of instructor. The structural organization and properties of lipids and proteins in artificial and biological membranes, membrane isolation techniques, physical chemistry of lipid monolayers and bilayers, membrane transport, assembly of cellular and viral membranes, properties of membranes of tumor cells. Mr. Fox

M220. Gene Structure and Function.

(Formerly Microbiology M202, Botanical Sciences M202 and Zoology M202.) (Same as Biology M220.) Lecture and discussion, three hours. Prerequisites: course M132 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

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

M227. Chromosome Structure and Replication.

(Formerly Microbiology M203, Botanical Sciences M203 and Zoology M203.) (Same as Biology M227.) Prerequisites: course M132, 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

M230. Molecular Biology Laboratory. (1 ½ courses)

(Formerly Microbiology M209 and Zoology M209.) (Same as Biology M230.) Lecture, two hours; laboratory, 12 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. Salser

M233A-233B-233C. Electron Microscopy.

(Formerly Microbiology M241A-241B-241C and Zoology M241A-241B-241C.) (Same as Biology M233A-233B-233C.) 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 M233B emphasizes thin sectioning and related methods. Course M233C 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

M257. Seminar in Host-Parasite Relationships. (½ course)

(Same as Medical Microbiology and Immunology M257.) Mr. Miller, Mr. Pickett

M259. Molecular and Cellular Immunology.

(Same as Medical Microbiology and Immunology M259.) Lecture, 2 hours. Prerequisites: Introductory course in Immunology equivalent to Bacteriology 111, Medical Microbiology & Immunology 201, or consent of instructor. Major aspects of the immune system will be presented with emphasis on fundamental principles and on advances of the past five years. Mr. Fahey, Mr. Hildemann, Mr. Sercarz

M260. Immunology Forum. (½ course)

(Same as Medical Microbiology and Immunology M260.) Lecture, one hour. Prerequisites: Bacteriology 111 or Medical Microbiology and Immunology 201 or 203, or an elementary course in general immunology. A broad range of current topics in immunology will be presented and discussed at an advanced frontier level. This is a continuing UCLA-wide, general graduate-level seminar involving faculty, postdoctoral immunologists, and graduate students from diverse departments. Mr. Hildemann

Individual Study and Research

598. Directed Individual Research.

(½ to 2 courses)

The Staff

599. Research for Master's Thesis.

(½ to 2 courses)

The Staff

599. Research for Doctoral Dissertation.

(½ to 2 courses)

The Staff

BIOCHEMISTRY

Undergraduate Biochemistry Major

The Biochemistry major is described in the Chemistry section, page 217. For further information consult the Chemistry Undergraduate Office, 2356 W. Young Hall.

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 199), in the Division of Biochemistry, Department of Chemistry (see page 217), and in the Department of Biology (See page 203). 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.*

Alexander N. Glazer, Ph.D., *Professor of Biological Chemistry.*

Isaac Harary, Ph.D., *Professor of Biological Chemistry.*

David R. Howton, Ph.D., *Professor of Biological Chemistry in Residence.*

Ralph W. McKee, Ph.D., *Professor of Biological Chemistry.*

James F. Mead, Ph.D., *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.*

Robert J. DeLange, Ph.D., *Associate Professor of Biological Chemistry.*

Samuel Eiduson, Ph.D., *Associate Professor of Biological Chemistry in Residence and Associate Professor of Psychiatry in Residence.*

Armand J. Fulco, Ph.D., *Associate Professor of Biological Chemistry.*

Dohn G. Glitz, Ph.D., *Associate Professor of Biological Chemistry.*

John E. Snoke, Ph.D., *Associate Professor of Biological Chemistry.*

Patrice J. Zamenhof, Ph.D., *Associate Professor of Biological Chemistry in Residence.*

June E. Ayling, Ph.D., *Assistant Professor of Biological Chemistry.*

John P. Blass, M.D., Ph.D., *Assistant Professor of Psychiatry and Biological Chemistry.*

John Edmond, 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.*

Requirements for Admission to Graduate Status

1. For general University requirements for the M.S. degree, see pages 147-149; for the Ph.D. page 151 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 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 Introductory 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 some financial support can be made available to students in the program after completion of one or two years of the medical curriculum. Contact Dr. David S. Sigman, the Department Adviser, for further information concerning the program.

Requirements for the M.S. degree

1. General University Requirements, see pages 148-149.

2. Thesis Plan. Courses M251, M253, M255, M257, M263, and M267 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 M251, M253, M255, M257, M263, and M267 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 151.

2. Courses M251, M253, M255, M257, M263, and M267 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 David S. Sigman, Graduate Adviser, Department of Biological Chemistry, School of Medicine, 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, neuro-biochemistry, 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 Lecture (Dental Students).

Lecture, three hours. Prerequisite: courses for admission to dental school. Required in the dental curriculum; consent of the instructor is required for nonmedical students. The biochemical properties and

structures of living systems are considered with special emphasis on mineral metabolism and nutrition. The Staff

102C. Biological Chemistry Laboratory and Seminar (Dental Students). (½ course)

Laboratory, four hours. Required in the dental curriculum; consent of the instructor is required for nondental students. The laboratory, which consists of experiments designed to illustrate biochemical principles, involves studies on enzymes, metabolic processes, respiration and calcified structures. The seminars, which will be given by the students to small discussion groups, involve presentation of material from current research dealing with biochemical studies related to dentistry.

Mr. McKee, Mr. Snook and the Staff

Graduate Courses

220A-220B-220C. 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. Howard, Mr. Markland, 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

222. Seminar in Experimental Neurochemistry. (½ course)

Lecture or recitation, two hours. Prerequisite: course 221. Application of selected methods to the investigation of current problems in neurochemistry, with emphasis on utility, validity and limitations of procedures and interpretation of data. Topics may include cell separation, subcellular fractionation, tissue culture, substrate utilization and identification of macromolecules. Mr. Roberts and the Staff

M251. Bioorganic Catalysis. (½ course)

(Same as Chemistry M251.) Lecture, two hours. Prerequisites: course 101B (or Chemistry 153); Chemistry 110A-110B or equivalent. Reaction mechanisms relevant to enzymic catalysis; approaches and techniques of peptide synthesis and chemical modification of proteins; stereochemistry of enzymic reactions.

Mr. Poppak, Mr. Sigman and the Staff

M253. Proteins and Nucleic Acids.

(Same as Chemistry M253.) Lecture or recitation, four hours. Prerequisites: course 101B (or Chemistry 153) 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

M255. Biological Catalysis.

(Same as Chemistry M255.) Lecture or recitation, four hours. Prerequisites: course 101B (or Chemistry 153), Chemistry 143A, 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

teristics of different enzymes and enzymic reactions of special biological processes. The Staff

256. Seminar in Molecular Biology. (½ course)

Lecture or recitation, one hour. Prerequisite: consent of the instructor. Seminar discussion of current topics in molecular biology. Students will review recent literature in the field. The Staff

M257. Physical Chemistry of Biological Macromolecules. (½ course)

(Same as Chemistry M257.) 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. The Biochemistry of Lipids. (½ course each)

Lecture, two hours. Prerequisites: course 101A, 101B, or equivalent. A study of the biochemistry of lipids including physical and chemical properties, methods of isolation and characterization, biosynthesis and degradation and the relationships of these to the general metabolism of the whole animal in normal and diseased states. To be given alternate years. Mr. Mead, Mr. Howton, Mr. Poppak

262A-262B-262C. 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

M263. Cellular Metabolism.

(Same as Chemistry M263.) Lecture or recitation, three hours. Prerequisites: course 101B (or Chemistry 153), and Chemistry 110A or equivalent. Patterns of biological degradation and synthesis; metabolic interrelationships and control; energetics of metabolism. The Staff

264A-264B-264C. Seminar in Advanced Lipid Biochemistry. (½ course each)

Lecture or recitation, one hour. Prerequisites: 261A, 261B, 261C, or consent of instructor. Advanced topics in lipid biochemistry will be discussed by experts in each area, including those taking the course. Free discussion will be encouraged. Subjects to be covered will be those of current intensive research and interest. To be given in alternate years.

265. Seminar in the Biochemistry of Nucleic Acids. (½ course)

Lecture or recitation, one hour. Prerequisites: Chemistry or Biological Chemistry M253 or equivalent. Biochemistry and chemistry of nucleic acids and nucleotides. Mr. Glitz

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, Mr. Herschman

M267. Nucleic Acid and Protein Biosynthesis. (½ course)

(Same as Chemistry M267.) 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

269. The Biochemistry of Differentiation. (½ course)

Lecture or recitation, two hours. Prerequisites: course 267 or equivalent, basic knowledge of embryology, or consent of instructor. Fundamentals of the biochemical aspects of differentiation and development: cell-specific expression of function, control of enzyme synthesis, metabolism in developing

systems, and the control of gene expression relative to the biochemistry of development.

Mr. Harary, Mr. Herschman

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

■ BIOLOGY

(Department Office, 2203 Life Sciences Building)

Albert A. Barber, Ph.D., *Professor of Cell Biology.*

George A. Bartholomew, Ph.D., *Professor of Zoology.*

John N. Belkin, Ph.D., *Professor of Zoology.*

Jacob B. Biale, Ph.D., *Professor of Plant Physiology.*

Joseph Cascarano, Ph.D., *Professor of Cell Biology.*

Nicholas E. Collias, Ph.D., *Professor of Zoology.*

Frederick Crescitelli, Ph.D., *Professor of Cell Biology.*

Wilbur T. Ebersold, Ph.D., *Professor of Botany.*

Roger O. Eckert, Ph.D., *Professor of Zoology.*

Franz Engelmann, Ph.D., *Professor of Zoology.*

John H. Fessler, Ph.D., *Professor of Molecular Biology.*

Malcolm S. Gordon, Ph.D., *Professor of Zoology.*

Alan D. Grinnell, Ph.D., *Professor of Zoology.*

Karl C. Hamner, Ph.D., *Professor of Botany.*

Thomas R. Howell, Ph.D., *Professor of Zoology.*

Theodore L. Jahn, Ph.D., *Professor of Zoology and Cell Biology.*

Thomas W. James, Ph.D., *Professor of Cell Biology.*

J. Lee Kavanau, Ph.D., *Professor of Zoology.*

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, Ph.D., *Professor of Botany.*

Everett C. Olson, Ph.D., *Professor of Zoology.*

Bernard O. Phinney, Ph.D., *Professor of Botany.*

Charles A. Schroeder, Ph.D., *Professor of Botany.*

Richard W. Siegel, Ph.D., *Professor of Zoology.*

Fritiof S. Sjöstrand, M.D., Ph.D., *Professor of Zoology.*
 Clara M. Szego, Ph.D., *Professor of Zoology.*
 Henry J. Thompson, Ph.D., *Professor of Botany.*
 Peter P. Vaughn, Ph.D., *Professor of Zoology.*
 Boyd W. Walker, Ph.D., *Professor of Zoology.*
 Samuel G. Wildman, Ph.D., *Professor of Botany.*
 David Appleman, Ph.D., *Emeritus Professor of Plant Physiology.*
 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.*
 Arthur W. Haupt, Ph.D., *Emeritus Professor of Botany.*
 Edgar L. Lazier, Ph.D., *Emeritus Professor of Zoology.*
 Orda A. Plunkett, Ph.D., *Emeritus Professor of Botany.*
 Flora Murray Scott, Ph.D., *Emeritus Professor of Botany.*
 Luciano Barajas, M.D., *Associate Professor of Cell Biology.*
 Austin J. MacInnis, Ph.D., *Associate Professor of Cell Biology.*
 Leonard Muscatine, Ph.D., *Associate Professor of Zoology.*
 Park S. Nobel, Ph.D., *Associate Professor of Molecular Biology.*
 Richard K. Orkand, Ph.D., *Associate Professor of Zoology.*
 Dan S. Ray, Ph.D., *Associate Professor of Molecular Biology.*
 Winston A. Salser, Ph.D., *Associate Professor of Molecular Biology.*
 Vladimir Walters, Ph.D., *Associate Professor of Zoology.*
 Clifford F. Brunk, Ph.D., *Assistant Professor of Cell and Molecular Biology.*
 William R. Clark, Ph.D., *Assistant Professor of Cell Biology.*
 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.*
 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 Cell and Developmental Biology.*
 Larry Simpson, Ph.D., *Assistant Professor of Cell Biology.*
 J. Philip Thorner, Ph.D., *Assistant Professor of Molecular Biology.*

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, or any three courses in the Physics 7 series.

Requirements for the Major

Eleven courses, consisting of 5 courses chosen from the designated core list, 2 additional upper division Biology elective courses, and 4 courses which may be chosen from upper division Biology or any upper division courses in Mathematics (except Mathematics 100 through 107), Physics, Chemistry (courses in biochemistry and physical chemistry are especially recommended),

Bacteriology, or courses from the following approved list: Anthropology 130A-130B; Biomathematics 110; Geography 110, 112, 116; Geology 115, 116; Public Health 160B-160C. The College requires that at least 6 upper division courses be taken in the major department. If both Bacteriology 100A and 100C are taken to fulfill core requirements, then only 3 additional courses may be elected from other departments to complete major requirements.

The core consists of 5 courses, one from each of the following groups: (a) Biology 101, 102, 105, 110, Bacteriology 100A; (b) Biology 111, 120, 122, Bacteriology 100C—Bacteriology 100A is a prerequisite for 100C; (c) Biology M132; (d) Biology 138, 144, 146; (e)

Biology 158, 163, 166. Any of these courses not used to fulfill core requirements may be used as Biology electives.

This department has no undergraduate foreign language requirement. However, all students planning graduate work or professional training should remember that many graduate and professional schools recommend or require some training in one or more foreign languages. Specific requirements of the institutions of your choice should be considered in planning your program.

All incoming students (Freshman and Transfers) must see a departmental adviser before they register for classes. In addition, all students majoring in Biology must confer with a departmental adviser by the start of the junior year, and again during the senior year, to make up a curriculum that will best suit their interests. Advising appointments and sample curricula, developed by the staff for various fields of biology, are available from the Biology Student Affairs Office.

Qualified undergraduate students may take graduate courses if they obtain consent of their adviser and the instructor.

Honors in Biology

Requirements for admission to candidacy for Honors in Biology are the same as those required for admission to the Honors Program of the College of Letters and Science. Highest Honors in Biology are awarded to those students who meet the College requirements for honors, and have satisfactorily completed honors research course 190. Honors in Biology are awarded to those students who 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 Biology represent most of the background necessary as preparation for research leading to advanced degrees in Biology, 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 Biology with specialization in the following fields: animal behavior, animal and plant systematics, cell biology, comparative

physiology, developmental biology and embryology, cytology, electron microscopy and ultrastructure, endocrinology, entomology, general physiology, genetics, ichthyology, insect physiology, invertebrate zoology, mammalogy, molecular biology, neuroanatomy, neurophysiology and sense organ physiology, ornithology, parasitology and physiology of parasitism, physiological ecology, plant morphology, plant biochemistry and physiology, plant hormones, population and community ecology, protozoology and protozoan physiology, radiation biology, soils, vertebrate morphology and vertebrate paleontology, and vertebrate physiology.

Work in additional fields may be pursued by qualified students on a limited basis through directed individual studies at the Santa Catalina Marine Biological Laboratory. These fields are: oceanology, comparative physiology of marine organisms, marine ecology, marine botany and physiology, marine invertebrate zoology, and developmental biology of marine organisms. Consult the Student Affairs Office for additional information.

Requirements for the Standard Credential in Secondary Teaching

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 Biology 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 Biology, 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. There is no standard language requirement for the Ph.D. in Biology; the language requirement for each candidate is determined by the sponsor based on the needs of the candidate.

Lower Division Courses

1A-1B. Introductory Biology.

Lecture, three hours; laboratory, three hours. Prerequisite: Chemistry 1A. Offered primarily for majors in Bacteriology, Biology, and other departments of science, as well as premedical and pre dental students. The general principles of biology. The Staff

2. Principles of Biology.

Lecture, three hours; discussion, one hour. Prerequisite: 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

10. Plants and Civilization.

(Formerly numbered Botanical Sciences 10.) Lecture, three hours; lecture-demonstration, one hour. The origin of crop plants; man's role in the development, distribution, and modification of food, fiber, medicinal and other plants in relation to their natural history. Designed for non-majors.

Mr. Schroeder

11. Field Botany.

(Formerly numbered Botanical Sciences 11.) Lecture, two hours; laboratory, six hours; required field trips. An introduction to the systematics, morphology, and ecology of the local flora (native and cultivated). Use of keys for identification; morphological characteristics of common families of vascular plants; plant communities and environmental factors affecting their distribution; emphasis on California. Designed for non-majors.

Miss Mathias

12. Taxonomy and Ecology of Ornamental Plants.

(Formerly numbered Botanical Sciences 12.) Lecture, one hour; laboratory and field trips, six hours. The origin, classification and identification of the more important ornamental plants in southern California with special emphasis on their environmental requirements and adaptation. Designed for non-majors.

Mr. Schroeder

13. Evolution of Life.

(Formerly numbered Zoology 13.) Lecture, three hours; discussion, one hour. Limited to 100 students. Not open to Life Sciences majors. An introduction to biology within the framework of evolutionary theory. The relationships of evolutionary thought to other areas of knowledge and society. Natural selection and the origin of variation are examined in the context of genetics, molecular biology, physiology, phylogeny, population dynamics, behavior and ecology. Stress is laid upon the critical role of historical processes.

Mr. Olson

15. Human Biology.

(Formerly numbered Zoology 15.) Lecture, three hours. Limited to 50 students. A discussion of the morphology and physiology of the human organism. The phylogenetic history and adaptive features of the human body will be emphasized. Subjects which will be included are: nutrition, cardiovascular physiology, nervous systems control, and other subjects as time permits.

Mr. Crescitelli

17. Structural Design and Function of the Human Body.

Lecture, three hours. Not open to majors in the Life Sciences. Review of some basic properties of living matter. Design principles of the organs of the body as adaptation to their function. Human anatomy and physiology applied to practical problems of everyday life, such as sports, industrial work and tool design.

Mr. Sjöstrand

20. Genetic Biology.

Lecture, 2 hours; discussion, 1 hour; laboratory, 2 hours. Not open to premedical or pre dental students or to students in the Life Sciences. Limited enrollment. Mendelian factors, the role of chromo-

somes in heredity, and the role of genes in development and population structure will be presented through lectures, readings, and laboratory exercises with *Drosophila*. Mr. Merriam

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

25. The Oceans.

(Formerly numbered Zoology 25.) Lecture, three hours; discussion, one hour. Not open to students in the sciences. Limited to 40 students. Physical and chemical processes that take place in the oceans with emphasis on their effects on organisms. Mr. Walker

Upper Division Courses

It is assumed that all the preparation for the Biology major has been completed before Upper Division courses in Biology are taken. Students who have not completed this preparation should consult their advisers or the individual instructors as to the advisability of taking any particular course.

101. The Biology of Algae, Lichens, and Fungi.

(Formerly numbered Botanical Sciences 100.) Lecture, two hours; laboratory, six hours. Prerequisite: Biology 1A-1B or consent of the instructor. A survey of the major groups of algae, lichens and fungi, stressing their morphology and development in relation to function.

Mr. Phinney

102. The Biology of Land Plants.

(Formerly numbered Botanical Sciences 101.) Lecture, two hours; laboratory, six hours. Prerequisite: Biology 1A-1B or consent of the instructor. An introduction to the morphology, anatomy and reproduction of the liverworts, mosses, ferns and seed plants. Emphasis is given to their development in relation to function.

Mr. Phinney

103. Taxonomy of Flowering Plants.

(Formerly numbered Botanical Sciences 117.) Lecture, two hours; laboratory and field trips, six hours. The evolution, systematics, and distribution of the families of flowering plants. Morphology, principles of taxonomy, phylogenetic systems, nomenclature, modern methods of investigation.

Miss Mathias

105. Biology of Invertebrates.

(Formerly numbered Zoology 102.) Lecture, three hours; laboratory, four hours plus field trips. Prerequisite: Biology 1A-1B or the equivalent. Introduction to the systematics, evolution, natural history, morphology and physiology of the invertebrates.

Mr. Morin, Mr. Muscatine

106A-106B. Marine Invertebrate Zoology.

(Formerly numbered Zoology 117A-117B.) Prerequisite: course 105 or the equivalent or consent of the instructor. Limited enrollment. Course 106A deals primarily with the systematics, morphology, and natural history of invertebrates. In course 106B the emphasis is on their physiology, biochemistry, and independent laboratory and field investigations.

Mr. Morin, Mr. Muscatine

107. Entomology.

(Formerly numbered Zoology 122.) Lecture, three

hours; laboratory, six hours; field trips. Prerequisite: Biology 1B or consent of the instructor. An introduction to the morphology, ecology and classification of insects. Mr. Belkin

108. Terrestrial Arthropods.

(Formerly numbered Zoology 123.) Lecture, three hours; laboratory, six hours; several field trips. Prerequisite: course 107 or consent of the instructor. Systematics, distribution, and bionomics of hexapods and arachnids. Mr. Belkin

110. Vertebrate Morphology.

(Formerly numbered Zoology 101.) 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

111. Biology of Vertebrates.

(Formerly numbered Zoology 106.) Lecture, three hours; demonstrations, field trips, discussions, four hours. Prerequisite: Biology 1A-1B or the equivalent. The adaptations, behavior, and ecology of vertebrates. Mr. Bartholomew, Mr. Howell

112. Ichthyology.

(Formerly numbered Zoology 125.) Lecture, two hours; laboratory, six hours; field trips. Prerequisite: courses 110 and 111. The systematics, ecology and behavior of fishes, with special emphasis on local marine forms. Mr. Walker

114. Ornithology.

(Formerly numbered Zoology 129.) Lecture, two hours; laboratory, discussion, field trips, six hours. Prerequisite: course 111 and consent of the instructor. Limited enrollment. The systematics, distribution, physiology, behavior and ecology of birds. Mr. Howell

115. Mammalogy.

(Formerly numbered Zoology 130.) Lecture, two hours; laboratory and field trips, six hours. Prerequisite: course 120 or the equivalent and consent of the instructor. The evolution, ecology, behavior and physiology of mammals. The Staff

116. The Evolution of Mammalian Dentitions.

(Formerly numbered Zoology 127.) Lecture, two hours; laboratory, six hours. Prerequisite: consent of the instructor. Enrollment limited to 15. The origin and adaptive radiation of mammalian teeth is considered with special emphasis upon morphological aspects of change relative to function. Tooth histology and embryology are studied. Laboratory work involves study of dental morphology and histology. Mr. Olson

M117. Vertebrate Paleontology.

(Formerly numbered Zoology M126. Same as Geology M117.) Lecture, three hours; laboratory, three hours. Prerequisite: course 110. Recommended: a course in general geology. Limited enrollment. Study of the fossil record of the evolution of the vertebrates. Mr. Vaughn

M118. Paleobotany.

(Formerly numbered Botanical Sciences M118. Same as Geology M118.) Lecture, three hours; laboratory, three hours. Prerequisite: one course in biological science or consent of instructor. Recommended: Geology 2 or equivalent. Survey of mor-

phology, paleobiology, and evolution of vascular and nonvascular plants during geologic time, and particular emphasis on major evolutionary events. Mr. Schopf

120. Evolutionary Biology.

(Formerly numbered Botanical Sciences M104 and Zoology M104.) Lecture, three hours; discussion, one hour. Prerequisite: Biology 1A-1B. Introduction to the mechanics and processes of evolution with emphasis on natural selection, population genetics, speciation, evolutionary rates, and patterns of adaptation. Mr. Cody, Mr. Landenberger, Mr. Thompson

122. Ecology.

(Formerly numbered Botanical Sciences M105 and Zoology M105.) Lecture, three hours; laboratory, three hours. Prerequisite: Biology 1A-1B. Introduction to population and community ecology, with emphasis on the growth and distribution of populations, interactions between species, and the structure, dynamics and functions of communities and ecosystems. Mr. Cody, Mr. Landenberger, Mr. Thompson

123. Animal Distribution.

(Formerly numbered Zoology 138.) Lecture, two hours; discussion, two hours. Prerequisite: course 122 or the equivalent and consent of the instructor. An analysis of the distribution of animals at all levels: local to global; population to major taxonomic groups. The Staff

124. Field Ecology.

(Formerly numbered Zoology 140.) Lecture, two hours; laboratory, six hours; weekend field trips. Prerequisite: course 120 or 122 and consent of the instructor. Field and laboratory research in ecology; the collection, analysis and write-up of numerical data. In odd-numbered years there will be a single ten-day field trip between the Winter and Spring Quarters. Mr. Cody

125. Plant Population Ecology.

(Formerly numbered Botanical Sciences 153.) Lecture, two hours; laboratory, six hours; field trips. Prerequisite: course 120 or 122 and consent of the instructor. A study of genetic and ecological variation, structure, and distribution of plant populations emphasizing field studies of selected populations and ecosystems. Mr. Thompson

126. Analysis of Ecological Data.

(Formerly numbered Zoology 139.) 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

M127. Soil-Plant Relations.

(Formerly numbered Botanical Sciences M127. Same as Geography M127.) Lecture, three hours; laboratory, two hours; field trip. Prerequisites: Biology 1A-1B or the equivalent, or consent of instructor. A general treatment of soil development and morphology, its physical and chemical properties as they relate to plant growth; soil resources, management and conservation. Laboratory consists of field trip, map study, problem solving, reporting on library research projects. Mr. Lunt

129. The Behavior of Animals.

(Formerly numbered Zoology 164.) Lecture, four

hours. Prerequisite: Biology 1A-1B. Ecological significance, underlying mechanisms, and evolution of behavior, with special reference to animal sociology under natural conditions. Mr. Collias

130. Behavior Research Problems.

(Formerly numbered Zoology 165.) 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

M132. Comparative Genetics.

(Formerly numbered Botanical Sciences M107 and Zoology M107. Same as Bacteriology M132.) Lecture, three hours; discussion/demonstration, one hour. 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

134. Human Genetics.

(Formerly numbered Zoology 120.) Lecture, three hours; discussion, one hour. Prerequisite: Biology 1A-1B with grade of C or better. Offered primarily to premedical and predoctoral students not majoring in the Life Sciences. This course will fulfill the genetics requirement for Biology 138. Not open to students who have had Bacteriology or Biology M132. A basic course in genetics using human examples. The Staff

136A-136B-136C. Seminar in Genetics. (½ course each)

(Formerly numbered Zoology 176.) Discussion, two hours. Prerequisite: course M132 and consent of the instructor. Undergraduate seminar in genetics; reading and group discussions of current research. Will be offered each quarter; emphasizing algal and fungal genetics (Fall), behavioral genetics (Winter), and developmental genetics (Spring).

Mr. Ebersold, Mr. Merriam, Mr. Siegel

138. Developmental Biology.

(Formerly numbered Zoology 115.) Lecture, four hours. Prerequisites: Chemistry 4C-6C; Biology M132 or 134, which may be taken concurrently. Synopsis of fundamental concepts in embryology and a survey of current topics in developmental biology. Mr. Clark, Mr. Denny, Mr. O'Connor

139. Introductory Laboratory in Developmental Biology.

(Formerly numbered Zoology 116.) Lecture, two hours; laboratory, six hours. Prerequisites: course 138 and consent of the instructor. Introductory course in developmental biology including cell and organ culture and biochemical analysis of developing systems. Mr. Clark, Mr. Denny, Mr. O'Connor

140. Plant Development and Differentiation.

(Formerly numbered Botanical Sciences 151.) Lecture, two hours; laboratory, four hours. Prerequisite: courses 101 and 102. 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, Mr. Schroeder

142A-142B-142C. Seminar on Topics in Developmental Biology. (½ course each)

(Formerly numbered Zoology 178.) Discussion,

two hours. Prerequisite: course 138 and consent of the instructor. Undergraduate seminar on topics in developmental biology. Reading and group discussions of current research. Will be offered each quarter; emphasizing organ differentiation and tissue culture (Fall), gametogenesis and fertilization (Winter), and chemical regulations (Spring).

Mr. Clark, Mr. Denny, Mr. O'Connor

144. Introduction to Molecular Biology.

(Formerly numbered Zoology 118.) 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.

Mr. Brunk, Mr. Fessler, Mr. Ray, Mr. Salsner

145A-145D. Molecular Biology Laboratory.

(Formerly numbered Zoology 118A.) Laboratory, twelve hours. Prerequisite: consent of the instructor. It is highly desirable that the student have already taken course 144. A course in experimental molecular biology in which the student carries out original research under supervision. Space available is limited, and arrangements must be made in advance with the instructor. The Staff

146. Physicochemical Biology.

(Formerly numbered Botanical Sciences 113.) Lecture, three hours; discussion, one hour. Recommended: Biology 1A-1B, Chemistry 4A-4B-4C and 6A-6B-6C, Physics 6A-6B-6C, Mathematics 3A-3B-3C. A physicochemical analysis of the physiology of cells and organelles with emphasis on membranes, thermodynamics of solute and water movement, light absorption, primary events of photosynthesis, and subcellular energy transduction. Mr. Nobel

147. Physicochemical Biology Laboratory. (½ course)

(Formerly numbered Botanical Sciences 114.) Laboratory, six hours. Prerequisite: course 146 and/or consent of the instructor. An advanced laboratory course illustrating the physicochemical principles developed in biology. Students will examine plant pigments and photochemical reaction centers, measure membrane potentials, and then undertake an individual project. Mr. Nobel, Mr. Thorner

148. Topics in Physical Chemistry for Molecular Biology. (½ course)

(Formerly numbered Zoology 155.) 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

151. Proteins and Nucleic Acids of Higher Plant Chloroplasts.

(Formerly numbered Botanical Sciences 124.) Lecture-conference, one hour; laboratory, eight hours. Prerequisites: courses 146, 163 and/or consent of the instructor. Emphasis on laboratory procedures for identification and characterization of chloroplast proteins and nucleic acids. Mr. Wildman

153. Histology.

(Formerly numbered Zoology 161.) Lecture, two hours; laboratory, six hours. Prerequisite: consent of the instructor. An introduction to descriptive and functional histology, using light and electron micro-

scope information. Discussion of histological research methods. Mr. Barajas

154. Functional Ultrastructure of Cells.

(Formerly numbered Zoology 111.) Lecture, three hours. Prerequisites: 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. Sjöstrand

155. Analytical Microscopy and Cytology. (½ course)

(Formerly numbered Zoology 160.) 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

156. General and Cell Physiology.

(Formerly numbered Zoology 108.) Lecture, two hours; laboratory, six hours. Prerequisites: 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

159. Experimental Cell Biology.

(Formerly numbered Zoology 147.) Lecture, two hours; laboratory, six hours. Prerequisites: course 158 and consent of the instructor. The physiology of control mechanisms and the integration of metabolic systems at the cellular level. Individual experiments will be encouraged. Mr. Cascarano, Mr. James

161. General Physiology.

(Formerly numbered Zoology 145.) Lecture, three hours. Prerequisites: 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

163. Plant Physiology.

(Formerly numbered Botanical Sciences 109.) Lecture-conference, three hours; laboratory, three hours. Prerequisites: Biology 1A-1B, Chemistry 1A-1B or the equivalent. Recommended: Chemistry 4A-4B-4C and 6A-6B-6C. Water movements within the plant body and between the plant and its environment. Soil genesis, characteristics and plant-soil interrelations. Salt movement across membranes and through tissues. Hormonal control of growth and development. Photomorphogenesis. Photoperiodism and flowering. Photochemical and physiological aspects of photosynthesis. Mr. Laties, Mr. Lunt, Mr. Thornber

164. Photoperiodism and Related Phenomena. (½ course)

(Formerly numbered Botanical Sciences 128.) Lecture, two hours. Prerequisites: Chemistry 4A-4B-4C and 6A-6B-6C or the equivalent. Flowering process, photoperiodism, endogenous rhythms, the biological clock and related subjects. Mr. Hammer

166. Animal Physiology.

(Formerly numbered Zoology 109.) 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 course 158. An introduction to physiological principles with emphasis on organ systems and intact organisms. The Staff

168. Insect Physiology.

(Formerly numbered Zoology 124.) Lecture, two hours; laboratory, six hours. Prerequisite: course 158 or 166 or the equivalent. Survey of the physiology of insects with emphasis on functional adaptations. Mr. Engelmann

169. Comparative Physiology.

(Formerly numbered Zoology 143.) Lecture, three hours; laboratory, four hours. Prerequisite: courses 158 and 166. A detailed analysis of selected aspects of invertebrate and vertebrate physiology. Mr. Gordon

171. Introduction to the Nervous System.

(Formerly numbered Zoology 157A.) Lecture, three hours; discussion, one hour. Prerequisite: course 166 or consent of the instructor. Structural and functional principles of the nervous system as a general biological phenomenon. Consideration 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

172. Introductory Laboratory in Neurophysiology. (2 courses)

(Formerly numbered Zoology 157B.) Laboratory, sixteen hours. Prerequisite: course 171 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

173. Anatomy and Physiology of Sense Organs.

(Formerly numbered Zoology 159.) Lecture, three hours; discussion, one hour. Prerequisite: course 171 or the equivalent. The anatomy and physiology of the sense organs. Comparative aspects will be emphasized. Mr. Eckert, Mr. Grinnell, Mr. Orkand

177. General Endocrinology.

(Formerly numbered Zoology 151.) Lecture, three hours. Prerequisites: biochemistry; course 158 or 166 or the equivalent. Principles of chemical integration in biological systems. Miss Szego

178. Phytohormones. (½ course)

(Formerly numbered Botanical Sciences 126.) Lecture, two hours. Prerequisites: Chemistry 4A-4B-4C and 6A-6B-6C or the equivalent. A comparative survey of the physiological functions of the auxins, gibberellins, kinins and abscisins. These classes of compounds will be considered in terms of physiological effects, interaction, biosynthetic origin, metabolism, transport, and mechanism of action. Mr. Phinney

179. Invertebrate Endocrinology.

(Formerly numbered Zoology 150.) Lecture, three hours. Prerequisite: course 158 or 166 or consent of the instructor. A comprehensive treatment of invertebrate endocrinology. Mr. Engelmann

181. Parasitology and Symbiosis.

(Formerly numbered Zoology 121.) 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 and helminth parasites, including those of man.

Mr. MacInnis

182. Experimental Parasitology.

(Formerly numbered Zoology 133.) Laboratory, eight hours. Prerequisite: consent of the instructor. Introduction to the use of parasites in experiments concerning basic biological problems and to problems concerning parasitism.

Mr. MacInnis

184. Mathematical Ideas in Biology.

(Formerly numbered Zoology 119.) Lecture, three hours; discussion, one hour. Prerequisites: Mathematics 12A or 13A or consent of the instructor. Use of elementary mathematics to illustrate the application of mathematical reasoning to topics in genetics, physiology, morphogenesis and evolution. System kinetics and diffusion processes are also considered.

Mr. Landenberger

186. Seminar on Biology and Society. (½ course)

(Formerly numbered Zoology 185.) 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.

Mr. Gordon, Mr. Nobel

189A-189B. Biology for Majors in Physical Sciences and Engineering.

(Formerly numbered Biology 181A-181B.) 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 fulfillment of two quarters of the life sciences requirement 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

190. Honors Research in Biology. (½ to 1 course)

(Formerly numbered Zoology 190.) Prerequisite: senior standing and permission of the departmental student affairs committee. Individual research designed to broaden and deepen the student's knowledge of some phase of Biology. Must be taken for at least two quarters and for a total of at least two courses. A thesis is required for completion of the final course.

The Staff

199. Special Studies. (½ to 1 course)

(Formerly numbered Zoology 199 and Botany 199.) Prerequisite: consent of the instructor. May be repeated for a total of one course credit toward the bachelor's degree. May not be applied toward fulfillment of the Biology major.

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. Advanced Plant Taxonomy.

(Formerly numbered Botanical Sciences 215.) Lecture, two hours; laboratory, four hours; field trips.

The principles, concepts, and methods of plant taxonomy. Mr. Lewis, Miss Mathias, Mr. Thompson

202. Principles of Animal Taxonomy.

(Formerly numbered Zoology 213.) Lecture, three hours. Taxonomic concepts, principles, and methods.

Mr. Belkin

204A-204F. Advanced Plant Morphology.

(½ course each)

(Formerly numbered Botanical Sciences 219A-219F.) 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.

Mr. Phinney, Mr. Schroeder

205. Marine Invertebrate Biology.

(Formerly numbered Zoology 248.) *This course is given at the Santa Catalina Marine Biological Laboratory.* Functional morphology, life histories, and systematics of marine invertebrates of all major and most minor taxa; emphasis on the living animal and its habitat.

The Staff

206. Advanced Ichthyology.

(Formerly numbered Zoology 212.) Lecture, three hours; laboratory, three hours. Prerequisite: course 112 or consent of the instructor. The higher classification and functional morphology of fishes from an evolutionary point of view.

Mr. Walters

208. The Biology of Aquatic Mammals.

(Formerly numbered Zoology 244.) Lecture, three hours; laboratory, three hours; weekend field trips. Enrollment limited to 20 students. A course in the ecology, systematics, distribution, behavior, physiology and anatomy of marine mammals.

The Staff

209. Field Study of Vertebrate Fossils.

(Formerly numbered Zoology 217.) 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

211. Mechanisms of Evolution.

(Formerly numbered Botanical Sciences M204 and Zoology M204.) Lecture, two hours; individual study. Prerequisites: courses 120 and M132. Genetic mechanisms of evolutionary change.

Mr. Lewis

212. Conceptual Models in Ecology.

(Formerly numbered Zoology 215.) Prerequisites: course 122 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

213. Community Ecology.

(Formerly numbered Zoology 216.) Lecture, three hours. Prerequisites: course 122 or 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

214. Physiological Ecology. (½ course)

(Formerly numbered Zoology 218.) Lecture. Prerequisite: course 111. A detailed consideration of the

role of physiology and behavior in the autecology of organisms in natural environments.

Mr. Bartholomew

216. Advanced Plant Ecology.

(Formerly numbered Botanical Sciences 217.) 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.

Mr. Thompson

217. Marine Ecology.

(Formerly numbered Zoology 246.) This course is given at the Santa Catalina Marine Biological Laboratory. Structure, diversity and energetics of marine communities; behavior, population dynamics, and biogeography of component species; associated oceanography and geology.

The Staff

218. Oceanology.

(Formerly numbered Zoology 245.) This course is given at the Santa Catalina Marine Biological Laboratory. Ecology and dynamics of pelagic and benthic associations; physio-chemical properties of seawater and marine substrates and their biological significance; qualitative and quantitative methods of oceanology.

The Staff

219. Studies of Animal Behavior.

(Formerly numbered Zoology 238.) Discussion, two hours; laboratory, six to eight hours. Prerequisites: course 129 and consent of the instructor. Field and laboratory studies of selected problems in animal behavior.

Mr. Collas

M220. Gene Structure and Function.

(Formerly numbered Botanical Sciences M202 and Zoology M202. Same as Microbiology M220 and Bacteriology M220.) Lecture and discussion, three hours. Prerequisites: course M132 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

222A-222F. Topics in Genetics.

(Formerly numbered Botanical Sciences M205A-205F and Zoology M205A-205F.) Lecture. Prerequisite: course M132. Intensive study of selected topics.

The Staff

223A-223D. Advanced Genetics Laboratories.

(Formerly numbered Zoology 208A-208F.) Laboratory, nine hours. Prerequisite: course M132 or equivalent and consent of the instructor. Open to qualified undergraduates. Each course will be offered independently of the others as student demand warrants. 223A: *Drosophila* behavior genetics; isolation and genetic analysis of mutants defective in visual behavior — phototaxis/countercurrent distribution (Merriam). 223B: *Neurospora* developmental genetics; identification and characterization of genes that modify behavior, metabolism and morphogenesis (Siegal). 223C: *Chlamydomonas* genetics; general techniques (Ebersold). 223D: *Gibberella* physiological genetics; isolation and identification of mutants that block steps in the biosynthesis of the plant hormones, the gibberellins (Phinney).

The Staff

224. Developmental Biology of Marine Organisms.

(Formerly numbered Zoology 249.) This course is

given at the Santa Catalina Marine Biological Laboratory. Descriptive and experimental studies of developmental stages of marine plants and animals; patterns of reproductive biology; larval biology; metamorphosis.

the Staff

225. Biochemical Analysis of Development.

(Formerly numbered Zoology 210.) Lecture-discussion, two hours. Prerequisites: course 138 and Chemistry 4C and 6C or the equivalent. A discussion of current topics and problems in the biochemical analysis of developmental phenomena.

Mr. Denny

226. Advanced Laboratory in Developmental Biology.

(½ course)

(Formerly numbered Zoology 211.) Laboratory, six hours. Prerequisites: course 138 or 225 and Chemistry 4C and 6C or the equivalent. Laboratory problems in developmental biology.

Mr. Denny

M227. Chromosome Structure and Replication.

(Formerly numbered Botanical Sciences M203 and Zoology M203. Same as Microbiology M227 and Bacteriology M227.) Prerequisites: course M132 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. Brunk, Mr. Ray

229. Structural Macromolecules.

(Formerly numbered Zoology 208.) 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

M230. Molecular Biology Laboratory.

(1½ courses)

(Formerly numbered Zoology M209. Same as Microbiology M230 and Bacteriology M230.) Prerequisite: consent of the instructor. Lecture, two hours; laboratory, twelve hours. Selected experimental approaches in molecular biology. The current emphasis is on the study of protein synthesis in cell free systems, and the study of repressor molecules.

Mr. Salser

232. Topics in Histology.

(Formerly numbered Zoology 240.) Lecture, two hours; laboratory, six hours. The structure of cells viewed as parts of multicellular functional units. The course will include information obtained by light and electron microscopic techniques.

Mr. Barajas

M233A-233B-233C. Electron Microscopy.

(Formerly numbered Zoology M241A-241B-241C. Same as Microbiology M233A-233B-233C and Bacteriology M233A-M233B-M233C. 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 M233B emphasizes thin sectioning and related methods. Course M233C includes methods and principles of high resolution electron microscopy.

Mr. Barajas, Mr. Eiserling, Mr. Sjöstrand

235. Advanced General Physiology.

(Formerly numbered Zoology 219.) Lecture, three

hours. Prerequisite: course 158 or 161. Discussion of specific topics such as excitation, conduction, physiology of blood, muscle contraction, etc. Students will participate in giving reports. Mr. Crescitelli

236A. Advanced Cell Physiology. (½ course)

(Formerly numbered Zoology 221A.) Lecture, two hours. Prerequisite: course 158. The physiology of the cell membrane, including permeability, electrical, optical, and mechanical properties, and selective cytoplasmic accumulation of nonelectrolytes and ions. Mr. Jahn

236B. Advanced Cell Physiology. (½ course)

(Formerly numbered Zoology 221B.) Lecture, two hours. Prerequisite: course 236A. Theories of the origin of bioelectromotive force, including active transport of ions; effects of polarizing currents. Mr. Jahn

237. Physiology of the Protozoa. (½ course)

(Formerly numbered Zoology 223.) Lecture, two hours. Recommended: course 184. Protoplasmic structure, locomotion, and behavior, and the mechanisms of environmental effects (light, electricity, ions, etc.) thereon. Mr. Jahn

238. Function and Biogenesis of Subcellular Organelles.

(Formerly numbered Zoology 224.) Lecture, three hours. Prerequisites: courses 154 and 158, 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

239. Physiology of Circulation.

(Formerly numbered Zoology 229.) 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

240. Physiology of Marine Animals.

(Formerly numbered Zoology 247.) *This course is given at the Santa Catalina Marine Biological Laboratory.* Lecture and laboratory studies on cellular, tissue, organ, and animal physiology; regulatory biology; metabolic characteristics of cells; energy transformations. The Staff

241. Laboratory in Advanced Electrophysiology.

(2 courses)

(Formerly numbered Zoology 237.) Laboratory, twelve hours. Prerequisite: course 172 or equivalent and consent of the instructor. In-depth involvement in individual research projects under staff guidance. Approximately two projects each quarter. Course may be repeated twice. Mr. Eckert, Mr. Grinnell, Mr. Orkand

242. Topics in Neurobiology.

(Formerly numbered Zoology 235.) Lecture, three hours. Prerequisite: course 171 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

243. The Vertebrate Eye.

(Formerly numbered Zoology 227.) 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

244. Advanced Insect Physiology.

(Formerly numbered Zoology 226.) Lecture, two hours; laboratory, five hours. Prerequisite: course 168 or consent of the instructor. A detailed discussion of current problems in insect physiology. Advanced laboratory. Mr. Engelmann

246. Principles of Lipid Metabolism.

(Formerly numbered Zoology 230.) Lecture, three hours; laboratory, six hours. Prerequisite: Chemistry 153 or consent of the instructor. Extensive investigation into the synthesis and catabolism of selected lipid moieties. Mr. O'Connor

247. Cellular Immunology.

(Formerly numbered Zoology 220.) Lecture, three hours. Prerequisite: Bacteriology 111 or the equivalent, or consent of the instructor. Intensive survey of topics in cellular immunology including: delayed hypersensitivity; graft vs. host reactions; transplantation and tumor immunity; receptor sites; cell interactions; enhancement; suppression and tolerance; and *in vitro* systems. Reading of scientific literature will be stressed. Mr. Clark

249. Biochemistry of Parasitism.

(Formerly numbered Zoology 233.) 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

251. Seminar in Plant Systematics. (½ course)

(Formerly numbered Botanical Sciences 255A-255B-255C.) Mr. Lewis, Miss Mathias

253. Seminar in Plant Structure. (½ course)

(Formerly numbered Botanical Sciences 253A-253B-253C.) Mr. Phinney

255. Seminar in Invertebrate Zoology. (½ course)

(Formerly numbered Zoology 253.) Mr. Muscatine

256. Seminar in Entomology. (½ course)

(Formerly numbered Zoology 254.) Mr. Belkin

258. Seminar in Ichthyology. (½ course)

(Formerly numbered Zoology 256.) Mr. Walker, Mr. Walters

260. Seminar in Biology of Terrestrial Vertebrates. (½ course)

(Formerly numbered Zoology 258.) Mr. Bartholomew, Mr. Howell

261. Seminar on Aquatic Mammals. (½ course)

(Formerly numbered Zoology 259.) The Staff

262. Seminar in Vertebrate Paleontology. (½ course)

(Formerly numbered Zoology 260.) Mr. Vaughn

264. Evolutionary Concepts. (½ course)

(Formerly numbered Zoology 278.) 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

266. Seminar in Plant Ecology. (½ course)

(Formerly numbered Botanical Sciences 252A-252B-252C.) Mr. Thompson

268. Seminar in Population Biology. (½ course)
(Formerly numbered Zoology 261.)
Mr. Cody, Mr. Landenberger

270. Seminar in Environmental Physiology. (½ course)
(Formerly numbered Zoology 262.)
Mr. Bartholomew

272. Seminar in Marine Biology. (½ course)
(Formerly numbered Zoology 263.)
Mr. Gordon, Mr. Muscatine

274. Seminar on Animal Behavior. (½ course)
(Formerly numbered Zoology 264.) Mr. Collias

275. Seminar on Behavior Research Problems.
(Formerly numbered Zoology 265.) Lecture, three hours; laboratory, two hours. Prerequisite: course 130.
Mr. Kavanau

277. Seminar in Genetics. (½ course)
(Formerly numbered Botanical Sciences 258A-258B-258C and Zoology 251.)
Mr. Ebersold, Mr. Merriam, Mr. Siegel

279. Seminar in Developmental Biology. (½ course)
(Formerly numbered Zoology 252.) Mr. Denny

281. Seminar in Current Topics in Molecular Biology. (½ course)
(Formerly numbered Botanical Sciences M250 and Zoology M250.) Mr. Brunk, Mr. Fessler, Mr. Ray

282. Seminar in Molecular Biology. (½ course)
(Formerly numbered Zoology 276.) The Staff

284. Seminar on Extranuclear DNA. (½ course)
(Formerly numbered Zoology 277.)
Mr. Brunk, Mr. Simpson

286. Seminar in Cell Physiology. (½ course)
(Formerly numbered Zoology 268.) Mr. Jahn

287. Seminar in Comparative Cell Physiology. (½ course)
(Formerly numbered Zoology 274.)
Mr. Barber, Mr. Cascarano, Mr. James

288. Seminar in Physiology of Microorganisms. (½ course)
(Formerly numbered Zoology 267.) Mr. Jahn

289. Seminar in Plant Physiology. (½ course)
(Formerly numbered Botanical Sciences 254A-254B-254C.) Mr. Biale, Mr. Laties, Mr. Nobel

290. Seminar in Comparative Physiology. (½ course)
(Formerly numbered Zoology 266.) Mr. Gordon

291. Seminar in Physiology and Biochemistry of Arthropods. (½ course)
(Formerly numbered Zoology 270.) 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

293. Seminar in Cardiovascular Problems. (½ course)
(Formerly numbered Zoology 275.) Mr. Cascarano

295. Seminar in Neurophysiology. (½ course)
(Formerly numbered Zoology 273.)
Mr. Eckert, Mr. Grinnell, Mr. Orkand

297. Seminar in Endocrinology. (½ course)
(Formerly numbered Zoology 271.) Miss Szego

299. Seminar in Parasitology. (½ course)
(Formerly numbered Zoology 255.) Mr. MacInnis

Professional Course

370. Materials and Methods for Teaching Life Sciences.

Lectures, demonstrations, field trips. Prerequisites: major in biological sciences, senior or graduate standing, and one of the following courses: Biology 21 or 120. The Staff

Individual Study and Research

The conduct of each of the courses listed below is supervised by a member of the faculty. He or she is identified by letter code as follows: LB, Luciano Barajas; AB, Albert A. Barber; GB, George A. Bartholomew; JB, John N. Belkin; BB, Jacob B. Biale; CB, Clifford F. Brunk; JC, Joseph Cascarano; MC, Martin L. Cody; NC, Nicholas E. Collias; FC, Frederick Crescitelli; WC, William R. Clark; PD, Paul C. Denny; WE, William T. Ebersold; RE, Roger O. Eckert; FE, Franz Engelmann; JF, John H. Fessler; MG, Malcolm S. Gordon; AG, Alan D. Grinnell; KH, Karl C. Hamner; TH, Thomas R. Howell; TJ, Theodore L. Jahn; WJ, Thomas W. James; LK, J. Lee Kavanau; DL, Donald Landenberger; GL, George G. Laties; HL, F. Harlan Lewis; RL, O. Raynal Lunt; AM, Austin J. MacInnis; MM, Mildred E. Mathias; JM, John R. Merriam; GM, James G. Morin; LM, Leonard Muscatine; PN, Park S. Nobel; JO, John D. O'Connor; EO, Everett C. Olson; RO, Richard K. Orkand; BP, Bernard O. Phinney; DR, Dan S. Ray; WS, Winston A. Salser; AS, Charles A. Schroeder; RS, Richard W. Siegel; LS, Larry Simpson; FS, Fritiof S. Sjöstrand; CS, Clara M. Szego; HT, Henry J. Thompson; PT, J. Philip Thornber; PV, Peter P. Vaughn; BW, Boyd W. Walker; VW, Vladimir Walters; SW, Samuel G. Wildman.

596AA-596ZZ. Directed Individual or (Tutorial) Studies. (½ to 2 courses) The Staff

596F. Directed Individual (or Tutorial) Studies. (½ to 2 courses)

Directed individual (or tutorial) studies at the Santa Catalina Island Marine Laboratory. The Staff

587AA-587ZZ. Preparation for Comprehensive Examination for the Master's Degree or Qualifying Examination for the Ph.D.
(½ to 1 course)

The Staff

588AA-588ZZ. Master's Thesis Research and Writing. (½ to 2 courses)

The Staff

589AA-589ZZ. Doctoral Dissertation Research and Writing. (½ to 2 courses)

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).*

Olive Jean Dunn, Ph.D., *Professor of Biostatistics and Biomathematics.*

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.*

Abdelmonem A. Afifi, Ph.D., *Associate Professor of Biostatistics and Biomathematics.*

Virginia A. Clark, Ph.D., *Associate Professor of Biostatistics and Biomathematics.*

V. Krishna Murthy, Ph.D., *Adjunct Associate Professor of Biomathematics.*

Robert I. Jennrich, Ph.D., *Associate Professor of Biomathematics and Mathematics.*

Carol M. Newton, M.D., Ph.D., *Associate Professor of Biomathematics.*

Photios A. Anninos, Ph.D., *Assistant Professor of Biomathematics in Residence and Assistant Research Anatomist.*

Mary Anne Campbell, Ph.D., *Assistant Professor of Biomathematics in Residence and Assistant Professor of Psychiatry in Residence.*

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.*

Alston S. Householder, Ph.D., *Visiting Professor of Biomathematics.*

M. Ray Mickey, Ph.D., *Research Statistician and Lecturer in Biomathematics.*

Sankaranarayanan Raman, Ph.D., *Assistant Research Statistician.*

Lionel D. Rovner, B.S.E.E., *Lecturer in Biomathematics and Anatomy.*

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, much 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)

Prerequisite: 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. Jennrich 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

206. Modeling of Cellular Systems.

Prerequisites: differential equations, probability. Highly recommended: programming skills. Stochastic, deterministic, and computer simulation models are developed for dividing and differentiating cellular systems. Biological assumptions, indications for various approaches, and relationships to laboratory research methods are emphasized. Miss Newton

207. Modeling in Genetic Analysis.

Prerequisites: graduate standing and consent of instructor. Basic concepts of human genetics with emphasis on methods of computer-oriented genetic segregation analysis, genetic linkage, polygenic (quantitative) models, and population structure. Miss Campbell

208. Modeling and Analytical Methods in the Neurosciences.

Prerequisite: differential equations. For biologists (esp. neuroscientists), but open to other science majors. Mathematical and computer approaches for modeling and developing neural theory are applied to basic neurophysiological phenomena and neural models. Appropriate simulation and statistical techniques are also presented. Mr. Anninos

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

596. Directed Individual Study or Research in Biomathematics. (½ to 2 courses)

This course will serve for individual study on topics not yet covered by the offerings of the department. This course can be taken several times for credit when different topics are covered. A letter grade will be used. The Staff

■ BOTANICAL SCIENCES

The departments of Botanical Sciences and Zoology have now merged to form the Department of Biology. Students currently enrolled as majors in Botanical Sciences or Zoology may complete requirements as stated in the 1971-1972 General Catalog (or the Supplement to the 1971-1972 General Catalog), or they may petition to change their majors to Biology.

Advising appointments and sample curricula are available in the Biology Student Affairs Office.

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 management. 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) Mathematics: Mathematics 1 (if less than three years of high school mathematics); (2) English and speech: English 1 (or proficiency examination—in addition to Subject A examination) and Speech 1; (3) American History and Institutions: Economics 10 or approved alternative; (4) Breadth Requirements: Satisfy breadth requirements of College of Letters and Science, see pages 72-74.

Lower Division Requirements for Major. Economics 1, 2, Management 1A, 1B.

Upper Division Requirements. (1) Economics 101A, 101B, 102, 160; three courses from Economics 107, 130, 150, 170, 180, 190; (2) Management 108, 109 or 405, 113A, 115A or Economics 140; Management 120, 130; three courses from Management 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 Management (1) Fourth or Fifth Year Courses: Education 100 or M108, 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 Management; 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 MANAGEMENT, 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 W. G. Young Hall)

- Frank A. L. Anet, Ph.D., *Professor of Chemistry.*
 Daniel E. Atkinson, Ph.D., *Professor of Chemistry.*
 Kyle D. Bayes, 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.*
 William G. McMillan, Jr., 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).*
 Roberts A. Smith, Ph.D., *Professor of Chemistry.*
 Kenneth N. Trueblood, Ph.D., *Professor of Chemistry.*
 **John T. Wasson, 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.*
 James D. McCullough, Ph.D., *Emeritus Professor of 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.*
 David S. Eisenberg, Ph.D., *Associate Professor of Molecular Biology in Chemistry.*
 Charles M. Knobler, Ph.D., *Associate Professor of Chemistry.*
 John P. McTague, Ph.D., *Associate Professor of Chemistry.*
 Malcolm F. Nicol, Ph.D., *Associate Professor of Chemistry.*
 Craig W. Deutsche, Ph.D., *Assistant Professor of Chemistry.*
 David A. Evans, Ph.D., *Assistant Professor of Chemistry.*
 Andrew U. Hazi, Ph.D., *Assistant Professor of Chemistry.*
 John M. Jordan, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*
 Jerome V. V. Kasper, Ph.D., *Assistant Professor of Chemistry.*
 Michael W. Konrad, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*
 Julius Rebek, Jr., Ph.D., *Assistant Professor of Chemistry.*
 Lawrence T. Scott, Ph.D., *Assistant Professor of Chemistry.*

** Member of the Institute of Geophysics and Planetary Physics.

2 Absent on leave, Fall Quarter, 1972.

* Absent on leave, Winter Quarter, 1973.

* Absent on leave, Spring Quarter, 1973.

Charles E. Strouse, Ph.D., *Assistant Professor of Chemistry.*

Jeffrey I. Zink, Ph.D., *Assistant Professor of Chemistry.*



****George C. Kennedy, Ph.D., *Professor of Geochemistry and Geology.***

Lawrence H. Levine, Ph.D., *Lecturer in Chemistry.*

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 1972-1973, the Preliminary Examination in Chemistry is scheduled on September 18, 1972, for the Fall Quarter; January 3, 1973, for the Winter Quarter; and March 28, 1973, 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 W. G. Young Hall (Chemistry Building) about two weeks before the announced date of the examination.

The Majors in Chemistry

There are three majors available to the student interested in Chemistry: the regular Chemistry major, the Biochemistry major, and the General Chemistry major. Each of these programs is outlined below. Students are urged to seek help and advice in the Chemistry Undergraduate Office, Room 2356 W. G. Young Hall (Chemistry Building).

Chemistry Major

For students who intend to pursue a career in Chemistry. Designed to provide a strong background in physical and organic chemistry with at least one elective from another area of chemistry.

Preparation for the Major

Required: Chemistry 1A, 1B, 1C, 4A, 4B, 4C, 6A, 6B, 6C; Physics 7A, 7B, 7D; Mathe-

matics 11A, 11B, 11C, 13A, and one course chosen from 12A, 13B, or 13C. Another course, directly related to a student's career objectives, may be substituted for the fifth mathematics course upon approval of the Undergraduate Adviser. The mathematics requirement may also be satisfied by 11A, 11B, 11C, 12A, 12B, and 12C. 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 134, 136, 144, 154, 174A, and 184; 2) one course in analytical chemistry, biochemistry, or inorganic chemistry selected from courses 153, 154, 173A, 173B, 174A, 174B, 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 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.

BIOCHEMISTRY MAJOR

The major in Biochemistry is intended for students preparing for careers in biochemistry or in other fields requiring extensive preparation in both chemistry and biology.

Preparation for the Major

Chemistry 1A, 1B, 1C, 4A, 4B, 4C, 6A, 6B, 6C; Mathematics 11A, 11B, 11C, 13A; three

****** Member of the Institute of Geophysics and Planetary Physics.

courses from Physics 6A, 6B, 6C, 7A, 7B, 7C, 7D*; Biology 1A, 1B.

Major

Chemistry 133A, 133B, 110A, 110B, 153, and 154; five upper division courses in life science approved by the Biochemistry Undergraduate Adviser, normally to include at least one course each in the areas of genetics, physiology, and microbiology, and one dealing with some aspect of biological structure.

GENERAL CHEMISTRY MAJOR

The major in General Chemistry is intended for students who wish to acquire considerable chemical background in preparation for careers outside chemistry. The requirements are accordingly quite exible. It may be appropriate for some students who plan to enter professional schools, such as those of medicine, dentistry, or public health.

Preparation for the Major

Chemistry 1A, 1B, 1C, 4A, 4B, 4C, 6A, 6B, 6C; Mathematics 11A, 11B, 11C, 13A; three courses from Physics 6A, 6B, 6C, 7A, 7B, 7C, 7D.*

Major

Six upper division courses in chemistry, including at least one in physical chemistry and at least two with laboratory work; six additional upper division courses. A 2.0 average is required in all upper division chemistry courses. The program should be coherent in terms of the student's interests and objectives, and must be approved by the Chemistry Undergraduate Adviser.

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 should consult the Chemistry Undergraduate Adviser. If he has completed one or more semesters of quantitative analysis and one or two semesters of organic chemistry, with lab, 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,

* If Physics courses from both the 6 and 7 series are taken, undue duplication must be avoided.

course 131 is required for admission to courses 133A, 136, and 144, although it may be taken concurrently with course 133A. Transfer students should consult the Chemistry Undergraduate Adviser for assistance in planning their programs.

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: biochemistry, inorganic, organic, or physical chemistry.

The general University requirements for the M.S. degree are given on pages 148-149. The Department of Chemistry makes use of the Thesis Plan. The General University requirements for the Ph.D. degree are given on page 151. 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 M2, 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 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, Mr. McTague (F)

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 (F,W,Sp)

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. Libby, Mr. McTague (W)

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 (F,W,Sp)

1CH. 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. (Sp)

1N. General Chemistry for the Pre nursing 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. (W)

M2. Introductory Chemistry.

(Same as Physical Sciences M2.) 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. Farrington, Mr. Hardwick (F,Sp)

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. Anet, Mr. Cram, Mr. Jacobs (F,W,Sp)

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. Cram, Mr. Jacobs, Mr. L. Scott (F,W,Sp)

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 transformation.

Mr. Atkinson, Mr. Smith, Mr. West (F,W,Sp)

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. (F)

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. Rebek (F,W,Sp)

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. Nuclear magnetic resonance spectroscopy; mass spectrometry; non-aqueous acid-base chemistry; polyprotic acid equilibria; chelates, electrochemistry.

Mr. Hardwick, Mr. L. Scott, Mr. Wasson (F,W,Sp)

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. Atkinson, Mr. Jordan, Mr. Konrad (F,W,Sp)

Upper Division Courses

Most upper division courses in the Department of Chemistry nominally involve four hours of lecture each week. However, one of the hours may be used for discussion, quiz, individual conference or individual study.

103. Environmental Chemistry.

Lecture four hours. Prerequisite: courses 4A, 4B and consent of the instructor. Chemical aspects of air and water pollution, solid waste disposal, energy resources, and pesticide effects. Chemical reactions in the environment, and the effect of chemical processes on the environment.

Mr. Bayes, Mr. Foote, Mr. Reiss (W)

110A. Physical Chemistry: Chemical Thermodynamics.

Lecture and quiz, four hours. Prerequisite: courses 1C, Physics 6B or 7B, Mathematics 13A or 12A-12B, 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. A section emphasizing applications to the life sciences is offered one quarter each year.

The Staff in Physical Chemistry (F,W,Sp)

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 (F,W,Sp)

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. A section emphasizing applications to the life sciences is offered one quarter each year.

The Staff in Physical Chemistry (F,W,Sp)

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 (F,W,Sp)

113. Physical Chemistry: Introduction to Quantum Chemistry.

Lecture and quiz, four hours. Prerequisite: course 1C, Physics 6C or 7D, Mathematics 13A or 12A-12B. An introduction to the principles and applications of quantum chemistry; atomic structure and spectra; harmonic oscillator; rigid rotor, molecular spectra.

Mr. Bayes, Mr. Reiss, Mr. R. Scott (F,W,Sp)

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. Bayes, Mr. Reiss, Mr. R. Scott (F,W,Sp)

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 (F,W,Sp)

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. Kivelson, Mr. Reiss (115A—W; 115B—Sp)

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. Bayes, Mr. Kasper, Mr. Reiss (W)

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. Knobler, Mr. R. Scott (F,Sp)

123B. Classical and Statistical Thermodynamics.

Lecture and quiz, four hours. Prerequisite: course 123A. Thermodynamics of phase equilibria; the solid and fluid states; non-electrolyte and electrolyte solutions; surface phenomena; high polymers; gravitation.

Mr. Baur, Mr. Knobler, Mr. R. Scott (W)

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, Mr. Levine (F)

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, 133AG, 136, and 144, although it may be taken concurrently with courses 133A and 133AG. Interpretation of infrared, ultraviolet, nuclear magnetic resonance and mass spectra in organic chemistry; introduction to other spectroscopic methods.

Mr. Evans, Mr. L. Scott (F)

133A. Intermediate Organic Chemistry.

Lecture and quiz, three hours; laboratory, four hours. Prerequisite: course 6B or course 131 (which may be taken concurrently) or equivalent instruction in spectroscopic methods of organic chemistry. Lecture: organic reactions; synthesis; classes of compounds. Laboratory: methods of organic reactions and synthesis; techniques of product isolation.

Mr. Geissman, Mr. Rebek (F,W)

133AG. 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. Geissman, Mr. Rebek (W,Sp)

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. Geissman, Mr. Rebek (W,Sp)

133BG. 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. Geissman, Mr. Rebek (W,Sp)

134. Organic Chemistry of Natural Products and Medicinals.

Lecture, three hours; laboratory, four hours. Prerequisite: courses 133A, 133B. The application of chemical principles in the study of compounds of natural occurrence and of physiological importance. Alkaloids; terpenoid compounds; steroids; metabolites of microorganisms and fungi; physiologically active compounds, natural and synthetic. The biosynthetic interrelationships of compounds produced by living organisms. The use of chemical and physical methods in structure determination. Laboratory work will include isolation of pure compounds from natural sources and their study by chemical and physical methods.

Mr. Geissman (Sp)

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. Foote (W)

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. Anet, Mr. Cram (F)

143B. Advanced Organic Chemistry.

Lecture and quiz, three hours. Prerequisite: course 143A. Organic reactions; organic synthesis; naturally occurring compounds.

Mr. Anet, Mr. Cram (W)

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 (F)

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 (F,Sp)

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. Jordan, Mr. Konrad (F,Sp)

173A. Structural Inorganic Chemistry.

Lecture, 3 hours. Prerequisite: courses 113, 110A (may be taken concurrently); 133B recommended. Introductory survey of structure and bonding in inorganic compounds; molecular stereochemistry; donor-acceptor interactions; coordination compounds of the transition metals; elements of crystal field and ligand field theory.

The Staff in Inorganic Chemistry (F)

173B. Advanced Inorganic Chemistry.

Lecture, three hours. Prerequisite: course 173A. Boron hydrides, carboranes and metallo-carboranes; inorganic polymers; organo-metallic chemistry of the transition elements; pathways of homogeneous catalysis; stereochemical non-rigidity; electronic and magnetic properties of transition metal complexes; metal-metal bonding and metal cluster complexes.

The Staff in Inorganic Chemistry (W)

174A. Inorganic and Metalorganic Laboratory Methods.

Lecture, two hours; laboratory, 8 hours. Prerequisite: courses 6A and 6B. Synthesis of inorganic compounds including air-sensitive materials; dry-box, vacuum line and high-pressure techniques; Schlenk methods; chromatographic and ion exchange separations.

Mr. Hawthorne, Mr. Kaesz (W)

174B. Physical Inorganic Chemistry.

Lecture, 3 hours. Prerequisite: course 113. Applications of spectroscopic techniques including IR, Raman, visible, UV, NMR, ESR and NQR to the elucidation of structure and bonding in inorganic and organometallic compounds; group theoretical methods; molecular orbital and ligand field theories.

Mr. Strouse, Mr. Zink (Sp)

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. Garner (Sp)

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. Strouse, Mr. Wasson (F,Sp)

196. Special Courses in Chemistry. (½ to 1 course)

To be arranged. Prerequisite: consent of the Chemistry Undergraduate Adviser.

The Staff (F,W,Sp)

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 (F,W,Sp)

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, Mr. McMillan (F)

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. El Sayed (W)

218. Physical Chemistry Student Seminar.

(½ course)

Seminars are presented by staff, outside speakers, postdoctoral fellows and graduate students. Each student doing research in physical chemistry is required to give a seminar on a timely and significant topic outside his immediate research specialty, ordinarily during the second year of graduate study. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Physical Chemistry (F,W,Sp)

221A-221F. Advanced Topics in Physical Chemistry. (½ course each)

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized specialty in physical chemistry, and will be taught by a staff member whose research interests embrace that specialty.

The Staff in Physical Chemistry (F)

***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.

Mr. McMillan (Sp)

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. Kasper (Sp)

228. 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 (F,W,Sp)

231A-231F. Advanced Topics in Organic Chemistry. (½ course each)

Prerequisite: consent of the instructor. Each course will encompass a recognized specialty in organic

* Not to be given, 1972-1973.

chemistry, and will be taught by a staff member whose research interests embrace that specialty.

The Staff in Organic Chemistry (F,Sp)

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. Anet, Mr. Rebek (W)

233B. Physical Organic Chemistry. (½ course)

Lecture, two hours. Prerequisite: course 233A. Approaches to organic reaction mechanisms; criteria of mechanism; nuclear magnetic resonance; stereochemistry.

Mr. Anet, Mr. Rebek (Sp)

238. Organic Chemistry Student Seminar.

(½ course)

Seminars are presented by staff, outside speakers, postdoctoral fellows and graduate students. Each student doing research in organic chemistry is required to give a seminar on a timely and significant topic outside his immediate research specialty, ordinarily during the second year of graduate study. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Organic Chemistry (F,W,Sp)

247. Mechanistic and Synthetic Chemistry 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.

Mr. Anet, Mr. Cram, Mr. Hawthorne (F,W,Sp)

248. Natural Products 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.

Mr. Evans, Mr. Rebek, Mr. L. Scott (F,W,Sp)

M251. Bioorganic Catalysis. (½ course)

(Same as Biological Chemistry M251.) Lecture, two hours. Prerequisite: courses 110A, 110B or equivalent; course 153 or Biological Chemistry 101B. Reaction mechanisms relevant to enzymic catalysis; approaches and techniques of peptide synthesis and chemical modification of proteins; stereochemistry of enzymic reactions.

The Staff in Biological Chemistry (W)

M253. Proteins and Nucleic Acids.

(Same as Biological Chemistry M253.) 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 (F)

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 (W)

M255. Biological Catalysis.

(Same as Biological Chemistry M255.) Lecture and

quiz, four hours. Prerequisite: courses 110A, 110B, 143A, and course 153 or Biological Chemistry 101B. Discussion of approaches to the understanding of enzymes and enzymic catalysis; characteristics of different enzymes and enzymic reactions of special biological processes.

Mr. Boyer (Sp)

M257. Physical Chemistry of Biological

Macromolecules. (½ course)

(Same as Biological Chemistry M257.) 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 (F)

258. Biochemistry Student Seminar. (½ course).

Seminars are presented by graduate students on topics of current biochemical interest. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Biochemistry (F,W,Sp)

261A-261F. Advanced Topics in Biochemistry.

(½ course each)

Lecture, two hours. Prerequisite: consent of the instructor. Each course will encompass a recognized specialty in biochemistry, and will be taught by a staff member whose research interests embrace that specialty.

The Staff in Biochemistry (F,W)

M263. Cellular Metabolism.

(Same as Biological Chemistry M263.) 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 (W)

M267. Nucleic Acid and Protein Biosynthesis.

(½ course)

(Same as Biological Chemistry M267.) 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 (Sp)

268. Biochemistry Research Seminar. (½ course)

Seminars are presented by staff, outside speakers, postdoctoral fellows and graduate students on topics of current biochemical research interest. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

The Staff in Biochemistry (F,W,Sp)

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 (F,W)

*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

* Not to be given, 1972-1973.

transformations; isotope effects; application of isotopes in chemistry. Mr. Libby (Sp)

278. Inorganic Chemistry Student Seminar.

(½ course)

Seminars are presented by staff, outside speakers, postdoctoral fellows and graduate students. Each student doing research in inorganic chemistry is required to give a seminar on a timely and significant topic outside his immediate research specialty, ordinarily during the second year of graduate study. Satisfactory/unsatisfactory grades are used for this course. May be repeated for credit.

(F,W,Sp)

*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.

*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. Mr. Wasson (W)

Individual Study and Research

598A-598ZZ. Directed Individual Study or Research. (½ to 4 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 (F,W,Sp)

Courses in Related Fields

597. Preparation for the Doctoral Qualifying Examination or the Master's Comprehensive Examination. (½ to 2 courses)

Prerequisite: consent of the Chemistry Grad-

uate 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 (F,W,Sp)

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 (F,W,Sp)

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. L. 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. S. Eisenberg, 599SE; M. A. El-Sayed, 599ME; D. A. Evans, 599DE; P. S. Farrington, 599FF; C. S. Foote, 599CF; C. S. Garner, 599CG; T. A. Geissman, 599TG; E. R. Hardwick, 599RH; M. F. Hawthorne, 599FH; A. U. Hazi, 599AH; T. L. Jacobs, 599TJ; J. M. Jordan, 599JJ; H. D. Kaesz, 599HK; J. V. V. Kasper, 599JK; D. Kivelson, 599DK; C. M. Knobler, 599CK; M. W. Konrad, 599MK; W. F. Libby, 599WL; W. G. McMillan, 599WM; J. P. McTague, 599PM; M. F. Nicol, 599NM; J. Rebek, 599JR; H. Reiss, 599HR; V. N. Schumaker, 599VS; L. T. Scott, 599LS; R. L. Scott, 599RS; R. A. Smith, 599AS; C. E. Strouse, 599CS; K. N. Trueblood, 599KT; J. T. Wasson, 599JW; C. A. West, 599CW; J. I. Zink, 599JZ. (F,W,Sp)

Many courses of interest to Chemistry and Biochemistry majors are listed under Physics, Biology, and Bacteriology. Outside the College of Letters and Science, the attention of students is directed to Engineering 238D, Atomic and Molecular Collisions, and Engineering 232D, Molecular Dynamics.

■ CLASSICS

(Department Office, 7349 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., *Emeritus Professor of Classics.*

J. Norman H. Austin, Ph.D., *Assistant Professor of Classics and Comparative Literature.*

John M. Gleason, Ph.D., *Assistant Professor of Classics.*

Steven Lattimore, Ph.D., *Assistant Professor of Classics and Classical Archaeology.*

Frank A. Lewis, Ph.D., *Assistant Professor of Classics.*

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, Retired.*

Barbara E. Killian, M.A., *Lecturer in Classics.*

Evelyn V. Mohr, M.A., *Lecturer in Classics.*

Major Fields in the Department

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: Greek 1, 2, 3 and Latin 1, 2, 3, or the equivalent.

THE MAJOR

Greek. Required: (1) nine upper division courses in Greek, including Greek 110; (2) one upper division course in Latin; (3) Classics 141 and either Classics 142 or 143. (4) two courses in Greek or Roman history (History 112A–112B, 113A–113B, 111B, 111C); (5) two additional courses in one or two of the related areas, classical archaeology (Classics 151A–151B–151C), classical mythology (Classics 161, 162), Greek and Roman religion (Classics 166A–166B), ancient philosophy (Philosophy 101, 102, Greek 121, 122, 123, 124), Byzantine civilization (Classics M70, M170A, M170B, History 123A–123B–123C), medieval Latin literature (Latin 131, 133), medieval history (History 121A–121B). Total required: 16 courses.

Latin. Required: (1) nine upper division courses in Latin, including Latin 110; (2) one upper division course in Greek; (3) Classics 143 and either Classics 141 or 142. (4) two courses in Greek or Roman history (History 112A–112B, 113A–113B, 111B–111C); (5) two additional courses in one or two of the related areas, classical archaeology (Classics 151A–151B–151C), classical mythology (Classics 161, 162), Greek and Roman religion (Classics 166A–166B), ancient phi-

losophy (Philosophy 101, 102, Greek 121, 122, 123, 124), Byzantine civilization (Classics M70, M170A, M170B, History 123A–123B–123C), medieval Latin literature (Latin 131, 133), medieval history (History 121A–121B). Total required: 16 courses.

Classics (Greek and Latin). Required: (1) fourteen upper division courses, seven in Greek and six in Latin, including Greek 110 and Latin 110; (2) two courses in the history of Graeco-Roman literature in English translation (Classics 141, 142, 143); (3) two courses in Greek or Roman history (History 112A–112B, 113A–113B, 111B, 111C). Total required: 18 courses. Additional courses in related areas are recommended (see under Requirement 5 of the Greek or Latin major).

Note: Students in any of the three majors are permitted to take Greek 200A–200B–200C and Latin 200A–200B–200C. Two of these courses may be counted as replacing one course in Requirement 3 of the Greek and Latin majors and Requirement 2 of the Classics major, as well as two courses in Requirement 1 of all three majors, thereby reducing the total number of required courses by one.

JOINT MAJOR FIELDS WITH OTHER DEPARTMENTS

English-Greek

Preparation for the Major

English 2, 10A, 10B, 10C; Greek 1, 2, 3.

The Major

(1) Seven courses selected from English 140–190 in consultation with an adviser in the Department of English; (2) Greek 100A, 100B, 100C; (3) four further upper division or graduate courses in Greek authors, chosen in consultation with an adviser in the Department of Classics. Total required: 14 courses.

English-Latin**Preparation for the Major**

English 2, 10A, 10B, 10C; Latin 1, 2, 3.

The Major

(1) Seven courses selected from English 140-190 in consultation with an adviser in the Department of English; (2) seven upper division or graduate courses in Latin, including 105A and 113, chosen in consultation with an adviser in the Department of Classics; of these six courses, at least two will be in poetry and two in prose. Total required: 14 courses.

Admission to Graduate Status

A candidate for admission to graduate status in the Department must meet, in addition to general University requirements, the minimum requirement of a Bachelor of Arts degree from this University, or its equivalent, with a major in the Classics (Greek and Latin) or in Greek or in Latin (for the M.A. in Greek or in Latin only). Candidates deficient in formal preparation may in exceptional cases be granted provisional admission.

Special Requirements for the Secondary Teaching Credential in Latin

Students preparing for this credential are required to take Latin 110 and Latin 370. Latin 370 may not be counted as part of the minimum course requirements for the M.A. degree.

Requirements for the Master's Degree in Classics

General University Requirements. See pages 148-149. The Department follows the comprehensive examination plan.

Foreign Language. During the first year study, the student must pass the standard reading examination set by the Graduate Division in French or German. Completion of French 5 or German 5 in this University with a minimum grade of C, or the equivalent, is acceptable in lieu of such examination.

Program of Study. Nine courses, including Greek 210 and Latin 210, at least one course from Greek 200A-200B-200C and one from Latin 200A-200B-200C, and one further 200-series course in each literature (chosen from 201-229). The remaining three courses are selected in consultation with the Graduate Adviser from the upper division and graduate offerings of the department, or exceptionally from other departments or programs in related fields such as archaeology, Indo-European studies, linguistics, ancient history, and ancient philosophy. In addition, the student

must complete the Reading Lists in Greek and Latin authors established for the M.A. degree in Classics.

Comprehensive Examinations. Three written two-hour examinations in (1) sight translation from Greek and Latin, (2) translation of passages from works on the Reading Lists, and (3) the history of Greek and Latin literature.

Requirements for The Master's Degree in Greek or in Latin

The General University and Foreign Language requirements are identical with those for the M.A. in Classics.

Program of Study. Seven upper division or graduate courses in Greek (Latin), including Greek (Latin) 210, at least two courses from Greek (Latin) 200A-200B-200C, and one further 200-series course in Greek (Latin) literature (chosen from 201-229). Two further upper division or graduate courses are chosen in consultation with the Graduate Adviser. Total: 9 courses.

Comprehensive Examinations. Three written two-hour examinations in (1) sight translation from Greek (Latin), (2) translation of Greek (Latin) passages from the Greek (Latin) part of the Reading Lists for the Master's degree in Classics, and (3) the history of Greek (Latin) literature.

Requirements for the Doctor's Degree

Admission to the Doctoral Program. Prerequisite for admission is an M.A. degree in Classics, with distinction, from this University, or its equivalent. In cases of doubtful equivalency the Department may allow provisional admission and require the candidate the pass with distinction during the first year of residence a set of tests identical with the M.A. comprehensive examination.

General Requirements. See page 151.

Foreign Language. French or German, in addition to and in the same manner as the language studied for the M.A. degree in Classics (see above).

Program of Study. At least one year of full-time graduate study (normally 8-9 courses) is required in preparation for the qualifying examinations. The student may elect to specialize in Classical Literature and Philology or in one of the following areas: Classical Linguistics, Ancient History, Ancient Philosophy, Classical Archaeology, Patristic or Byzantine Studies, Mediaeval Latin Studies. The choice of formal courses and seminars is determined in consultation with the Graduate Adviser and the individual Guidance Coun-

sellor so as to balance general competency and area specialization: e.g., if all of the M.A. courses were in Classical Literature and Philology, specialists in other areas may concentrate entirely on those areas; if courses in the area of specialization were included in the M.A. electives, further graduate courses in the literatures are indicated. In addition, all students must complete the Doctoral Reading Lists in Greek and Latin authors which are additional to the M.A. lists and differ somewhat depending on area specialization.

Qualifying Examinations for Advancement to Doctoral Candidacy and Conferral of the C.Phil. Degree. Three written three-hour examinations in translation and interpretation of (1) Greek and (2) Latin texts, partly from the Reading Lists and partly at sight, and (3) on the area of specialization. The oral examination, conducted by the Doctoral Committee, covers both the area of specialization and the general field of Classical studies.

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 10, 20, M70, 141, 142, 143, 151A, 151B, 151C, 161, 162, 166A, 166B, M170A, M170B, 251A, 251B, 251C, 251D, 252, 253, 254, 255, 260; Greek 40; Latin 40.

Classics

Lower Division Course

10. Survey of Classical Greek Culture.

Lectures, many illustrated, on Greek life and culture from the age of Homer to the Roman conquest. Discussion of art, literature, philosophy, and mythology. Readings in the Greek authors are suggested, but not required. A knowledge of Greek is not required. Mr. Lattimore

20. Survey of Roman Civilization.

A study of life and culture of Rome from the time of its foundation to the end of antiquity. A survey of art, literature, and political thought of the Romans. Selections from Latin authors are read in translation. A knowledge of Latin is not required. Mr. Maslowski

M70. Survey of Mediaeval Greek Culture.

(Formerly numbered 145A. Same as History M70.)

Classical roots and mediaeval manifestation of Byzantine civilization; political theory, Roman law, pagan critique of Christianity, literature, theology, and contribution to the Renaissance (including the discovery of America). Mr. Anastos

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.

A study of the major Greek and Latin dramas in translation. Mr. Austin, Mr. Gleason

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

151A. Classical Archaeology: Graeco-Roman Architecture.

A general introduction to the study of Aegean, Greek, and Roman architecture. Mr. Clement, Mr. Lattimore

151B. Classical Archaeology: Graeco-Roman Sculpture.

A general introduction to the study of Aegean, Greek, and Roman sculpture. Mr. Clement, Mr. Lattimore

151C. Classical Archaeology: Graeco-Roman Painting.

A general introduction to the study of Aegean, Greek, and Roman sculpture. Mr. Clement, 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. Puhvel

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. The Staff

166B. Roman Religion.

A study of the religion of the ancient Romans. The Staff

M170A. Byzantine Civilization.

(Formerly numbered 145B. Same as History M122A.) Emphasis is laid on Byzantine theology. Mr. Anastos

M170B. Byzantine Civilization.

(Formerly numbered 145C. Same as History M122B.) Literature, relations with Rome, and the Renaissance. Mr. Anastos

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.

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.

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

260. Seminar in Roman Religion.

Prerequisite: consent of the instructor. The Staff

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

287. Graduate Colloquium in Classical Literature.

Reading, research and discussion of selected topics from Greek and Roman Literature. May be repeated for credit.

The Staff

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, five hours per week.

Mr. Gleason, Mrs. Killian, Mrs. Mohr

2. Elementary Greek.

Lecture, five hours per week. Prerequisite: course

1. Mr. Gleason, Mrs. Killian, Mrs. Mohr

3. Elementary Greek.

Lecture, five hours per week. Prerequisite: course

2. Mrs. Killian, Mrs. Mohr, Mr. Packard

10. Elementary Modern Greek.

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. Not intended for native or near-native speakers of Modern Greek.

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

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 3 is prerequisite to 100A-100B-100C. One of 100A-100B-100C is normally prerequisite (or corequisite) to all further 100-series courses in Greek (specifics under separate entries below). 100A-100B-100C may be taken in any order.

100A. Readings in Early Greek Poetry.

Prerequisite: Greek 3. This course is prerequisite to 101A, 101B, 102, 107.

Mr. Gleason

100B. Readings in Attic Drama.

Prerequisite: Greek 3. This course is prerequisite to 103, 104, 105, 106.

Mr. Travis

100C. Readings in Attic Prose.

Prerequisite: Greek 3. This course is prerequisite or corequisite to 110 and prerequisite to 111, 112, 113, 121, 122, 123, 124.

Mr. Packard

101A. Homer: Odyssey.

Mrs. Mohr

101B. Homer: Iliad.

Mrs. Mohr, Mr. Travis

102. Lyric Poets.

Selections from Archilochus to Bacchylides.

Mr. Lewis

103. Aeschylus. Mr. Travis
104. Sophocles. Mr. Lattimore
105. Euripides. Mrs. Mohr, Mr. Travis
106. Aristophanes. Mr. Travis
107. Theocritus. Mr. Austin, Mr. Lattimore
110. The Study of Greek Prose.
Work in sight reading and grammatical analysis of Attic prose texts; writing of Attic prose. Mr. Lewis
111. Herodotus. Mr. Gleason
112. Thucydides. Mr. Hoffleit
113. Attic Orators. Mr. Lattimore
121. Plato. Mr. Lewis
122. Plato: Republic. Mr. Hoffleit
123. Aristotle: Poetics and Rhetoric. Mr. Lewis
124. Aristotle: Ethics. Mr. Hoffleit
150. Readings in Modern Greek.
Prerequisites: Greek 3 or Greek 12 or consent of the instructor. Study of Modern Greek literature and its development since the Middle Ages through analysis of texts in the original. Mr. Petrounias
151. Advanced Readings in Modern Greek.
Prerequisites: Greek 150 or consent of the instructor. 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.
- 200A–200B–200C. History of Greek Literature.
Prerequisite: consent of the instructor. Lectures on the history of Greek literature, supplemented on the part of the student by the independent reading of Greek texts in the original. Mr. Anastos, Mr. Lewis, Mr. Petrounias
- 201A–201B. Homer: The Iliad. Mr. Austin, Mr. Packard
- 202A–202B. Homer: The Odyssey and the Epic Cycle. Mr. Packard
203. Hesiod. Mr. Austin
204. Homeric Hymns. Mr. Packard
205. Seminar in Aeschylus. Mr. Petrounias
- 206A–206B. Sophocles. Mr. Hoffleit
- 207A–207B. Euripides. Mr. Travis
- 208A–208B. Aristophanes. Mr. Travis
209. Seminar in Hellenistic Poetry. Mr. Austin
210. Advanced Greek Prose Composition.
Prerequisite: course 110 or the equivalent. Mr. Gleason, Mr. Hoffleit
- 211A–211B. Herodotus. Mr. Gleason
- 212A–212B. Thucydides. Mr. Hoffleit
213. Seminar in Greek Historiography. Mr. Brown
214. Demosthenes. Mr. Gleason
221. Seminar in the Presocratic Philosophers. Mr. Lewis
- 222A–222B. Plato. Mr. Hoffleit, Mr. Lewis
- 223A–223B. Aristotle. Mr. Lewis
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. Petrounias
- 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. Anastos
233. Byzantine Poetry.
A study of the main representatives of both religious and secular poetry. Mr. Petrounias
- 240A–240B. History of the Greek Language.
Prerequisite: consent of the instructor. 240A covers the linguistic history of Classical Greek. In 240B Post-Classical, Mediaeval, and Modern Greek are discussed. Mr. Packard, Mr. Petrounias
241. Greek Epigraphy.
A survey of Greek historical inscriptions, chiefly Attic. Mr. Clement, Mr. Packard
- 242A–242B. Greek Dialects and Historical Grammar. (½ course each)
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, 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, five hours per week.

The Staff

2. Elementary Latin.

Lecture, five hours per week. Prerequisite: course 1.

The Staff

3. Elementary Latin.

Lecture, five hours per week. Prerequisite: course 2.

The Staff

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.

Mrs. 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 3 is prerequisite to Latin 104, 105A, 107, 111, 113. One of the latter is normally prerequisite to all other 100-series courses in Classical Latin authors.

101. Plautus.

Mr. Gleason, Mrs. Mohr

102. Terence.

Mr. Gleason, Mr. Löfstedt

103. Lucretius.

Mr. Austin, Mr. Hoffleit

104. Ovid.

Mrs. Killian, Mrs. Mohr

105A. Vergil: Selections from Aeneid I-VI.

Mrs. Mohr

105B. Vergil: Advanced Course.

Mrs. Mohr

106. Catullus.

Mr. Levine, Mr. Maslowski

107. Horace: Odes and Epodes.

Mr. Levine, Mr. Maslowski

108. Roman Elegy.

Selections from Catullus, Tibullus, and Propertius.

Mr. Levine

109. Roman Satire.

Selections from the *Epistles* of Horace, the *Satires* of Juvenal, and the *Epigrams* of Martial.

Mr. Gleason, Mr. Levine

110. The Study of Latin Prose.

Work in sight reading and grammatical analysis of classical prose texts; writing of classical prose.

Mr. Hoffleit

111. Livy.

Mr. Hoffleit, Mr. Packard

112. Tacitus.

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

118. Seneca.

A selection of Seneca's works will be read in Latin, supplemented by further readings in translation.

Mr. Gleason, Mr. Löfstedt

130. 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

131. Mediaeval Latin Prose.

Prerequisite: course 130 or consent of the instructor. Extensive reading of selected texts in prose; interest is centered on the idiosyncrasies of Mediaeval Latin.

Mr. Löfstedt

133. Mediaeval Latin Poetry.

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

150. Roman Drama: Study and Performance.

Prerequisite: consent of the instructor. Intensive critical study of a dramatical work in Latin, culminating in its performance in the original language and manner of presentation.

Mrs. Mohr

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 pre-seminar and is normally prerequisite to course B, a seminar.

200A-200B-200C. History of Latin Literature.

Prerequisite: consent of the instructor. Lectures on the history of Latin literature, supplemented on the part of the student by the independent reading of Latin texts in the original.

Mr. Gleason, Mr. Levine, Mr. Maslowski

201. Seminar in the Roman Epic: Ennius to Silius Italicus.

The fragments of Ennius and selected readings from the minor epic poets (Lucan, Valerius Flaccus, Statius, Silius Italicus).

Mr. Hoffleit

202. Seminar in Catullus.

A detailed consideration of the entire Catullan corpus. Mr. Levine

203A. Elegiac Poetry.

Mr. Levine

203B. Propertius.

Mr. Levine

204A. Vergil's Aeneid.

Mr. Austin, Mr. Travis

204B. The Aeneid.

Mr. Austin, Mr. Travis

205. Seminar in Vergil's Bucolics.

Mr. Austin

206. Horace.

Mr. Austin

207. 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

210. Advanced Latin Prose Composition.

Prerequisite: course 110 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

220A. Cicero's Rhetorical Works.

Mr. Travis

220B. Cicero's Orations.

Mr. Travis

221A. Cicero's Philosophical Works.

Mr. Levine

221B. Cicero: De Natura Deorum.

Mr. Levine

222. Seminar in Roman Stoicism.

Prerequisite: a reading knowledge of Greek and Latin. Mr. Maslowski

223. Lucretius.

Mr. Packard

224. Seminar in the Roman Novel.

Petronius' *Satyricon* and Apuleius' *Metamorphoses*: a study of the literary problems. Mr. Travis

231A-231B. Seminar in Mediaeval Latin.

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.

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 devel-

opment 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)

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. Puhvel

243. Seminar in Latin Palaeography.

Studies in the development of the book hand in Latin manuscripts earlier than the invention of printing. Mr. Levine

244. Seminar in Textual Criticism.

Studies in the preparation of a critical edition of a Latin author. Mr. Travis

Professional Courses 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

495. College Teaching of Latin. (½ course)

Prerequisite: current service as a teaching assistant and consent of the instructor. Methodology of instruction, in conjunction with classroom practice. Mrs. Killian

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

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.

121A. The Early Middle Ages.

121B. The Later Middle Ages.

123A-123B-123C. Byzantine History.

250A-250B. Seminar in Ancient History.

252A-252B-252C. Seminar in Byzantine History.

Indo-European Studies 132. European Archaeology: The Bronze Age.

140. Introduction to Indo-European Mythology.

M150. Introduction to Indo-European Linguistics.

210. Indo-European Linguistics: Advanced Course.

220A-220B. Hittite.

280A-280B. Seminar in Indo-European Linguistics.

Philosophy 101. Greek Philosophy: Plato and Predecessors.

102. Greek Philosophy: Aristotle and Later Greek Philosophy.

■ COMPARATIVE LITERATURE (INTERDEPARTMENTAL)

Arnold J. Band, Ph.D., *Professor of Hebrew and Comparative Literature (Chairman).*

Pier-Maria Pasinetti, Ph.D., *Professor of Italian and Comparative Literature.*

J. Norman Austin, Ph.D., *Assistant Professor of Classics and Comparative Literature.*

E. Bond Johnson, III, Ph.D., *Assistant Professor of German and Comparative Literature.*

Ross P. Shideler, Ph.D., *Assistant Professor of Scandinavian Languages and Comparative Literature.*



Robert Martin Adams, Ph.D., *Professor of English.*

Marc Bensimon, Ph.D., *Professor of French.*

Frederick L. Burwick, Ph.D., *Associate Professor of English.*

James Kerans, Ph.D., *Associate Professor of Theatre Arts.*

George S. Rousseau, Ph.D., *Associate Professor of English.*

Robert M. Maniquis, Ph.D., *Assistant Professor of English.*

The Graduate Interdepartmental Program in Comparative Literature attempts to fulfill two criteria: competence in two or more literatures, and the ability to perceive and discuss relationships between a single literature and other literatures in general. Ideally, the student's specific and general knowledge should give him the capacity to function as a specialist in his major literature as well as a guide to the relations of art, literature, and society.

The Program draws upon the facilities, services, and faculty of UCLA's language and literature programs. With the exception of a few courses given by the Program in Comparative Literature which are essentially courses in methodology, genre, motif and period, all courses taken by Comparative Literature students are to be taken directly in the relevant language and literature departments. Members of those departments participate in the advising and examining of all degree candidates.

Admission Requirements for the M.A.

1. For entrance into the program a B.A. in literature, ancient or modern, is a prerequisite. Students not having a literature major in their B.A. program will be required to demonstrate the equivalent knowledge and comprehension of one literature before being considered a graduate student in good standing.

2. Applicants will be expected to have a 3.25 C.P.A. in upper division literature courses.

Foreign Language Requirements

Literature proficiency in one foreign language is a prerequisite to the courses in comparative literature. Before completion of the M.A. degree a reading knowledge of a second foreign language is strongly recommended. French or German is usually recommended as one of the M.A. candidate's two foreign languages.

Course Requirements for the M.A.

The following twelve courses will be the minimal course requirement. Some students will take extra courses to make up deficiencies. Modifications may be made with the consent of the chairman.

1. Three courses in Comparative Literature. A. Comparative Literature 200—Methodology: theory of literature, bibliography, etc. B. The comparative study of one genre, e.g. the novel, the epic, the lyric. C. the comparative study of one period or movement, e.g. Baroque, Romanticism.

2. Six courses (a minimum of three must be graduate courses, the other three upper division) in the student's major literature. The departmental course in the history of the language of that particular literature may be included.

3. Three courses, either graduate or upper division, in the student's minor literature. The student should be directed to study periods, genres, or problems in his minor literature which lend themselves to comparison with similar elements in his major literature.

Qualifying Examination

The examination for the M.A. will be written and oral, testing both historical knowledge and comprehension of methodology. The results of this examination will determine the student's ability to continue towards the Ph.D. degree in Comparative Literature. There are three possible results of the examination. A student may be allowed to progress toward his Ph.D., or he may be granted a terminal M.A., or he may fail the examinations altogether.

The written examinations will test the student's skill in literary analysis and his detailed knowledge of specified works in the student's major and minor literatures. The examinations will be based upon reading lists from the works of approximately ten to fifteen authors in the major literature and the works of five authors in the minor literature.

The oral examination will be a general discussion of the student's major literature and his period of emphasis within the minor literature. This examination goes beyond the student's reading list and allows a greater degree of probing into the student's capacity to analyze, synthesize, and discuss relations between works of literature. The student will be allowed to proceed towards the Ph.D. in Comparative Literature only after he has passed this oral examination.

Ph.D. Requirements Admission

Basic requirements are the same as for the M.A. Normally the student will be expected to qualify for his M.A. before proceeding towards the Ph.D. A student coming with an M.A. in one literature shall be required to pass the qualifying examination for the M.A. in Comparative Literature.

Foreign Language Requirements

The candidate must have literature proficiency in at least two foreign languages before taking the qualifying examination. If the student intends to offer three literatures written in foreign languages for his Ph.D. degree, he will be expected to have literature proficiency in the three pertinent foreign languages. Normally, the student will be

tested in his first foreign language during his first year of residence and in his second foreign language during his second year of residence. The committee recommends a reading knowledge of a third language. A classical language is usually necessary for anyone majoring in a period prior to the 19th century.

Course Requirements

The plan for the first year will be similar to that for the M.A. in Comparative Literature. There are no course requirements beyond the twelve outlined in the M.A. requirements, but a number of courses are usually necessary to give the student sufficient depth in his major and two minor literatures. All students will be required to pass the written and oral M.A. examinations before proceeding towards the Ph.D. The student's second year program will be determined in consultation with his advisory committee.

The Ph.D. Qualifying Examination

The candidate will be examined in his major literature and in two minor literatures. (Two of these three literatures must be from different language groups, i.e. Romance and Germanic, English and Slavic, etc.) The examinations may be taken as soon as the student has received permission to proceed and has satisfied all foreign language requirements. The candidate will normally be examined on:

1. One literature from its earliest texts to the end, with heavy emphasis on one period, and the remainder on the basis of a reading list.
2. Two additional literatures in only one relevant period each. A student may petition to be examined on only two literatures if both have been studied from the earliest texts to the end.
3. The methodology of Comparative Literature in relation to the period or periods of emphasis.

Written Examinations

Five written examinations are required for the Ph.D. Qualifying Examination. They may be taken together or spaced over five quarters. In the major literature—assuming it is a European literature—there will be three examinations covering the early, the middle, and the modern period of that literature. There will, in addition, be one examination in each of the two minor literatures within the student's period of specialization.

The Oral Examination

The oral examination emphasizes the student's ability to deal with the theory and problems of Comparative Literature as they specifically relate to his particular fields of interest.

Dissertation

When a candidate has passed his qualifying examinations he is officially advanced to candidacy and may proceed with the writing of his dissertation on a topic approved by his committee.

Final Examination

The final examination for the degree is a defense of the dissertation before a University committee.

Graduate Courses

200. The Methodology of Comparative Literature.

Prerequisite: consent of the instructor. A study of both the methodology of comparative literature and the theory of literature. Mr. 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. Mr. Austin

221. The Lyric: Classical to Modern.

Prerequisite: some knowledge of either Latin or Greek. An examination of the genres and conventions of Greek and Roman lyric poetry and their influence on subsequent European poetry. Mr. 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. Mr. Rousseau

251. Varieties of Picaresque Fiction in the 18th Century.

Prerequisite: some knowledge of eighteenth century English literature, and a reading knowledge of two of the following languages: French, Spanish, German, Italian. A study of the metamorphoses of picaresque fiction during 1700-1800, with special attention to the novels of Defoe, Fielding, Smollett, Diderot, Rousseau, and others. The course will begin with a study of Cervantes' *Don Quixote* and will map out a critical theory for quixotic versus picaresque fiction. Mr. Rousseau

252. Structural Problems in Autobiography.

Prerequisite: a reading knowledge of one European language, plus one other language. This course explores the ways in which writers of different nationalities and cultural backgrounds conceive of the form known as autobiography. Students are expected to read extensively in the autobiographical literature of two languages, one of which must be European. Mr. 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. Mr. 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. Mr. Burwick

271. Dramatic Theory and Criticism in German and English Romanticism.

Prerequisite: a reading knowledge of German. This seminar examines the generic conception of drama in the critical essays of the Schlegels, Tieck, Jean Paul, Coleridge, De Quincey, and Hazlitt. It gives particular attention to the role of the actor and the idea of dramatic action as discussed by the critics. Mr. 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. Mr. Maniquis

276. Theory of Bourgeois Drama in the Nineteenth Century.

(Formerly numbered 290.) Prerequisite: a reading knowledge of at least one appropriate foreign language. Seminar to examine the nature and determinates of this mode of drama by study of selected plays and critical texts. Mr. Kerans

280. The Symbolist Tradition 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. Mr. Shideler

281. Poetry and Poetics of the Post-Symbolist Period.

Prerequisite: a reading knowledge of either French or German. A study of some of the dominant poetic trends and figures in American and European poetry in the first half of the 20th century including such Surrealists as G. Apollinaire and A. Breton, imagists, and major individual poets such as E. Pound, T. S. Eliot, Paul Valéry, R. M. Rilke, Stefan George, and Wallace Stevens. Mr. Shideler

291. The Post-Joycean Novel.

Prerequisite: a reading knowledge of at least one appropriate foreign language. A study of the post-Joycean novel in several of its best-known representatives: Nabokov, Robbe-Grillet, Queneau (or Butor or Claude Mauriac), Gadda, Borges, and Beckett. Some knowledge of Joyce will be assumed. Mr. Adams

596. Directed Individual Study. (½ to 2 courses)

The Staff

596X. Directed Individual Study. (½ to 1 course)Preparation for Foreign Language Examination.
The Staff**597. Preparation for the Doctoral Qualifying Examination. (½ to 2 courses)**

The Staff

599. Research on Dissertation. (½ to 2 courses)

Restricted to those who have passed the qualifying examination for the doctor's degree. The Staff

■ COMPREHENSIVE HEALTH PLANNING

The interdepartmental program leading to the M.S. in Comprehensive Health Planning is sponsored jointly by the Department of Political Science, the Graduate School of Management, the School of Public Health, the School of Medicine, and the School of Architecture and Urban Planning.

The program is designed to acquaint students with policy issues and operational problems in health systems, to develop skills in the use of quantitative and computer methodologies for planning, and to enhance understanding of the social and technological environments in which health systems are embedded. The curriculum is arranged so that the student builds conceptual and methodological bases in planning and the implemen-

tation of plans, acquires substantive knowledge about health delivery systems, and finally applies this knowledge and experience to comprehensive planning for health programs.

The program occupies two academic years (six quarters) plus a summer field placement. A limited number of stipends are available. Applicants are expected to offer preparation in mathematics through calculus and courses in microeconomics, statistics, and social sciences. Some course deficiencies may be removed after admission to the program.

For further information contact: Jerome W. Lubin, Director, Comprehensive Health Planning Program, School of Public Health, UCLA Center for the Health Sciences, Los Angeles, California 90024.

■ 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.

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.

Management

Master and Ph.D. degree programs with specialization in computers and information systems, computer simulation, and mathematical programming.

Mathematics

Please see Mathematics-Computer Science major, page 82.

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 depart-

ments, colleges or schools, extra-departmental courses and programs; and to monitor and evaluate such courses and programs. . . . A modest funding is provided the Council to be used for faculty released time, outside lecturers, and teaching and research assistant positions in order to implement new curricular experiments. The Council can sanction a specific course for a period of up to two years, though in practice, encouragement is given to departments for the absorption of

these innovations into their regular curriculum. Courses and/or programs sponsored by CED such as student-faculty courses constructed by the Committee for the Study of Education and Society (CSES) and courses offered independently by the Ethnic Studies Centers are listed in the Registration (and subsequent) issues of the *Daily Bruin*. Information on offerings may be obtained from the secretary to the CED, Academic Senate Office, Murphy Hall.

■ DANCE

(Department Office, 205 Women's Gym)

Pia Gilbert, *Professor of Dance*.

Alma M. Hawkins, Ed.D., *Professor of Dance (Chairman of the Department)*.

Carol Scothorn, M.A., *Associate Professor of Dance*.

Penelope Leavitt, M.A., *Assistant Professor of Dance*.

Malcolm McCormick, M.A., *Assistant Professor of Dance*.



Charles A. Berliner, M.F.A., *Lecturer in Dance*.

Elsie Dunin, M.A., *Lecturer in Dance*.

Hazel Hood, *Lecturer in Dance*.

Margalit Oved Marshall, *Lecturer in Dance*.

Barbara Mattingly, *Lecturer in Dance*.

Lew Nashan, M.A., *Lecturer in Dance*.

Emilio Pulido-Huizar, *Associate in Dance*.

William Ross, *Lecturer in Dance*.

Marion Scott, *Lecturer in Dance*.

Mia Slavenska, *Lecturer in Dance*.

Doris Siegel, *Lecturer in Dance*.

Allegra Snyder, M.A., *Lecturer in Dance*.

Marva Spelman, Ph.D., *Lecturer in Dance*.

Carol Warner, *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 92.

Preparation for the Major

Dance 30A-30B, 35, 36A-36B-36C, 37A-37B-37C, 38A-38B, and 70A; and two courses (including at least one course with an asterisk) chosen from Art 50, 51, 52, 53, 54, 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; Physical

Education 101A-101B, three courses (12 units) chosen from Art 110A-110B-110C, 112A-112B, 118A-118B, Dance 140A-140B-140C, English 103, M111A, 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 pages 150-151). 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.

30A-30B. 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 Dancers. (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. **Miss Warner**

38A-38B. Dance Notation. (½ course each)

Prerequisite: courses 35 and 36C. Study of Labanotation with experience in recording and interpreting dance scores with emphasis on reading skills. **Mrs. Scothorn**

52. Introduction to Dance Theater. (½ course)

Prerequisite: course 36A. Study of the interaction of the aesthetic components of dance theater. **Mrs. Siegel**

70A-70B. Introduction to Performance in Ethnic Dance. (½ course each)

Study of basic movement in ethnic dance forms. **Mrs. Dunlap**

71A-71P. Performance Courses in Ethnic Dance. (½ course each)

May not be repeated for credit. (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-112C. 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.

131A-131C. 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.

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). Mrs. Snyder

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.

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. Mrs. Nashan

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. Mrs. Nashan

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.

153A-153B-153C. Choreography and Repertory.

Prerequisite: course 150C. Independent work in solo and group choreography. Exploration of various styles and forms. Performance in repertory works. Miss Scott

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, Mrs. Snyder

159. Advanced Dance Notation.

Prerequisite: courses 37C and 38A-38B. Intermediate and advanced Labanotation. Reconstruction and score preparation in ballet, modern, and ethnic dance. 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.

171A-171P. Performance Courses in Ethnic Dance.

(½ course each)

Each course may be repeated, with the consent of the instructor, for a maximum of four units. Prerequisite: corresponding course in 71A-71P series (i.e., 71A is prerequisite to 171A, 71B is prerequisite to 171B, etc.). (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

190A-190B-190C. Advanced Dance Performance.

(½ course each)

Prerequisite: consent of the instructor. The study of performance of major choreography.

Mrs. Scothorn, Miss Scott

197A-197B. Preseminar: 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.

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 93.

200. Dance Notation. (½ course)

Prerequisite: course 159. Advanced study of dance notation.

Mrs. Scothorn

202. Research Methods and Bibliography in Dance.
204A-204B-204C. Advanced Choreography.

(½, 1, ½ course)

Prerequisite: course 159C 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.

220. Dance in the 20th Century.

Prerequisite: courses 151A-151B. Concepts, styles and forms of dance in the 20th century.

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.

226. Dance Expressions in Selected Cultures.

Prerequisite: consent of instructor. Dance as a social and cultural experience in the life of man.

Mrs. Snyder

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

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)

596B. 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.*

Robert W. Clower, 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.*

J. Clayburn LaForce, Jr., Ph.D., *Professor of Economics (Chairman of the Department).*

Axel Leijonhufvud, Ph.D., *Professor of Economics.*

John J. McCall, Ph.D., *Professor of Economics (Vice Chairman of the Department).*

- Harold M. Somers, Ph.D., LL.B., *Professor of Economics*.
 Alice John Vandermeulen, Ph.D., *Professor-in-Residence of Economics*.
 Paul A. Dodd, Ph.D., LL.D., *Emeritus Professor of Economics*.
 Jacob Marschak, Ph.D., *Emeritus Professor of Economics and Management*.
 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*.
 Bruce Herrick, Ph.D., *Associate Professor of Economics (Vice Chairman of the Department)*.
 Michael D. Intriligator, Ph.D., *Associate Professor of Economics*.
 George G. S. Murphy, Ph.D., *Associate Professor of Economics*.
 Sam Peltzman, Ph.D., *Associate Professor of Economics*.
 Thomas Sowell, Ph.D., *Associate Professor of Economics*.
 Earl A. Thompson, Ph.D., *Associate Professor of Economics*.
 Charles W. Baird, Ph.D., *Assistant Professor of Economics*.
 Ronald Britto, Ph.D., *Assistant Professor of Economics*.
 Bryan C. Ellickson, Ph.D., *Assistant Professor of Economics*.
 William E. Gibson, Ph.D., *Assistant Professor of Economics*.
 Benjamin Klein, Ph.D., *Assistant Professor of Economics*.
 Cotton M. Lindsay, Ph.D., *Assistant Professor of Economics*.
 Robert T. Michael, Ph.D., *Assistant Professor of Economics*.
 Joseph M. Ostroy, Ph.D., *Assistant Professor of Economics*.
 Douglas D. Shetler, Ph.D., *Assistant Professor of 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 management. Economics majors wishing also to obtain a business teacher's credential should see "Business Education" page 214. 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 Management 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 Management: 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

The Department of Economics, while continuing to award the M.A. degree, has deemphasized it within its overall graduate program. Normally, prospective graduate students who have the degree objective of a terminal M.A. are not admitted to the program.

Candidates for the degree of Master of Arts in economics normally have completed the equivalent of an undergraduate major in economics. In addition to the general University requirements (see pages 148-149), the departmental requirements are nine upper division and graduate level courses in economics. 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. Beginning with Fall Quarter 1971, the M.A. will no longer be offered on the thesis plan, nor will separate M.A. comprehensive 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, for the comprehensive examination requirement.

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 management, 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 consisting of two courses in calculus and one in statistics. Economics 145 or 146 may be used as one of the "calculus" courses, and Economics 140 as the statistics course. Work previously taken by the student will be counted in fulfillment of this requirement.

Requirements for the Ph.D. Degree

Basic Requirements. See general University regulations, pages 151-153.

General Qualifying Examinations. 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. 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.

An 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.

Mathematics, Statistics, Economic History, History of Theory, and Accounting. Students are required to complete three courses in mathematics and statistics, consisting of two courses in calculus and one in statistics. Economics 145 or 146 may be used as one of the "calculus" courses, and Economics 140 as the statistics course. Work previously taken by the student will be counted in fulfillment of this requirement.

In addition, for students entering in the Fall Quarter 1971 and thereafter, at least one graduate course in econometrics, either Economics 246 or 247, will be required.

Doctoral candidates are required to have taken at least one quarter course in (a) American economic history, (b) European economic history, and (c) history of economic theory. Provisions also exist for fulfilling these requirements by special examination.

Finally, the Ph.D. program presupposes a knowledge of elementary accounting principles.

Language. The student will either pass an examination in one foreign language or will offer a coordinated set of three mathematics courses, in addition to those mentioned in the previous section. The three courses will be beyond the level of elementary calculus, i.e., courses numbered above Mathematics 11 in UCLA's Mathematics Department.

Fields for Graduate Degrees

Economic Theory (courses 201A-201B-

201C, 202A-202B, M203A-203B-203C, 204, 207; Economic Development (211, 212, 213); Regional Economics (221, 222); Public Finance (231, 232, 234); Mathematical Economics (245A-245B-245C); Statistics and Econometrics (246, 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.

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.

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

3. Lower Division Research Seminar in Micro Economics.

Prerequisite: Economics 1. Class enrollment limited to ten students. Seminar in which students do intensive research project under guidance of regular faculty. Student selects topic in consultation with instructor; subjects limited to materials covered in Economics 1. Student writes paper and presents to seminar. The Staff

4. Lower Division Research Seminar in Macro Economics.

Prerequisite: Economics 2. Class enrollment limited to ten students. Seminar in which students do intensive research project under guidance of regular faculty. Student selects topic in consultation with instructor; subjects limited to material covered in Economics 2. Student writes paper and presents to seminar. The Staff

10. Evolution of Economic Institutions in America.

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.

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. Micro Economic Theory.

The laws of demand, supply, returns, and costs; price and output determination in different market situations. Mr. Hirschleifer, Mr. Ostroy, Mr. Thompson

101B. Micro Economic Theory.

Theory of factor pricing and income distribution; general equilibrium; implications of the pricing process for the optimum allocation of resources; interest and capital.

Mr. Hirschleifer, Mr. Ostroy, Mr. Thompson

102. Macro Economic Theory.

Theory of income and employment. Introduction to fiscal and monetary policy.

Mr. Britto, Mr. Leijonhufvud

105. Introduction to Macrodynamics.

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.

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.

Theories of population growth and historical evidence. Secular, cyclical and cross sectional analysis of fertility. Economic analysis of migration and labor force participation. Population, human capital and economic growth.

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

111. Theories of Economic Growth and Development.

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

112. Policies for Economic Development.

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

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.

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.

Prerequisite: course 120 or 102. Income determination, impact analysis, growth decision, and regional information systems.

Mr. Ellickson, Mr. Hirsch

130. Public Finance.

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.

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.

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 Management 115A.

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. 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

145. Introduction to Mathematical Economics.

Prerequisite: a course in calculus. A review of calculus and differential equations, with applications to economics, specifically the theory of the house-

hold and the firm, capital theory, macro-economic systems, and cycles and growth.

Mr. Ellickson, Mr. Intriligator

146. Linear Models in Economics.

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

147. Introduction to Econometrics.

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

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. 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. Herrick, Mr. Michael

152. Economics of Trade Unions.

Prerequisite: course 150. Economic analysis of strikes, boycotts, lockouts, 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. Herrick, Mr. Michael

160. Money and Banking.

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.

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. Gibson

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. 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. Feltzman

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.

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.

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.

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.

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.

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.

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.

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

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.

192. International Finance.

Prerequisite: course 102. Emphasis on the 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, ex-

change controls, and international monetary organization. Mr. Allen

198. 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.

Mr. Gibson, Mr. Leijonhufvud, Mr. Thompson

M203A. Economics of Decision.

(Same as Management M203A.) Prerequisite: Economics 101B, 102, 140 and calculus. Mr. Marschak

M203B. Economics of Information.

(Same as Management M203B.) Prerequisite: Economics 101B, 102, 140 and calculus. Mr. Marschak

M203C. Economics of Organization.

(Same as Management M203C.) Prerequisite: Economics M203A-B. Mr. Marschak

204. Applications of Economic Theory. The Staff**207. History of Economic Theory.**

Mr. Allen, Mr. Baird, Mr. Sowell

211. Economic Growth: Measurement and Theory.

Mr. Britto

212. Economic Development of Underdeveloped Areas: Theory and Policy.

Mr. Herrick

213. Selected Problems of Underdeveloped Areas.

Mr. Herrick and the Staff

221. Urban and Regional Economic Analysis I.

Mr. Ellickson, Mr. Hirsch

222. Urban and Regional Economic Analysis II.

Mr. Ellickson, Mr. Hirsch

231. Public Finance.

Mr. Chen, Mr. Somers

232. Economics of Government Expenditures.

Mr. Chen

234. Economics of Federalism.

Mr. Thompson

245A-245B-245C. Mathematical Economics.

Mr. Infriligator

246. Use of Statistical Inference in Economics.

(Required of all Ph.D. students who do not take econometrics sequence 247-9.) A course designed to give the students sufficient acquaintance with the methods of applied econometrics to enable them critically to evaluate the modern empirical literature in their fields of specialization. Mr. Clowes

247. *Econometrics I.* Mr. Intriligator, Mr. McCall
248. *Econometrics II.* Mr. Intriligator, Mr. McCall
249. *Econometrics III.* Mr. Intriligator, Mr. McCall
251. *Labor Economics I.* Mr. Herrick, Mr. Michael
252. *Labor Economics II.* Mr. Herrick, Mr. Michael
253. *Labor Problems.* Mr. Herrick
261. *Monetary Economics I.*
Mr. Clower, Mr. Gibson, Mr. Thompson
262. *Monetary Economics II.*
Mr. Gibson, Mr. Thompson
271. *Industrial Organization, Price Policies, and Regulation: Theory.* Mr. Klein, Mr. Peltzman
272. *Industrial Organization, Price Policies, and Regulation: Policy.* Mr. Peltzman
275. *National Transport Policy.* Mr. Hilton
276. *Urban Transportation.* Mr. Hilton
281. *Evolution of Economic Institutions in Western Europe.* Mr. LaForce
282. *Soviet Economic Theory and Organization.* Mr. Murphy
283. *Evolution of Economic Institutions in the United States.* Mr. Murphy, Mr. Shetler
291. *International Trade Theory.* Mr. Allen
292. *International Finance.* Mr. Allen
293. *International Economics: Selected Topics.* Mr. Allen
- 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).*
- Lawrence W. Erickson, Ph.D., *Professor of Education.*
- 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).*
- Frank M. Hewett, 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.*
- C. Robert Pace, Ph.D., *Professor of Education.*
- Rosemary Park, Ph.D., *Professor of Education.*
- James Popham, 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*.
 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*.
 B. Lamar Johnson, 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*.
 Lynne C. Monroe, Ed.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*.
 Lawrence E. Vredevoe, Ph.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*.
 Arthur M. Cohen, Ph.D., *Associate Professor of Education*.
 Sol Cohen, Ph.D., *Associate Professor of Education*.
 Charlotte A. Crabtree, Ph.D., *Associate Professor of Education*.
 Norma J. Feshbach, Ph.D., *Associate Professor of Education*.
 Simon Gonzalez, Ed.D., *Associate Professor of Education*.
 Wendell P. Jones, Ph.D., *Associate Professor of Education*.
 Barbara K. Keogh, Ph.D., *Associate Professor of Education*.
 Frederick C. Kintzer, Ed.D., *Associate Professor of Education (Vice-Chairman of the Department)*.
 Jay D. Scribner, 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*.
 Richard C. Williams, Ph.D., *Associate Professor of Education*.
 Eva L. Baker, Ed.D., *Assistant Professor of Education*.
 Gordon L. Berry, 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*.
 James A. Farmer, Ed.D., *Assistant Professor of Education*.
 Gary D. Fenstermacher, Ph.D., *Assistant Professor of Education*.
 Charles C. Healy, Ph.D., *Assistant Professor of Education*.
 James W. Keesling, M.A., *Assistant Professor of Education*.
 Marilyn H. Kourilsky, Ph.D., *Assistant Professor of Education*.
 Thomas J. LaBelle, Ph.D., *Assistant Professor of Education*.
 Janice Laine, Ph.D., *Assistant Professor of Education*.

Donald Layton, M.Ed., *Assistant Professor of Education.*
 David O'Shea, M.A., *Assistant Professor of Education and Sociology.*
 Judith Ramirez, Ph.D., *Assistant Professor of Education.*
 Philip A. Reidford, Ph.D., *Assistant Professor of Education.*
 Thomas G. Robischon, Ph.D., *Assistant Professor of Education.*
 Val D. Rust, Ph.D., *Assistant Professor of Education.*
 Jack B. Share, Ph.D., *Assistant Professor of Education.*
 William L. Speizman, B.A., *Assistant Professor of Education.*



David Allen, Ed.D., *Lecturer in Education.*
 Freeman Ambrose, M.A., *Lecturer in Education.*
 Byron H. Atkinson, Ed.D., *Lecturer in Education.*
 Marjorie Day, Ph.D., *Lecturer in Education.*
 Steven Forness, Ed.D., *Lecturer in Education.*
 Shirley Hansen, Ed.D., *Lecturer in Education.*
 Madeline C. Hunter, Ed.D., *Lecturer in Education.*
 Robert Kindred, Ed.D., *Lecturer in Education.*
 Roy R. Lewis, M.S., *Acting Assistant Professor of Education and Physics.*
 Jerrold Novotney, Ed.D., *Lecturer and Specialist in Education.*
 Ronald Swartz, M.D., *Lecturer in Education.*
 Harriet Williams, M.A., *Lecturer in 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

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

M108. Sociology of Education.

(Same as Sociology M143.) 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

† All courses four class hours except where otherwise indicated.

social and personal development of children in relation to the school; educational measurement and the interpretation of research.

Mr. Keislar, Mr. Reidford

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.

Miss Laine

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

125A. The Education of Exceptional Children.

(Formerly numbered 116.) Prerequisites: Psychology 10 and 12, or 101; limited to graduate students and qualified seniors. The characteristics of and educational provisions for exceptional children, including the areas of mental retardation, emotional disturbance, learning disability, giftedness, and physical handicap.

Mr. Callaway, Mr. Hewett, Mrs. Seagoe

125B. Laboratory in the Education of Exceptional Children. (½ to 1 course)

Prerequisites: course 125A; limited to graduate students and qualified seniors. Four to eight hours per week of field work in a specific exceptionality; sections on the mentally and physically handicapped, educationally handicapped, and the gifted.

Mr. Callaway, Mr. Hewett, Mrs. Seagoe

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 870A and 870D.) 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 870B-870C.) 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

M201A-201D. History of Education.**M201A. History of Western Education.**

(Same course as History M215A.) 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

M201B. History of American Education to 1860.

(Same course as History M215B.) 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

M201C. History of American Education, 1860 to 1945.

(Same course as History M215C.) Emphasis on problems of urbanization, industrialization, immigration and public school reform. Contemporary school reform movements in context of social change.

Mr. S. Cohen

M201D. History of American Education, 1945 to the Present.

(Same as History M215D.) To be given in alternate years. Study of contemporary issues in American education in historical perspective, e.g., role of federal government, the corporate state, religion, technology and the media, rise of alternate school systems, the new educators, and minority groups.

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 crosscultural 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. An introduction to the study of education within the socio-cultural context of Spanish and Portuguese America.

Mr. LaBelle

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. Philosophy of Education: Introduction.

Systematic introduction to the entire field, indicating ways in which philosophy serves to elucidate educational aims, content, methods, and values.

Mr. Kneller

† Open only to students in graduate status. Consent of the instructor is required. All courses four class hours except where otherwise indicated.

208B. Philosophy of Education: Existentialism.

Examination of the meaning of the existentialist movement for educational thought and practice. Includes relevant aspects of phenomenology and humanism. Mr. Kneffler

208C. Philosophy of Education: Logic and Language.

Conceptual analysis of recurrent and contemporary themes in the field. Emphasis is on the development of logic and linguistic skills used in the analysis of educational problems and issues. Mr. Fenstermacher

208D. Philosophy of Education: Ethics and Values.

A study of ethics and values theory in teaching and learning, educational organization and policy, and curriculum design and validation. Mr. Robischon

208E. Philosophy of Education: Selected Classics.

Intensive examination of the works of one or a limited number of influential philosophies of education. Interested students are invited to submit requests for works to be studied. The Staff

208A-208B. Sociology of Education.**208A. The Organization of Education.**

Prerequisite: Some background in social science. Analysis of social and political features of educational institutions. Emphasis on change in education, the distribution of power in school systems and the nation, and educational organization.

Mr. Gordon, Mr. O'Shea, Mr. Speizman

208B. Sociological Paradigms in Education.

Prerequisite: course M108 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-209C. 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.

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

209C. Current Issues in Higher Education.

Identification, analysis, and discussion of major problems and issues in higher education—in administration, curriculum, student life, and institutional purposes—and of efforts to deal with these issues. Miss Park

210A-210D. Educational Research and Experimental Design.**210A. Basic Concepts in Educational Research.**

Fundamentals of research. The language of research. Basic statistical concepts. Planning of research. Interpretation of research outcomes. Introduction to descriptive statistics: mean, median, mode, variance. Introduction to normal curve. It is strongly recommended that all students have this background as a minimum.

Mr. Bradford, Mr. Skager

210B. Experimental Design in Educational Research.

(Formerly numbered 210A.) Prerequisite: knowledge of descriptive statistics. Inference. Randomization test or t-test. Normal curve tests. Analysis of variance. Randomized block and factorial designs. Internal and external threats to the validity of research conclusions.

Mr. Bradford, Mr. Keesling, Mr. Skager

210C. Experimental Design: Advanced Topics.

(Formerly numbered 210B.) Prerequisite: course 210B or equivalent work. Review of completely randomized block and factorial designs. Introduction to Latin square and fractional factorial designs. Random effects model ANOVA. Regression analysis. Analysis of covariance. Introduction to multiple regression. Quasi-experimental designs.

Mr. Keesling, Mr. Skager

210D. Experimental Design: Multivariate Analysis.

(Formerly numbered 210C.) Prerequisite: course 210C or equivalent work. Review of multiple regression analysis, analysis of covariance. Introduction to matrix algebra. Introduction to multivariate normal distribution. Multivariate analysis of variance. Linear discriminant function. Analysis of repeated measurements. Canonical correlation. Principal components.

Mr. Bradford, Mr. Keesling

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. 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

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

213C. Group Process in Education.

(Formerly numbered 259C.) 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

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.

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. 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 212B 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. Mrs. Feshbach

225. Issues in the Education of Exceptional Children.

Prerequisite: limited to students in graduate degree programs. Analysis of major research regarding contemporary trends, issues, and programs for the exceptional consideration of commonalities and differences among exceptional children. Mrs. Keogh

226A. Medical-Biological Aspects of Mental Retardation.

(Formerly numbered 228E.) Research on physical and psychiatric aspects of mental retardation as they affect learning in children; instructional modifications based on such factors. Mr. Share

226B. Psychosocial Aspects of Mental Retardation.

Prerequisites: course 225 or equivalent. Research on the psychological and sociological aspects of mental retardation as they affect learning in children; instructional modification based on such factors. The Staff

227A. Research on the Education of the Emotionally Disturbed.

Prerequisites: course 225 or equivalent. Research on the emotionally disturbed and their learning characteristics; instructional modifications based on such factors. Mr. Hewett

227B. Research on the Education of Children with Learning Disabilities.

Prerequisites: course 225 or equivalent; Psychology 132A-132B recommended. Research on learning disorders with special reference to minimal neurological impairment; instructional modifications based on such factors. Mrs. Keogh

228. Research on the Education of the Gifted.

(Formerly numbered 228D.) Prerequisites: course 225 or equivalent. Research on the gifted, the talented, and the creative; instructional modifications based on such factors. Mr. Callaway, Mrs. Seagoe

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. Theory and Research in Educational Administration.

Comprehensive study of the organizational problems of education.

Mr. Fawcett, Mr. Lucio, Mr. Williams

240B. Problems in Educational Government and Finance.

Intensive study of problems and issues affecting the governance and finance of schools.

Mr. Layton, Mr. Lindman, Mr. Scribner

240C. Administration of the Instructional Program.

Examination of current educational problems in the society and the strategies of their solution through curriculum policy and practice; instructional design and operation; and in-service training of teaching staffs.

Mr. Fielstra, Mr. Lucio, Mrs. Tyler

241. Research Methodology in School Administration.

Prerequisite: consent of instructor. Examination of research problems and strategies in school administration.

Mr. Williams

242A. Administration of Large Systems and Individual Schools.

Prerequisite: consent of instructor. Theoretical and functional problems in the administration of large systems and decentralized individual schools.

Mr. Lucio

242B. Legal Bases of Education.

Theory of laws relating to education; specific laws, court decisions, and legal procedures relating to schools, colleges, and universities.

Mr. Layton

242C. Personnel Systems in Schools.

The formulation and execution of personnel policies from both the organizational and individual basis.

Mr. Fawcett

242D. Educational Finance.

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. Lindman

242E. Administration of In-Service Education.

Emphasis on the development of knowledge, skills, and attitudes essential to exercising leadership in the facilitation of the professional growth of teachers, school administrators, and other educational personnel, especially as such growth contributes to instructional improvement and relevant curriculum development.

Mr. Fielstra

242F. Information Systems in Educational Planning.

Introductory survey in the use of quantitative analysis for problems in educational planning. Includes multivariate analysis, instructional systems engineering, systems approach to educational planning, design of management information systems in education, educational planning in underdeveloped countries, and computer programming fundamentals.

Mr. Bruno

242G. Communication Systems in Schools.

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

245A. Educational Policy Formation: The School in the Community Setting.

Prerequisite: consent of the instructor. Analyses of the school system as a political system and school-community relationships as they affect policies for urban school systems and inner city schools. The impact of community expectations, participation, control, and power for school district responsiveness.

Mr. Scribner

245B. Educational Policy Formation: The School in a Bureaucratic Setting.

Prerequisite: consent of instructor. Analyses of the structure and operation of urban school districts. Examination of school district dysfunction including the causes and effects of bureaucracy, the consequences of societal demands, the influences of the informal system, and the impact of teacher militancy.

Mr. Williams

245C. Educational Policy Formation: The School in a Federal System.

Prerequisite: consent of instructor. Analyses of intergovernmental relationships as they affect policies for urban school systems, with particular focus upon decisions influencing inner city schools. Major attention will be given to problems of coordinating governmental programs at the community and school district level.

Mr. Layton

246A. Mathematical Modeling of Educational Problems.

Prerequisite: course 242F and knowledge of computer programming or consent of instructor. Mathematical modeling of educational processes and problems. Emphasis upon problems amenable to quantitative types of analysis in educational administration and more theoretical projects concerned with educational planning.

Mr. Bruno

246B. Operations Research—Systems Analysis in Education.

Prerequisite: courses 242F and 246A; knowledge of computer programming or consent of instructor. Advanced topics in systems analysis, operations research and field work in educational institutions related to use of quantitative techniques in educational planning.

Mr. Bruno

246C. Strategic Planning in Education.

Problems of goal formulation; interorganizational competition; and control of environmental forces affecting resource utilization, with particular attention to the utility of open planning models in providing alternative resource allocation patterns.

Mr. Wilson

247. Seminar: Educational Policy and Planning, Special Studies.

Prerequisite: consent of instructor.

The Staff

249A-249C. Seminars: Evaluation in Higher Education.

249A. National Evaluation of Higher Education.

Mr. Pace

249B. Institutional Research and Evaluation.

Mr. Pace

249C. Special Evaluation Projects. Prerequisite: course 249A or 249B.

Mr. Pace

M250A. Seminar: History of Education.

(Same as History M287A.) Selected topics in History of Education: discussion, research, and writing.

Mr. S. Cohen

M250B. Seminar: History of Education.

(Same as History M287B.) To be given alternate years. Advanced seminar in bibliography and historiography in history of education.

251A-251E. Seminars: Philosophy of Education.

Prerequisite: appropriate 206 course or consent of the instructor.

251A. Problems of Knowledge. Mr. Kneller

251B. Problems in Behavioral Science.

Mr. Fenstermacher

251C. Problems in Analysis. Mr. Fenstermacher

251D. Problems in Ethics and Value.

Mr. Robischon

251E. Selected Issues.

The Staff

252A-252C. Seminars: Sociology of Education.

252A. Educational Organizations.

Mr. Gordon, Mr. O'Shea

252B. Education and Social Change.

Prerequisite: course 208A or consent of instructor.

Mr. Robischon, Mr. Weinberg

252C. Research Practicum. Mr. O'Shea

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.) Same as Latin American Studies M250C.) Prerequisite: course M240C.

M253D. Latin American Education.

(Same as Latin American Studies M250C.) Prerequisite: course 204D.

Mr. Speizman

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. Keeling, Mr. Skager

256. Seminar: Special Topics in School Learning and Development.

(Formerly numbered 255A-255B.) Prerequisite: consent of the instructor.

Mrs. Feshbach, 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

259A-259C. Seminars: Social Psychological Research in Higher Education.

259A. The College Student.

Mr. Trent

259B. The College Environment.

Mr. Trent

259C. Special Research Projects.

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.

(Formerly numbered 263 and 260A-260B.)

261D. The Junior College Curriculum.

(Formerly numbered 246A-246B.) Mr. Johnson

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.

Miss Laine

(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.)

262G. Business Education.

(Formerly numbered 267A-267B.) Mr. Wanous

262I. Vocational Education.

(Formerly numbered 268A-268B.) Mr. Barlow

262J. Economic Education.

Mrs. Kourilsky

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

268. Seminar: Instructional Analysis.

Prerequisite: course 420A. Critical examination of theories of instruction; problems in conceptualizing and researching related instructional, learner, and social system variables in classroom learning; problems in instructional decision-making and change.

Miss Crabtree, Mrs. Hunter

269A-269B-269C. Seminar: Inquiry into Childhood Schooling.

(Formerly numbered 254B.)

Mr. Goodlad

270A-270F. Seminars: Administrative Studies.**270A. Large Systems and Individual Schools.**

Prerequisite: consent of instructor. Mr. Lucio

270B. Educational Government.

Prerequisite: consent of instructor. Mr. Lindman

270C. Personnel Systems.

Prerequisite: consent of instructor.

Mr. Fawcett, Mr. Williams

270D. Educational Finance.

Prerequisite: consent of instructor. Mr. Lindman

270E. In-Service Education.

Prerequisite: consent of instructor. Mr. Fielstra

270F. Communication Systems.

Prerequisite: consent of instructor. Mr. Fawcett

280A. Seminar: Exceptional Children.

(Formerly numbered 263A.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mrs. Seagoe

280B. Seminar: The Mentally Retarded.

(Formerly numbered 229A.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mr. Kershner

280C. Seminar: The Educationally Handicapped.

(Formerly numbered 229B.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mr. Hewett, Mrs. Keogh

M280D. Seminar: Children with Learning Disorders.

(Formerly numbered 263B; same as Psychology M276A.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mr. Coleman

M280E. Seminar: Children with Learning Disorders.

(Formerly numbered 263C; same as Psychology M276B.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mr. Coleman

280F. Seminar: The Gifted.

(Formerly numbered 229C.) Prerequisites: Course 225, 226, 227, or 228 and admission to a doctoral program. Mr. Callaway, Mrs. Seagoe

Professional Courses**324A-324B-324C. Supervised Teaching:****Elementary.**

Mr. Fenstermacher 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: Elementary. (¼ to 1½ courses)

Prerequisites: courses 324A and 324B.

§ 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.

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. Fenstermacher and Staff

330A-330B-330C. Supervised Teaching:**Secondary.**

Mr. Fenstermacher and Staff

330A. Supervised Teaching: Secondary.**330B. Supervised Teaching: Secondary.**

Prerequisite: course 330A.

330C. Supervised Teaching: Supplementary.

(Formerly numbered 330E.) Prerequisite: courses 330A and 330B.

334. Supervised Teaching: Junior College.

Prerequisite: course 431 taken prior to or concurrent with 334. Mr. A. Cohen

370. Applications of Problem Solving Methods for Education Instruction.

Prerequisite: senior standing and consent of instructor. Course emphasizes methodologies in academic instruction, including research and active participation in the adversary approach for information exchange, forms of debate, role playing, interaction process analysis, utilization of feedback instruments. Mrs. Kourilsky

412A-412B-412C. Internship in School Counseling.

Prerequisites: consent of instructor; courses 412A-412B-412C must be completed in three consecutive quarters; limited to students enrolled in the Counseling Program. Two class hours, eight hours field experience. Working in public school or comparable setting, under University and school supervision, performing the duties of a school counselor—individual and group educational, personal, and vocational counseling, developing materials and establishing evaluative criteria.

413A-413B-413C. Internship in School Psychology.

Prerequisites: consent of instructor; courses 413A-413B-413C must be completed in three consecutive quarters; limited to students enrolled in the counseling Program. Two class hours, sixteen hours field experience. Working in public schools or comparable setting performing duties of a school psychologist—psychodiagnosis, integrating case material, staffing cases, developing educational plans, working with teachers and parents, and establishing evaluative criteria.

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

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.

418A-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 audio-visual 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.

Prerequisites: course 124A or 130 and consent of the instructor. Problems and issues in instruction are considered in class meetings and applied in a laboratory situation. 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. Miss Laine

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.

425A. Appraisal of Exceptional Children.

(Formerly numbered 416A.) Prerequisites: courses 225 and 415A or the equivalent. Individual appraisal of exceptional children with emphasis on the physically handicapped, mentally retarded, educationally handicapped, and gifted; analysis of tests and diagnostic procedures; case studies. Mr. Share

425B. Guidance of Exceptional Children.

(Formerly numbered 416B.) Prerequisite: course 225 or the equivalent. Educational, vocational, and personal guidance of the exceptional; parent counseling; career and training opportunities; community referrals. Mr. Share

426. Analysis of Programs for the Mentally Retarded.

(Formerly numbered 128B and 128C.) Prerequisite: course 225 or the equivalent. Evaluation of

instructional practice in relation to current research; formulation of model programs. Mr. Share

427A. Analysis of Programs for the Emotionally Disturbed.

(Formerly numbered 128D.) Prerequisite: course 225 or the equivalent. Evaluation of instructional practice in relation to current research; formulation of model programs. Mr. Hewett

427B. Analysis of Programs for Children with Learning Disabilities.

(Formerly numbered 128D.) Prerequisite: course 225 or the equivalent. Evaluation of instructional practice in relation to current research; formulation of model programs. Mrs. Keogh

428. Analysis of Programs for the Gifted.

(Formerly numbered 128E.) Prerequisite: course 225 or the equivalent. Evaluation of instructional practice in relation to current research; formulation of model programs. Mr. Callaway, 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. McNeill

429B. Design and practicum experience in the off-campus pre-student teaching preparation of student teachers. Mr. McNeill, Mr. Popham

431. College Curriculum and Instruction.

Principles of curriculum and instruction in junior college and university programs. Theory and practice in goal-setting, testing, media selection, and related instructional responsibilities. Preparing to teach college level 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

440. Practicum: Administrative Studies.

Prerequisite: consent of the instructor. The Staff

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

445. Internship in Special Education.

(Formerly numbered 428.) Prerequisites: limited to majors in Special Education; approval of instructor. Public school program and administrative participation for Ed.D., research participation for Ph.D. Two class hours, eight hours of field work. The Staff

446. Field Practicum: Educational Policy and Planning. (1 to 3 courses)

Three quarter sequence. A leadership development experience through participation in agencies which make decisions of consequence to urban school systems. Identification and analysis of selected problems and issues in urban schools, central staffs and community agencies. The Staff

447. Research Practicum: Educational Policy and Planning. (1 to 3 courses)

Three quarter sequence. Participation in studies

with agencies which assess, evaluate and make policy recommendations of consequence to urban school systems. Research strategies include qualitative and quantitative methods and techniques of social research, and problem solving approaches. The Staff

449. Internship in Junior College Administration.
(½ to 1 course)

May be repeated twice for credit.

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

469A-469B. Field Internship in American Schooling.

Prerequisite: courses 269A, 269B, 269C. Practice in advanced field leadership skills through participation in selected schools. Identification and analysis of

selected leadership issues and problems in American Schooling. The Staff

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)

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Michel Melkanoff, Ph.D., *Professor of Engineering and Applied Science (Chairman of the Department).*

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 D. Lewis Mingori, Ph.D., *Assistant Professor of Engineering and Applied Science.*
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 Lawrence G. Selna, Ph.D., *Assistant Professor of Engineering and Applied Science.*
 Frank W. Spaid, Ph.D., *Assistant Professor of Engineering and Applied Science.*



Roger A. Broucke, Docteur En Sciences Mathematiques, *Acting Associate Professor of Engineering and Applied Science.*
 George J. Tauxe, M.S., *Lecturer in Engineering and Applied Science.*

SYSTEM SCIENCE

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 Sheila A. Greibach, Ph.D., *Associate Professor of Engineering and Applied Science.*
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 Nhan Levan, Ph.D., *Assistant Professor of Engineering and Applied Science.*
 Jimmy K. Omura, Ph.D., *Assistant Professor of Engineering and Applied Science.*
 Izhak Rubin, Ph.D., *Assistant Professor of Engineering and Applied Science.*
 Kung Yao, Ph.D., *Assistant Professor of 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. Avizienis, Mr. Bussell (W)

10. Introduction to Computing.

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. Levine, Mr. Melkanoff (F,W,Sp)

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 (F)

20. Programming and Problem Solving.

Prerequisite: course 10 or equivalent. Solution of numerical and nonnumerical problems of intermediate complexity, using assembly languages and several programming languages. Students will analyze, program, and run half a dozen problems. Emphasis is placed on individual ability to carry out assignments under minimum supervision.

Mr. Melkanoff, Mr. Uzgalis (F,W,Sp)

Upper Division Courses

100. Circuit Analysis.

Prerequisite: courses 10, 101A, or equivalent; Physics 7B; course 100L should be taken concurrently; 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. Cotter (F,W,Sp)

100L. Circuit Analysis Laboratory. (½ course)

Prerequisite: courses 10, 101A, or equivalent; Physics 7B; course 100, which should be taken concurrently. Experiments with circuits containing linear and nonlinear devices; transient and steady state behavior of circuits. Mr. Cotter (F,W,Sp)

100B. Engineering Electromagnetics.

Prerequisite: course 100. Electromagnetic field concepts; Maxwell's Equations; static and quasi-static fields; field energy; energy flow and the Poynting vector; electromechanical interactions; waves in unbounded media and on two-wire transmission lines; reflection and refraction; lossy media; skin effect; analogs to electromagnetic fields.

Mr. Schott (F,W,Sp)

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. Analogous techniques for information processing.

Mr. Avizienis, Mr. Bussell (F,W,Sp)

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 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. Levan (F,W,Sp)

102. Mechanics of Particles and Rigid Bodies.

Prerequisite: course 101A (may be taken concurrently). Newtonian mechanics (statics and dynamics) of particles and rigid bodies. Fundamental concepts of mechanics. Statics, kinematics, and kinetics of particles and rigid bodies. Impulse-momentum and work-energy relationships. Applications.

Mr. Likins (F,W,Sp)

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. Cole, Mr. Meecham (F,W,Sp)

104C-104D. Experimental Engineering.

Laboratory, 8 hours. Prerequisite: senior standing in Engineering; consent of the instructor-in-charge for non-engineering students. Two-quarter comprehensive group projects in experimental engineering of a design or research nature involving laboratory work. Projects may be interdisciplinary but must be selected in advance. Students from various disciplines, such as Psychology, Public Health, Management, etc., may enroll.

Mr. Grandi, Mr. Shabailk, Mr. Stern (F,W,Sp)

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. Mr. Buchberg, Mr. Hicks, Mr. McCutchan (F,W,Sp)

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. Bannion, Mr. Edwards (F,W,Sp)

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. English (F,W,Sp)

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. Rosenstein (F,W,Sp)

107A. Principles of Biotechnology.

Prerequisite: third quarter sophomore or higher standing. 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 (F,W,Sp)

107B. Introduction to Science of Materials.

Prerequisite: Chemistry 1C, Physics 7D; (not open for credit for students having taken 16A or 107). This course is to be followed by 107C. Relationship between principles of physics and chemistry and properties of technological materials. Microscopic structures. Physical and mechanical properties of solids emphasizing behavior of electrons in crystals. Semiconductor materials and devices. Laboratory experiments on selected topics. Mr. Ardell (F,W,Sp)

107C. Intermediate Materials Science. (½ course)

Prerequisite: course 107B or equivalent. Microstructure-property relationships in engineering materials. Elastic and plastic properties, dislocations, strengthening mechanisms and fracture of structural materials. Plastic forming methods. Microstructural effects on electronic materials.

Mr. Ardell, (F,W,Sp)

108. Mechanics of Deformable Solids.

Prerequisite: course 102. Review of equilibrium principles. Concepts of stress and strain. Material constitution (stress-strain relations). Energy in deformable bodies. Structural applications to trusses, beams, shafts, columns and pressure vessels.

Mr. Dong, Mr. Mal (F,W,Sp)

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. Lin (F,W,Sp)

109. The Engineer and Society.

Prerequisite: senior standing. Selected lectures, discussions, oral and written reports related to creative engineering, its sociological and ecological impacts, present, future, and past relationships. Maximum student participation in topical selection and class structuring. Creativity and original thinking is emphasized.

Mr. Case, Mr. O'Neill (F,W,Sp)

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 (F,Sp)

110B. Passive Network Synthesis.

(Formerly numbered 110A.) Prerequisite: course 110A or equivalent. Properties of positive real functions and tests for positive realness. Synthesis of one and two-port RLC and two-element kind networks.

Mr. Bauer, Mr. Orchard (F,Sp)

111. Electrical Energy Systems Theory.

Prerequisite: courses 100, 100L, 101A; course 110A recommended. Fundamental concepts of electric energy systems. Operational considerations. The synchronous machine; systems model representation; the high energy transmission line. The energy system in steady state system modeling and load flow analysis; optimum operating strategies; the control problem.

Mr. Grandi (Sp)

M115A. Solid State Fundamentals.

(Same as course M140A.) 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 (F,W,Sp)

115B. Dielectric, Magnetic and Conductive Properties of Solids.

(Formerly numbered 140B.) Prerequisite: course M115A or M140A. 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. Stafsudd (W,Sp)

115C. Semiconductor Electronics.

Prerequisite: course M115A or M140A. Semiconductor theory, intrinsic and extrinsic semiconductors, transport of excess carriers, recombination processes. Semiconductor materials. Semiconductor technology.

Mr. Viswanathan (F,Sp)

115D. Principles of Semiconductor Device Design.

Prerequisite: senior standing in engineering; course 115C recommended. Review of excess carrier density in semiconductors; 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, (F,W)

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. Holm-Kennedy, Mr. Viswanathan (F,W,)

115F. Semiconductor Devices Laboratory.

(½ course)

Prerequisite: course 115D. Design, fabrication and characterization of junction, field effect and other semiconductor devices. In particular, the student will

perform various processing tasks such as wafer preparation, oxidation, impurity diffusion, metallization, sintering and photolithography.

Mr. Holm-Kennedy, Mr. Viswanathan (W,Sp)

116A. Electronics I.

Prerequisite: course 110A (may be taken concurrently). 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 (F,W,Sp)

116B. Electronics 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 (F,W)

116C. Pulse and Digital Methods.

Prerequisite: courses 116A, 116B. Analysis and design of switching-mode electronic circuits and systems including pulse generation, logic operations, timing and frequency counting.

Mr. Cotter (W,Sp)

118D. Electronic Signal Processing.

Prerequisite: courses 116B, 121C. Signals and spectra. Signal distortion in transmission filters, transmission bandwidth requirements. Random signals and noise, linear modulation, exponential modulation circuits and characteristics. Commercial communication systems.

Mr. Bauer, Mr. Willis (Sp)

116L. Electronics I Laboratory. (½ course)

Prerequisite: to be taken concurrently with course 116A. Experimental determination of device characteristics, resistive diode circuits, single-state amplifiers, compound transistor stages, effect of feedback on single-stage amplifiers.

Mr. Bauer (F,W)

116M. Electronics II Laboratory. (½ course)

Prerequisite: to be taken concurrently with course 116B. Experimental and computer studies of multi-stage, wideband, tuned, and power amplifier, and multiloop feedback amplifier.

Mr. Bauer (F,W)

116N. Pulse and Digital Methods Laboratory.

(½ course)

Prerequisite: to be taken concurrently with course 116C. Experimental and computer studies of diode and transistor switching and timing circuits. Linear and nonlinear wave shaping techniques. Waveform generation.

Mr. Cotter (Sp)

117A. Electromagnetic Waves I.

Prerequisite: course 100B. Review of transmission line theory; guided waves in enclosed waveguide and on surfaces; Smith Chart; excitation of guided waves; phase and group velocity; cavity resonators; concept of Q; perturbation theory; waves in complex media (ferrites, crystals, semiconductors, plasmas).

Mr. Schott (F,Sp)

117B. Electromagnetic Waves II.

Prerequisite: course 117A. Retarded potentials; dipole radiation; radiation from wire antennas; near-field and far-field phenomena; aperture antennas; spherical antennas; simple arrays scattering from spheres and cylinders; radar cross-sections.

Mr. Pogorelski (W)

117C. Electromagnetic Waves III.

Prerequisite: course 117A. Special relativity; relativistic kinematics; field transformations; particle trajectories in electromagnetic fields; radiation from accelerated charges; waves in active media, microwave sources.

Mr. Fogorelski (Sp)

117L. Electromagnetics Laboratory. (½ course)

Prerequisite: course 117A; course 117B may be taken concurrently. Experimental investigation of microwave and millimeter wave sources; coaxial waveguide strip line transmission systems; detectors and power measuring devices; cavity resonator studies; antenna impedance and radiation characteristics.

Mr. Schott (W)

M118. Plasma Physics.

(Same as Physics M122.) Prerequisite: course 100B for Engineering students only; or Physics 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.

Mr. Chen (F,Sp)

120A-120B. Random Signals.

Prerequisite: Mathematics 12C. 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. Carlyle, Mr. Omura (120A—F,W; 120B—W,Sp)

120C. Introduction to Queues and Point Processes.

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. Rubin (F,Sp)

121C. Signals and Systems.

Prerequisite: Mathematics 12C. 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 (F,Sp)

122A. Principles of Feedback Control.

Prerequisite: courses 101A and 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. Mortensen, Mr. Wiberg (W)

122B. Optimal Control I.

Prerequisite: course 128A or equivalent. Thorough treatment of the linear optimal control problem with quadratic cost.

Mr. Mortensen, Mr. Wang (F,Sp)

123A. Basic Structures for Data Representation.

Prerequisite: course 20. 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. Krieger, Mr. Muntz (F,W,Sp)

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 (F,W,Sp)

124A. Computer Applications: Lumped Parameter Systems.

Prerequisite: senior standing in engineering and course 100D. A comprehensive survey of the application 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 (F,W,Sp)

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, Mr. Levine

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 (F,W,Sp)

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. Russell, Mr. Chu, Mr. Nilson (F,Sp)

125L. Programming Languages and Systems.

Prerequisite: courses 10, 20. The main objective is to study, compare and evaluate programming languages, in particular commercially available languages: FORTRAN, ALGOL, COBOL, PL/I. On-line languages (e.g., BASIC) and some special purpose languages are also examined. Basic principles of programming systems are introduced.

Mr. Karplus, Mr. Melkanoff, Mr. Ungalis (F,W,Sp)

125N. Compiler Construction.

Prerequisite: courses 100D, 125L or consent of the instructor. Modern compiler structure. Syntax analysis. Lexical analysis. Semantic analysis and run-time environment. Program and data structure. Code optimization.

Mr. Martin (W, Sp)

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

126C. Systems Programming.

Prerequisite: courses 100D, 123A, 125L. Introduction to modern operating systems. Mapping and binding of addresses. The organization of multi-programming and multiprocessing systems; interrupts, process model, and interlocks. Resource allocation models and the problem of deadlocks. Job control and system management.

Mr. Muntz (F,Sp)

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. Viterbi, Mr. Yao (F,Sp)

126A. Linear Systems.

Prerequisite: 101A 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. Levan, Mr. Wilberg, (F,W)

128D. Discrete Systems and Automata.

Prerequisite: consent of the instructor. 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. Cariyle, Miss Greibach (F,W)

128L. System Science Laboratory.

Laboratory, six hours. Prerequisite: course 121C 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. Wilberg (Sp)

129A. Introduction to Optimization Techniques.

Prerequisite: Mathematics 12A and 12B 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, Mr. Wang (F,Sp)

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 (F,Sp)

131A. Convective Heat Transfer.

Prerequisite: course 105D. Heat transfer by free and forced convection in a moving fluid. Applica-

tion of dimensionless analysis to convective heat transfer within ducts and over the exterior surfaces of solid bodies. Boundary layer equations, similarity solutions, and turbulent transfer coefficients.

Mr. Denny, Mr. Mills (F)

131B. Heat Transfer.

Prerequisite: course 105D. Analytical and numerical techniques for solving problems involving heat transfer; radiation heat transfer; steady conduction in solids having convection and radiation at their boundaries; transient conduction; thermal system analysis.

Mr. Edwards (F)

131C. Environmental Transfer Processes.

Prerequisite: course 105D and either 131A or the consent of the instructor. Dispersion of waste heat ("thermal pollution control") by bodies of water and cooling towers. Atmospheric transfer processes and methods of estimation of both gaseous and particulate concentrations due to emissions from power plant stacks, cooling towers, or other localized sources.

Mr. Catton (W)

132A. Mass Transfer.

Prerequisite: course 105D or 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 (W)

133A. Propulsion.

Prerequisite: courses 108A, 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 (W)

134. Chemical, Nuclear and Thermal Pollution of the Environment.

Prerequisite: upper division standing. Description of the environment and the nature of environmental problems. Emphasis on the atmosphere and water as receptors of man-made and natural pollution; a description of sources of pollution, alternatives for control, and transport in the environment.

Mr. Catton, Mr. Kastenber, Mr. Perrine (F)

135A. Nuclear Reactor Theory.

Lecture, 2 hours; laboratory, 4 hours. Prerequisite: course 101A 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. Hicks (F)

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 (W)

135C. Nuclear Reactor Processes and Laboratory.

Lecture, 2 hours; laboratory, 4 hours. Prerequisite: course 135B. Continuation of 135B. Fuel and product materials, fuel management, isotope separation, energy removal, calculational techniques by numerical and experimental methods. Mr. Okrent (Sp)

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, Mr. Nobe (F)

137B. Separation Operations—Environmental Control.

Prerequisite: course 105D and either 137A or consent of the instructor. Fundamentals of separation processes with emphasis on environmental control applications. Topics include filtration, precipitation, gas absorption, distillation and reverse osmosis.

Mr. C. Chu, Mr. Landolt, Mr. McCutchan (W)

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, Mr. Nobe (W)

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. C. Chu, Mr. McCutchan (Sp)

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 (W)

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. Bennion, Mr. Landolt, Mr. Nobe (F)

139A. Energy and Kinetics Laboratory.

Prerequisite: courses 103A, 105A, 105D or equivalent. Basic laboratory practice for the study of energy transformation and rate processes. Selected experiments include examples from thermodynamics, heat and mass transfer, chemical and electrochemical processes, cryogenics, chemical kinetics, molecular dynamics, saline water conversion and environmental problems.

Mr. Mills (Sp)

M140A. Solid State Fundamentals.

(Same as course M115A.) 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 (F,W,Sp)

140C. Electronic Structure and Properties of Metals.

Prerequisite: course M115A or M140A. 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. Wagner (W)

140D. Solid State Technology.

Lecture, two hours; laboratory, six hours. Prerequisite: course 16A or 107B. 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 (Sp, even years)

141. Phase Relations and Thermodynamics of Condensed Matter.

Prerequisite: courses 16A or 107B 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. deFontaine (F)

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. Douglass (F)

143A. Selection and Use of Metallic Materials.

Prerequisite: course 142. A moderately advanced study of the structure, properties, and peculiarities of some important types of commercial alloys. Frequent reference to problems and practices associated with the use of specific materials. Steels, aluminum, titanium, and nickel-base alloys will be treated. Mr. Flanigan (W)

144. Vacuum Techniques (Laboratory Course).

Prerequisite: General Chemistry 1A, B, C; General Physics 7A, B, C, D. Laboratory course on Vacuum Techniques. Experiments illustrating vacuum production and measurement, characteristics of the vacuum environment, dependence of physical properties of gases on gas density, physical and chemical interactions at surfaces, processes requiring a vacuum environment. Special Projects. Mr. Bunshah (Sp)

145A. Crystal Structure and X-Ray Diffraction of Materials.

Prerequisite: courses 107B or 107C. Fundamentals of crystallography, properties of x-rays, x-ray diffraction; powder method, Laue method; determination of crystal orientation, and crystal structure; phase-diagram determination; x-ray stress measurements. Mr. Wagner (Sp)

146A. Structure and Properties of Ceramics.

Prerequisite: senior standing. 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 (W)

146B. Processing of Ceramics.

Prerequisite: senior standing. A study of the

processes used in fabrication of ceramics, and relationship to structure and properties. Processing operations including materials preparation, forming and sintering. Effects of thermal and chemical treatments.

Mr. Knapp (Sp)

146C. Properties of Art Ceramic Materials.

Prerequisite: senior standing. 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. (Open to students in Fine Arts.) Mr. Knapp (W, odd years)

*147A. Introduction to Physical Metallurgy.

Lecture, three hours; laboratory, three hours. Prerequisite: course 16A or 107B. 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

147B. Metal Fabrication Processes.

Prerequisite: courses 107B and 107C. 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 (Sp)

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. (Sp, even years)

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 (Sp, odd years)

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 (W)

147F. Welding Metallurgy.

Prerequisite: course 107B, or a course in physical metallurgy (i.e., course 147A). Welding and brazing processes, slags and atmospheres, filler materials, solidification, the fusion zone, the heat-affected zone porosity, segregation, hot and cold cracking, hydrogen embrittlement, residual stress, preheating and postheating, weldability tests, problems with selected materials, occasional laboratory demonstrations. Mr. Flanigan (Sp, odd years)

147L. Metal Fabrication Processes Laboratory. (½ course)

Prerequisite: course 147B. Experimental investigation and analysis of metal forming processes (forging, extrusion, drawing and rolling). Force measurements and energy calculations in metal cutting. Experimental investigation of hot and isostatic pressing of powder. Mr. Shabalk (W)

* Not to be given, 1972-1973.

148. Nondestructive Evaluation of Materials.

Prerequisite: course 107B. Interaction of acoustic wave and electromagnetic radiation with solids. Ultrasonic pulse-echo and spectroscopy. Radiography, magnetic particle, eddy current and fluid penetrant techniques. Practical applications of flaw detection in castings, forgings and pressure vessels. Potential methods including acoustic emission and holography. Mr. Ono (F)

149A. Structure and Properties of Polymers.

Prerequisite: courses 107B, 107C or equivalent. Structure, crystallinity, structure and mechanical properties. Time Independent Behavior: theoretical approach, thermodynamic principles, elasticity. Time Dependent Behavior viscoelasticity, Boltzmann superposition principle, time/temperature superposition, creep. Dynamic Response: viscoelasticity models, structure and dynamic properties, irreversible deformation, structure and fracture processes, environmental effects. Mr. Tetelman (W)

149B. Engineering Design of Polymers.

Lecture, 4 hours; laboratory, 3 hours. **Prerequisite:** course 149A. Engineering fundamentals of polymer processing; relationship between processing techniques, structure and mechanical performance; design of polymers for high mechanical performance, application of fracture mechanics to design; effect of environment; stress/strain/time relationships to performance; reinforced polymers; economics. Mr. Tetelman (Sp)

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. Meecham (F,W)

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. Cole (W,Sp)

151. Performance of Vehicles.

Prerequisite: courses 103A, 105A. Preliminary design analysis of the performance of a variety of vehicles, including automobiles, trains, aircraft, rocket-powered vehicles, ground effect machines, ships and sailboats; performance parameters will include speed, range, payload, efficiency, dynamics and stability, noise, and air or water pollution. Mr. Spaid (Sp)

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 (F)

153B. Acoustics Laboratory.

Laboratory, 8 hours. **Prerequisite:** course 153A (may be taken concurrently) or consent of the instructor.

Experimental studies in the field of acoustics, including audiometry, noise and noise control, acoustical filters, impedance measurements, transducer characteristics and interferometry. Occasional field trips may be necessary to obtain data. Mr. Stern (F)

155. Intermediate Dynamics.

Prerequisite: course 102 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 (Sp)

156A. Advanced Strength of Materials.

Prerequisite: course 108. Stress-strain relations; elastic, plastic, creep and thermal effects. Torsion; elastic and inelastic, Airy's stress functions, stress concentrations. Loads on balls, rollers. Rotating disks, thick hollow spheres, thick hollow circular cylinders, curved beams. Coiled springs. Impact stresses. Mr. Lin, Mr. Nelson (W)

157A-157B. Experimental Techniques in Mechanics and Structures. (½ course each)

Prerequisite: junior standing in Engineering; courses 102, 103A, and 108 (or equivalent); 157A is prerequisite for 157B. (157A offered first five weeks of quarter; 157B offered second five weeks of quarter.)

157A. (Lecture, four hours.) Theory and examples of experimental techniques in mechanics and structures—lectures and demonstrations.

157B. (Laboratory, 8 hours.) Laboratory in one of the principal areas of mechanics (optional choice) through a coordinated experimental sequence including two weeks of creative design of experiments. Mr. Spaid (F,W,Sp)

158A. Elasticity and Plasticity.

Prerequisite: Mathematics 12C. 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, plastic tensile instability. Mr. Felton, Mr. Sines (F,W,Sp)

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 (W)

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 (F)

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 (W)

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.
Mr. Herrick (F)

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 (F,W)

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. Nelson (F,W,Sp)

165N. Application of the Digital Computer to Structures.

Lecture, three hours; discussion, three hours. Prerequisite: courses 165A and 165B or 185A. Development of code algorithms for structure problems. Structural analysis and design on the computer. Structural applications of numerical analysis; topics: simultaneous equations, integration, boundary value problems, initial value problems, eigenvalues and eigenvectors, gradient methods.
Mr. Selna (Sp)

166. Structures III.

Prerequisite: course 165A. Analysis of stress, strain; phenomenological material behavior, fatigue, cumulative damage; bending, extension of beams, unsymmetrical sections, stiffened shell structures; torsion of beams, stress function, warping, thin-walled cross-sections; shear stresses; plate analysis; instability, failure of columns, plates, approximate methods, empirical formulas.
Mr. Dong, Mr. Schmit (F,W)

167A. Design of Steel Structures.

Lecture, three hours; recitation, three hours. Prerequisite: course 165A. Determination of loads. Approximate methods of analysis. Component design by working stress and ultimate strength methods.
Mr. Matthiesen, Mr. Selna (F)

167B. Design of Reinforced Concrete Structures.

Lecture, three hours; recitation, three hours. Prerequisite: course 165A. Design of reinforced concrete buildings. Reinforced concrete beams, columns, and slabs. Working stress and ultimate strength methods of analysis. Determination of loads and design constraints. Introduction to reinforced concrete structural systems.
Mr. Matthiesen, Mr. Selna (W)

168. Design of Aerospace Structural Systems.

Prerequisite: courses 165B, 166; 165B may be taken concurrently. 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, Mr. Hurty (Sp)

169A. Introduction to Mechanical Vibrations.

Prerequisite: course 102. 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. Mingori (F)

171A. Introduction to Feedback and Control Systems: Dynamic Systems Control I.

Lecture, 3 hours; recitation, 1 hour. Prerequisite: introduction to Laplace transforms and ordinary differential equations. Introduction to feedback principles, control systems and stability. Unified introductory treatment of continuous and discrete-time (digital or sampled-data) systems. Control systems modeling applications in engineering and other fields. Emphasis on concepts. Computer-aided problem solving techniques for systems analysis and design.
Mr. DiStefano, Mr. Rosenstein (F,W)

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. DiStefano (Sp)

171C. Dynamic Systems Control II.

Prerequisite: course 171A; introduction to linear algebra. State-space models of continuous and discrete-time dynamic systems. Linear algebra of systems; vector spaces; geometric concepts; transformations and matrices; canonical forms. Stability. Controllability and observability. State representation of nonlinear systems; linearization. Emphasis on modeling concepts, applications, and computer-aided problem solving.
Mr. DiStefano (W,Sp)

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. Leonides

172A. Introduction to the Concepts of Optimization.

Introduction to the theory and computational algorithms for optimization with emphasis on linear programming, duality, and the simplex algorithm. Nonlinear optimization problems: equality and inequality constraints, Lagrange multiplier techniques, gradient methods, dynamic programming, and game theory. Applications to engineering systems.
Mr. Jacobsen (F,W,Sp)

172B. Nonlinear Programming.

Prerequisite: course 172A and some knowledge of computer programming, or consent of the instructor. Theory and computational algorithms for the solution of nonlinear optimization problems. Unconstrained and constrained optimization, Lagrangian procedures, feasible direction methods, and computational considerations.
Mr. Jacobsen (F,W,Sp)

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. Jacobsen (F,Sp)

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 (W)

178A. Kinematics of Mechanisms.

Prerequisite: course 102. 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. Dubowsky (F)

178B. Fundamentals of Mechanical Design.

Lecture, 3 hours; laboratory, 3 hours. Prerequisite: course 102. Techniques of modern design and development of mechanical systems. Application and analysis of basic components and subsystems such as gear trains, bearings, hydraulic and pneumatic subsystems. The dynamics of high-speed machines. Students will create a design of their choice. Mr. Dubowsky (Sp)

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. O'Brien (F)

1809. Machine and Systems Biotechnology.

Prerequisite: course 107A 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 (W)

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 (F, odd years)

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

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 fields trips. Mr. Dracup (F)

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 (W)

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 (Sp)

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. Dracup, Mr. Yeh (W)

185A. Principles of Soil Mechanics.

Prerequisite: courses 108 or 108A; Geology M1 is 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 (F,W)

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 design problems. Soil classification, Atterburg limits, permeability, compaction, shear strength and specific gravity determination. Mr. Lee (Sp)

186A. Elements of Construction.

Lecture, two hours; special projects, field trips, 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. Mr. Matthiesen, Mr. Singh (Sp)

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. Campbell, Mr. Case (F)

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 (W)

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 (W)

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. Campbell, Mr. Case (Sp)

191A. Operational and Transform Methods.

Prerequisite: courses 20A or 100 or 100A, 102; 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 (W)

192A. Mathematics of Engineering.

Prerequisite: course 101A or equivalent. Application of mathematical methods to problems of interest in engineering. The main topic covered is systems of linear ordinary differential equations. Fourier series, transforms, and nonlinear effects are also discussed as related to the solutions of differential equations. Mr. Alexopoulos, Mr. Cole, Mr. Kastenber (F,W,Sp)

192B. Mathematics of Engineering.

Prerequisite: course 192A or equivalent. Applications of mathematical methods to engineering problems are considered. Eigenvalue problems for continuous systems and the related special functions are studied. Mr. Alexopoulos, Mr. Cole, Mr. Kastenber (F,W,Sp)

192C. Mathematics of Engineering.

Prerequisite: course 192A or equivalent. Application of mathematics to engineering problems. A survey of the classical partial differential equations, wave, heat, and potential. The formulation of boundary value problems and analytical and numerical methods are studied. Mr. Alexopoulos, Mr. Cole, Mr. Kastenber (F,Sp)

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. Arunkumar, Mr. Barnes, Mr. Meecham (F,W,Sp)

193B. Engineering Statistics.

Lecture, four hours; laboratory, one hour. Prerequisite: course 193A or consent of the instructor. Fundamental statistical concepts, population (sys-

tem), 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. Arunkumar, Mr. Coleman (W,Sp)

195A. Computer Aided Circuit Design.

Prerequisite: course 110B; also, use of a computer will be required but not taught. Piecewise analysis of large networks. Device modeling. AC, DC and transient analysis of linear and nonlinear networks. Sensitivity and tolerance analysis. Computer-aided circuit optimization. Mr. McNamee, Mr. Temes (W)

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 The Staff

199B. Electrical Sciences and Engineering Department The Staff

199C. Energy and Kinetics Department The Staff

199D. Engineering Systems Department The Staff

199E. Materials Department The Staff

199F. Mechanics and Structures Department The Staff

199G. System Science Department The Staff (F,W,Sp)

Graduate Courses

210A. Advanced Circuit Theory.

Prerequisite: course 110B; concepts of linear algebra and complex functions desirable. Time domain techniques for linear networks; testing positive real matrices; application of Hilbert Transform; introduction to scattering concepts; N-port theory; nonreciprocal networks; energy relationships. Mr. Cotter, Mr. Orchard (F)

210B. Linear Active Circuits.

Prerequisite: course 210A. Fundamental concepts of linear active networks: passivity, activity, and generativity. Limitations on network performance. Theory of broadband matching. Negative resistance, parametric, and feedback amplifier theory. Mr. Bauer (W)

210C. Advanced Network Synthesis.

Prerequisite: course 210A or consent of the instructor. (Not open to students having taken 210A Fall Quarter 1989.) Relations between the real and imaginary parts of network functions; approximation theory; frequency and time-domain interrelations; cascade, ladder and lattice realization of reactance twoports. Mr. Orchard, Mr. Temes (W)

210D. Active, Passive, and Digital Filters.

Prerequisite: course 210C or consent of the instructor. Approximation theory. Realization of passive filters. Electro-mechanical filters. Active filters with lumped and/or distributed elements. Switched and digital filters. Mr. Orchard, Mr. Temes (Sp)

214A. Plasma Waves and Instabilities.

Prerequisite: courses 100B, Physics M122. 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. Jassby (W)

214B. Experimental Plasma Physics.

Prerequisite: Engr. M118 or Physics M122, and Engr. 214A. Case studies of important plasma experiments including the theory and techniques used. Shocks, echoes, nonlinear wave coupling, trapped particle effects, Tonks-Dattner resonances, sheaths and probes, anomalous resistivity, drift instabilities. Mr. Chen (Sp)

214C. Principles of Thermonuclear Fusion.

(Formerly numbered 214B.) Prerequisite: course M118 or Physics M122 and consent of the instructor. 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 (F)

215A. Solid State Electronics I: Interaction of Fields and Solids.

Prerequisite: courses 105B, 115B, 115C, M115A or M140A. Approximation methods in quantum mechanics, lattice vibrations, quantization of electromagnetic field, crystal field theory, interaction of radiation and atoms, magnetic resonance. Mr. Viswanathan (F)

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. Holm-Kennedy (W)

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. Stafsuidd (Sp)

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 (Sp)

215E. Quantum Electronics: Techniques and Devices.

Prerequisite: course 215C or consent of the instructor. Quantum electronic techniques, devices, and systems are discussed phenomenologically. Emphasis is placed upon understanding of the physical mechanisms involved. Selected state of the art methods will be covered where appropriate. Mr. Stafsuidd (W)

216A. Advanced Electronics.

Prerequisite: courses 110B, 116B. Active network theory with particular reference to linear integrated circuits. Design of multistage low pass amplifier. Multistage feedback amplifier, high frequency band pass amplifier, and coupling and matching networks. Mr. Willis (F,Sp)

216B. Modern Electronic and Parametric Devices.

Prerequisite: course 116B. Critical examination of modern electron devices, with emphasis upon

basic operating principles and behavior and performance in system usage. Specific devices to be analyzed may be grouped as follows: semiconductor microwave, parametric, and quantum electronic devices. The Staff (W)

216C. Electronic Systems.

Prerequisite: courses 116B, 116C, 216A. Analysis and synthesis of electronic systems. Systems design as influenced by signal spectra, modulation forms, environment, and characteristics of the propagating media. Mr. Willis (Sp)

217A-217B-217C. Advanced Engineering

Electrodynamics.

Prerequisite: courses 117A, 117B or equivalent. Advanced treatment of concepts in electrodynamics and their applications to modern engineering problems. Waves in anisotropic, inhomogeneous and dispersive media. Guided waves in bounded and unbounded regions. Radiation and diffraction, including optical phenomena. Partially coherent waves, statistical media. Mr. Alexopoulos, Mr. C. W. Yeh (217A-F; 217B-W; 217C-Sp)

*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. The Staff

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. C. W. Yeh (W)

*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. W. Yeh

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 (Sp)

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 (F,Sp)

219C. Seminar: Special Topics in Applied Electronics.

Prerequisite: course 216C or consent of the instructor. Current topics in applied electronics and

* Not to be given, 1972-1973.

electronic systems, such as: Fourier optics, optical data processing, communication systems and techniques, parametric electronics and devices. May be repeated for credit. Staff, Electrical Sciences and Engineering Department (Sp)

219D. Special Topics in Electric Circuit Theory.

Prerequisite: course 210B or 210C or 210D. Advanced treatment of topics chosen from research areas in electric circuit theory.

Mr. Orchard, Mr. Temes (Sp)

219X. Advanced Electrical Science and Engineering Seminar.

Prerequisite: passing of the Ph.D. major field examination or instructor's approval. Seminar on current research topics in solid state and quantum electronics (Section 1) or in electronic circuit theory and applications (Section 2). Each student will report on a tutorial topic and on a research topic in his dissertation area. May be repeated for credit.

Mr. Temes, Mr. Viswanathan (F,Sp)

220A. Stochastic Theory of Queueing Systems I.

Prerequisite: course 120C or consent of the instructor. Stochastic Point Processes. Topics in the theory of queues; the Imbedded Markov Chain Method; equilibrium results for multiple server queues; method of stages; applications to communication, control, and systems optimization.

Mr. Rubin

220B. Stochastic Theory of Queueing Systems II.

Prerequisite: course 220A. Advanced topics in queueing theory and systems; transient behavior, virtual waiting time and busy period, integral equation method, series of queues and priority queues. Inventories, communication, control and systems problems.

Mr. Rubin, Mr. Viterbi (Sp)

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) networks. Tools of network flow theory are developed using graph theoretic methods and are applied to communication, transportation and transmission problems.

Mr. Carlyle, Mr. Rubin (F,Sp)

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. Wang, Mr. Wiberg (F,Sp)

222B. Stochastic Control.

Prerequisite: courses 120B and 122B. Linear stochastic systems, including proof of estimation/control separation theorem, and applications.

Mr. Aoki, Mr. Mortensen (F,Sp)

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. Wang, Mr. Wiberg (W,Sp)

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, Mr. Wiberg (W)

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. Mortensen, Mr. Wang (Sp)

M223A. Queueing Systems: Theory and Application.

(Formerly numbered M220A); same as Management M216A. Prerequisite: course 120A or consent of the instructor. Analysis of queueing (waiting-line) systems. Discrete- and continuous-time Markov processes; birth-and-death processes; baby queueing theory. Equilibrium results for single and multiple server queues; method of stages. Priority queueing. Applications to communication systems, data-processing systems, time-shared processors, computer and communication networks.

Mr. Kleinrock, Mr. Muntz (F)

M223B. Advanced Queueing Theory and Applications.

(Formerly numbered M220B); same as Management M216B. Prerequisite: M223A. Advanced topics in queueing theory: including Lindley's Integral Equation; Pollaczek method; busy period; virtual waiting time; method of collective marks; inequalities, bounds, and approximations; tandem queues; an algebra for queues. Applications to communication and computer nets, computer systems and time-sharing systems.

Mr. Kleinrock, Mr. Muntz

223D. Automatic Deduction: Theory and Applications.

Prerequisites: some knowledge of logic, list-processing languages and programming. Historical development of automatic deduction programs. The resolution principle. Program structure and efficiency strategies. Fundamental meta theorems. Rules of inference for equality and decision procedures. Formalization and axiomatization.

Mr. Luckham

223E. Heuristic Programming and Artificial Intelligence.

Prerequisite: course 123A or 125L or consent of the instructor. Survey of a body of computer programs which successfully perform tasks generally agreed to require some intelligence. The objective is to develop understanding of current research and possibilities of limitations implied by existing experiments in automating intelligent behavior.

Mr. Luckham

223F. Theory of Computation.

Prerequisite: course 123B or equivalent course on automata theory and formal languages. Introduction to the theory of formal models of computer programs: Iano's schemas, program schemas, parallel program schemas, and recursion schemas. Fundamental theorems concerning the problems of correctness, equivalence, and optimization of programs in each formal model will be studied.

Mr. Luckham

224A. Continuous Systems Simulation.

Prerequisite: courses 124A, 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 (Sp)

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. Karplus, Mr. Vidal (W)

225A. Computer System Design: Arithmetic Processors.

Prerequisite: 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 (F)

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 (F)

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 (W)

225D. Computer Memories and Memory Systems.

Prerequisite: course 125B or consent of the instructor. Generic types of memory systems; control, access modes, hierarchies and allocation algorithms. Characteristics, system organization and device considerations of ferrite memories, thin film memories and semiconductor memories.

Mr. W. Chu, Mr. Estrin

225F. Communication of Data in Computer Systems.

Prerequisite: course 125B or 124D. Intraprocessor Communications: communication between processor, memory and input/output. Multiprocessor communication, switching and multiplexing. Multicomputer systems: data rates, block sizes, network and switching problems. Communications with remote multiple terminals: measurements and modeling, multiplexing, error detection and handling.

Mr. W. Chu (Sp)

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 (W)

225L. Advanced Topics in Programming Systems.

Prerequisite: course 125N or consent of the instructor. Theoretical models of compilation. Syntax-directed transduction, tree automata, and tree grammars. Parallel programs, including their structure and translation. Other topics of current research in-

terest in the general field of design and implementation of computer programming languages.

Mr. Martin (F,Sp)

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 (F)

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 (F,W,Sp)

226C. Analytic Models in Operating Systems.

Prerequisite: courses 126C, M223A. Time-sharing system queueing models. Models of program behavior, multilevel memory allocation, paging algorithms. Analysis of file structures. I/O scheduling. Measurement techniques and analysis.

Mr. Muntz (W)

226D. Data Management Systems.

Prerequisite: course 125L or equivalent. Data handling facilities of higher level languages. The concept of management information systems. Data management systems. Languages for information retrieval. Survey of commercially available systems.

Mr. McNamee, Mr. Melkanoff

226R. Computers, Science and Society.

Prerequisite: diversified computer experience and consent of the instructor. (Some background in social science is recommended.) The challenge of computer-serviced societies; experimental evaluation of human effectiveness in man-computer communication; computer utility developments; computers and experimental method; computers and work; computers and human values; information networks and the social order.

Mr. Klinger, Mr. Melkanoff

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. Omura (F,Sp)

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 (W)

227C. Advanced Filtering and Estimation.

Prerequisite: courses 120B and 291A. Advanced methods of determination of optimal statistical estimators in communication systems problems.

Mr. Yao (Sp)

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. Omura, Mr. Yao (Sp)

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. Viterbi (F)

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. Lavan (W)

228B-228C-228D. Theory of Finite Automata.

Prerequisite: course 128D or equivalent mathematical background recommended. Courses 228B-228C are not prerequisite for course 228D. Linear machines and some of their applications: Algebraic theory of automata; decomposition. Theory and application of regular expressions. Probabilistic machines; realizations.
Mr. Carlyle (228B-W; 228C-F; 228D-Sp)

228E-228F-228G. Theory of Formal Languages and Automata.

Prerequisite: course 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 (228E-F,W; 228F-Sp; 228G-G)

228J. Seminar in Automata and Languages.

Prerequisite: three courses in the 228B-228G 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.
Mr. Carlyle, Miss Greibach (W)

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.
Mr. Carlyle, Miss Greibach (F,W)

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. Wang (F)

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. Balakrishnan (W)

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. Balakrishnan (Sp)

229D. Seminar in System Theory.

Prerequisite: 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, Mr. Mortensen (F)

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, queueing systems, etc. Content varies from quarter to quarter. May be repeated for credit.
Mr. Balakrishnan (Sp)

229J-229K-229L. Public Systems Analysis.

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 (229J-F; 229K-W; 229L-Sp)

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, Mr. Robinson (W)

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. Beaman, Mr. Robinson (Sp)

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 (W)

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

***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.

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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 (F)

232A. Combustion Processes.

Prerequisite: course 132A or 137C. Fundamentals: change equations for multicomponent reactive mixtures; rate laws. Applications: combustion, including burning of (a) premixed gases or (b) condensed fuels. Detonation. Sound absorption and dispersion. Pollutant productions in engines, including quenching at combustion-chamber walls and chemical reactions in expanding gases.

Mr. Knuth (Sp)

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 hypersonic boundary layer, ablation and transpiration cooling combustion.

Mr. Mills (Sp)

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 (Sp)

232D. Molecular Dynamics.

Prerequisite: course 130A or 137C. Analysis and design of molecular-beam systems. Molecular-beam sampling of reactive mixtures in combustion chambers or gas jets. Molecular-beam studies of gas-surface interactions; including energy accommodations and heterogeneous reactions. Applications to air-pollution control and to catalysis.

Mr. Knuth (W)

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. Catton (Sp)

234A. Topics in Thermal Design.

Prerequisite: courses 131B, 132A. Consideration of thermal design problems selected from applica-

* Not to be given 1972-1973.

tions 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 (Sp)

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 Weigner Hopf methods.

Mr. Erdmann (F)

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 (W)

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. Erdmann (Sp)

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 (F)

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. Smith (W)

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 (Sp)

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. Nobe (Sp)

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 (Sp)

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. Beamon, Mr. Landolt, Mr. Nobe (W)

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. Beamon, Mr. Landolt, Mr. Nobe (Sp)

238D. Atomic and Molecular Collisions.

Prerequisite: course 180A. 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. Knuth (W)

239A. Seminar: Thermodynamics of Phase Transitions.

Prerequisite: course 180A. 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 (Sp)

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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239B. 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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239S. Energy and Kinetics Department Seminar. (1/2 course)

Prerequisite: graduate standing or consent of the

instructor-in-charge. A series of lectures by faculty and graduate students in the Department of Energy and Kinetics. Invited lecturers will also present topics of current interest to Energy and Kinetics. S/U grading.

Mr. Beamon (F,W,Sp)

241. Oxidation of Metals.

Prerequisite: course 141, or 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 (W)

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 (W, odd years)

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 (Sp, even years)

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. Tetsman (W)

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 (Sp)

245A. Theory of Imperfections.

Prerequisite: course 143A; 158A is recommended. 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 (Sp)

245B. Electrons in Metals.

Prerequisite: an introductory course in atomic physics and wave mechanics such as course M140A, Physics 115A, 115B. 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 (F, even years)

245C. Diffraction Methods in Science of Materials.

Prerequisite: course 145A or equivalent. Theory of the diffraction of waves (x-rays, electrons, and neutrons) in crystalline and non-crystalline materials. Long- and short-range order in crystals, structural effects of plastic deformation, solid-state transformations, arrangements of atoms in liquids and amorphous solids.

Mr. Wagner (F)

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 (F, odd years)

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 (F)

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, (Sp, even years)

246C. Thermodynamic Properties of Refractories at High Temperatures.

Prerequisite: course 141; 146A, 105B or 130A recommended. Techniques for measurement of thermodynamic properties at high temperatures. Critical discussion of data for technologically important refractories. Data and theory for selected multi-component refractory systems.

Mr. Klement (Sp, even years)

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 (Sp, odd years)

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. Ardell (W)

247B. Advanced Solid-State Transformations.

Prerequisite: course 247A. Classical theories of precipitate nucleation and growth, spinodal decomposition, cellular precipitation, eutectoid decomposition, massive transformations, crystallography and kinetics of martensitic transformations, order-disorder transformations, particle coarsening, role of imperfections in precipitation.

Mr. deFontaine (Sp)

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 (F)

248A. Experimental Methods in Materials Synthesis.

Prerequisite: a bachelor's degree in chemistry, physics or engineering. Techniques used in materials synthesis temperature measurement, vacuum techniques, methods of heating and quenching, consolidation and refining of metals, crystal growth, thin film deposition and thick film deposition. Laboratory experiments and demonstrations carried out.

Mr. Bunshah (F)

248B. Theoretical Techniques in Materials Science.

Prerequisite: courses 142, 191A, 192A or equivalents. Applications of linear algebra to crystal geometry, direct and reciprocal space, physical properties of crystals. Fourier transforms in crystal space, applications to diffraction problems. Application of calculus of variations to phase transformations; diffusion and wave equations.

Mr. deFontaine (W, odd years)

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 (F,W)

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. Kelly (W)

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 (Sp)

***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

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. Liu (Sp)

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. Cole (Sp)

* Not to be given, 1972-1973.

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 (Sp)

***252A. Engineering Magnetohydrodynamics.**

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. Cole

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 (W)

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 (W)

***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

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 (W)

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 (Sp)

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. Spaid (F)

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 (F)

255B. Advanced Dynamics.

Prerequisite: course 255A. Variations of Lagrange's equations involving quasis-coordinates; 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 (W)

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 (F)

***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

256D. Theory of Plates and Shells.

Prerequisite: courses 158A, 166 or consent of the instructor. Small and large deformation theories of thin plates; energy methods; free vibrations; membrane theory of shells; axisymmetric deformations of cylindrical and spherical shells including bending. Mr. Hu, Mr. Roberts (W)

256E. Advanced Theory of Shells.

Prerequisite: course 256D or consent of the instructor. Elements of differential geometry for surfaces; fundamental field equations for small deformations of thin shells; applications to shells of revolution; free vibrations; selected current topics in shell theory research. Mr. Hu, Mr. Roberts (Sp)

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 (W)

***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

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. Ito, Mr. Morgan (W)

* Not to be given, 1972-1973.

2588. 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. Ito, Mr. Morgan (Sp)

M258C. Elastic Wave Propagation.

(Same as Planetary and Space Sciences M224A.) 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 (W)

M258D. Elastic Wave Propagation.

(Same as Planetary and Space Sciences M224B.) 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 (Sp)

***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. Gazley, Mr. Liu

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 (F)

259C. Elements of Biomechanics.

Prerequisite: consent of the instructor. An introduction to selected current research problems in Bio-fluid Mechanics and Biomechanical Mechanics. Mr. Collins, Mr. Roberts (Sp)

***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

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 (W)

***260C. Non-Gravitational Astrodynamics.**

Prerequisite: course 160A. Advanced problems in celestial mechanics emphasizing non-gravitational and relativistic effects. Mr. Forster

***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; se-

lection of parameters, variables, and formulae to suit the requirements of various space-orbit determinations. Mr. Herrick

***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

***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

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 (W)

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 (Sp)

***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

***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

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 (F,W)

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. Schmit (W)

* Not to be given, 1972-1973.

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 (Sp)

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, (F,Sp)

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 (W)

267A. Optimum Structural Design I.

Prerequisite: course 265A. Design synthesis of structural systems; techniques for optimization; structural analysis and design by gradient methods; formulation and solution of unconstrained and constrained structural design problems; application to aerospace and civil structures.

Mr. Felton, Mr. Schmit (W)

267B. Optimum Structural Design II.

Prerequisite: course 267A. Continuation of 267A; plastic analysis and design; applications of linear programming in structural design; special techniques for optimization of structural components (columns, beams, etc.); structural indices; variational methods.

Mr. Felton, Mr. Schmit (Sp)

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. Felton, Mr. Matthiesen (F)

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. Matthiesen (F)

268C. Theory of Reinforced Concrete Structures.

Prerequisite: courses 265B, 265D, 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. Selna (Sp)

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. Nelson (F,W)

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 (W)

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 eigenvectors. Applications to civil and aerospace structures.

Mr. Hart (Sp)

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. J. L. Barnes(W)

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 (F)

271A. Dynamic Systems Optimal Control.

Prerequisite: course 171C; 124A or equivalent (124A may be taken concurrently). Optimal control problem formulation. Performance criteria for deterministic dynamic systems. Variational methods and Pontryagin's maximum principle for continuous and discrete-time models. Inequality constraints. Sensitivity analysis. Numerical computation methods for solving boundary value problems of optimal control. Applications in various fields.

Mr. DiStefano, Mr. Leondes (F,Sp)

271B. Dynamic Systems Stochastic Estimation and Control.

Prerequisite: courses 171C; 193A or equivalent; and 271A, (271A may be taken concurrently). Applied treatment of optimal state estimation and stochastic control problems for continuous and discrete-time dynamic models with state-space descriptions. Kalman filtering, smoothing and prediction algorithms. Stochastic optimal controllers; the separation principle. Emphasis on efficient numerical computations. Applications in various fields.

Mr. DiStefano, Mr. Leondes (F,W)

271C. Dynamic Systems Identification, Stability and Adaptive Control.

Prerequisite: courses 271A and 271B; (271B may be taken concurrently). Nonlinear system stability; Liapunov's direct method; phase-plane and describing function methods. Dynamic systems modeling and identification and parameter estimation techniques. Combined identification and control and self-adaptive control.

Mr. Leondes (W)

271D. Seminar and Special Topics in Dynamic Systems Control.

Lecture, 2 hours; laboratory, 2 hours. Prerequisite: courses 271A, 271B, 271C or consent of the instructor.

tor. Interactive seminar on current research topics in dynamic systems modeling, control and applications. Topics selected from process control, physiological control systems, other bioengineering or health-system-oriented problems, differential games, non-linear estimation, adaptive-filtering, etc. Required for Dynamics Systems Control major field Ph.D. students. Mr. Leondes (Sp)

272A. Stochastic Models and Decision Theory.

Prerequisite: course 193A or equivalent, or consent of the instructor. A basic graduate course in applied stochastic processes and Markov decision theory. Counting processes, renewal theory, Markov processes, renewal processes with rewards, optimization in stochastic processes, applications to queueing, inventory and replacement problems.

Mr. Arunkumar (F,W)

272D. Network Flow Theory and Integer Programming.

Prerequisite: course 172A, or consent of the instructor. Fundamental concepts of network and integer programming techniques. Basic notions of graph theory, flows through networks, minimum cost and multicommodity flows, pure and mixed integer programming algorithms. Applications to plant location, project planning, scheduling, and network synthesis problems.

Mr. Jacobsen (W,Sp)

272C. Optimization Methods for Large-Scale Systems.

Prerequisite: course 172B or consent of the instructor. Theory and computational procedures for solving discrete and continuous time optimization problems. Emphasis on high dimensional systems. Kuhn-Tucker theory, duality, decomposition, generalized linear programming. Applications to optimal control, stochastic programming, and large-scale systems.

Mr. Jacobsen (W,Sp)

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. Leondes (Sp)

M275A. Statistical Design of Engineering Experiments.

(Same as Management M215F.) 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 (W)

275B. Reliability Theory with Applications.

Prerequisite: courses 193A, 193B or consent of the instructor. Basic graduate course in reliability theory. Reliability models for complex systems, coherent structures, modular decomposition, reliability bounds. Constant, monotone hazard functions. Optimization problems in reliability: redundancy allocations, maintenance policies, stress-strength and safety considerations in engineering design. Statistical problems, current topics.

Mr. Arunkumar (Sp)

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

276A. Computer-Aided Design.

Prerequisite: courses 106B or equivalent, and 172A; 172B recommended. Seminar in computer-aided design of engineering systems and products. Organization of the design process, its decision points and back-up information, for automatic machine processing of the specifications to provide full design data for a family of products.

Mr. Rosenstein (W)

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 (Sp)

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 (F)

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. Dubowsky (W)

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 (W)

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 (Sp)

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. W. G. Yeh

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. G. Yeh (W)

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. W. G. Yeh (Sp)

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 (Sp)

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 (W)

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. Dracup (Sp)

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. Dracup, Mr. W. G. Yeh (F)

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 (F)

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. Lee, Mr. Singh (W)

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 (Sp)

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. Lee, Mr. Singh (Sp)

286A. Earthquake Engineering.

Prerequisite: courses 256A or 265A or 285A or 169A. 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 (W)

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. Matthieson (Sp)

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 (F,W,Sp)

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. Cole, Mr. Levan (W,Sp)

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 (Sp)

M282A. Asymptotic and Perturbation Methods I.

(Same as Mathematics M274A.) Prerequisite: course 192A or equivalent; Mathematics 132 or equivalent. The fundamental mathematics of asymptotic analysis, asymptotic expansions of Fourier integrals, method of stationary phase, Watson's lemma method of deepest descent, uniform asymptotic expansions, elementary perturbation problems.

Mr. Cole, Mr. Maki

M282B. Asymptotic and Perturbation Methods II.

(Same as Mathematics M274B.) Prerequisite:

course M292A. The fundamental mathematics of asymptotic analysis, limit process expansions, regular and singular perturbation problems, matching of asymptotic expansions, multiple scale methods, application to partial differential equations, near and far fields.
Mr. Cole, Mr. Muki

295A. Advanced Methods of Computer Aided Circuit Design.

Prerequisite: course 195A. A study of the latest advances in computer aided circuit design: analysis of nonlinear and distributed circuits, statistical tolerance analysis, constrained circuit optimization via linear and nonlinear programming, computer-aided synthesis, and on-line design techniques.
Mr. McNamee, Mr. Temes (Sp)

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

M299A. Elements of Planning Theory.

Lecture, 3 hours; discussion, 2 hours.
(Same as Architecture and Urban Planning M201B.) Prerequisite: second year graduate standing. The course provides a broad overview of the history of planning theory and focusses on current theories concerning the linkage of a scientific-technical intelligence to organized social actions.
Mr. Friedman (F)

M299C. Large-Scale Mathematical Programming.

(Same as Management M211B.) 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 variable and/or constraints.
The Staff (Sp)

M299D. Network Flows and Combinatorial Programming.

(Same as Management M210C.) Prerequisite: consent of the instructor. Theory and techniques of discrete models in operations research. Integer programming, combinatorial programming, and network flows. Applications to various allocations, coordination, scheduling and sequencing problems.
The Staff (Sp)

†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

†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

†472A-472B-472C-472D. The Engineer in the Business Environment. (1, 1, 1, ½ 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

†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 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

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 (F,W,Sp)

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 (F,W,Sp)

597A. Preparation for M.S. Comprehensive Examination. (½ to 2 courses)

Prerequisite: graduate status; application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. Reading and preparation for M.S. comprehensive examination.
The Staff (F,W,Sp)

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 (F,W,Sp)

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 (F,W,Sp)

598. Research for and Preparation of the Master's Thesis. (½ to 2 courses)

Prerequisite: graduate status; application forms to request enrollment may be obtained from the Assistant Dean, Graduate Studies. Supervised independent research for M.S. candidates, including thesis prospectus.
The Staff (F,W,Sp)

599. Research for 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 (F,W,Sp)

ENGLISH

(Department Office, 2225 Rolfe Hall)

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.*

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.*

Paul Alfred Jorgensen, Ph.D., *Professor of English.*

Jascha Kessler, Ph.D., *Professor of English.*

Robert Starr Kinsman, Ph.D., *Professor of English.*

Richard D. Lehan, Ph.D., *Professor of English (Chairman of the Department).*

Lois McIntosh, Ph.D., *Professor of English.*

Blake Reynolds Nevius, Ph.D., *Professor of English.*

Ada Blanche Nisbet, Ph.D., *Professor of English.*

Maximilian Erwin Novak, Ph.D., *Professor of English.*

James Emerson Phillips, Jr., Ph.D., *Professor of English.*

John Frederick Povey, Ph.D., *Professor of English.*

Clifford Holmes Prator, Ph.D., *Professor of English (Vice Chairman of the Department).*

Joseph N. Riddel, Ph.D., *Professor of English.*

Florence Ridley, Ph.D., *Professor of English.*

Alan Henry Roper, Ph.D., *Professor of English.*

William David Schaefer, Ph.D., *Professor of English.*

Hugh Thomas Swedenberg, Jr. Ph.D., *Professor of English.*

Georg Bernhard Tennyson, Ph.D., *Professor of English.*

Peter Larsen Thorslev, Ph.D., *Professor of English (Vice Chairman of the Department).*

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.*

Leon Howard, Ph.D., L.H.D., *Emeritus Professor of English.*

Claude Jones, Ph.D., *Emeritus Professor of English.*

Alfred Edwin Longueil, Ph.D., *Emeritus Professor of English.*

William Matthews, Ph.D., Litt.D., *Emeritus Professor of English.*

Franklin Prescott Rolfe, Ph.D., *Emeritus Professor of English.*

Calvin Bernard Bedient, Ph.D., *Associate Professor of English.*

Frederick Lorrain Burwick, Ph.D., *Associate Professor of English.*

Russell Norman Campbell, Ph.D., *Associate Professor of English.*

Ronald E. Freeman, Ph.D., *Associate Professor of English.*

Robert A. Georges, 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.*
 Richard Alan Lanham, Ph.D., *Associate Professor of English.*
 J. A. Leo Lemay, Ph.D., *Associate Professor of English.*
 Earl James Rand, Ph.D., *Associate Professor of English.*
 George S. Rousseau, Ph.D., *Associate Professor of English.*
 Paul Roland Sellin, Ph.D., *Associate Professor of English.*
 Robert D. Wilson, *Associate Professor of English.*
 Michael J. B. Allen, Ph.D., *Assistant 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.*
 Steven Latimer Bates, Ph.D., *Assistant Professor of English.*
 Charles Linwood Batten, Jr., Ph.D., *Assistant Professor of English.*
 Charles Ashton Berst, Ph.D., *Assistant Professor of English.*
 Albert R. Braunmuller, Jr., Ph.D., *Assistant Professor of English.*
 Daniel G. Calder, *Assistant Professor of English.*
 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.*
 Patrick K. Ford, Ph.D., *Assistant Professor of English.*
 Sandra J. Garcia, Ph.D., *Assistant Professor of English in Residence.*
 Christopher Waldo Grose, Ph.D., *Assistant Professor of English.*
 Alexander Lance Hammond, Ph.D., *Assistant Professor of English.*
 Evelyn R. Hatch, Ph.D., *Assistant Professor of English.*
 Loyce Randel Helms, Ph.D., *Assistant Professor of English.*
 Albert Davis Hutter, Ph.D., *Assistant Professor of English.*
 Gordon Lee Kipling, Ph.D., *Assistant Professor of English.*
 G. Jackson Kolb, II, Ph.D., *Assistant Professor of English.*
 Ralph Charles LaRosa, Ph.D., *Assistant Professor of English.*
 Kenneth Robert Lincoln, Ph.D., *Assistant Professor of English.*
 Robert M. Maniquis, Ph.D., *Assistant Professor of English.*
 Donald Glenn Marshall, Ph.D., *Assistant Professor of English (Vice Chairman of the Department).*
 John W. Oller, Ph.D., *Assistant Professor of English.*
 Robert Alvin Rees, Ph.D., *Assistant Professor of English.*
 David Stuart Rodes, Ph.D., *Assistant Professor of English.*
 Karen Elizabeth Rowe, Ph.D., *Assistant Professor of English.*
 Paul Douglas Sheats, Ph.D., *Assistant Professor of English.*
 Matthew Victor Skulicz, Ph.D., *Assistant Professor of English.*
 Ben Merchant Vorpahl, Ph.D., *Assistant Professor of English.*
 Thomas Richard Wortham, Ph.D., *Assistant Professor of English.*
 Stephen Irwin Yenser, Ph.D., *Assistant Professor of English.*

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Jerome Cushman, A.B., B.S.L.S., *Senior Lecturer in English and Library Service.*
 Raymund Arthur Paredes, M.A., *Acting Assistant Professor of English.*

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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 pages 41-42 of this bulletin.

Preparation for the Major

English 2, 10A, 10B, 10C taken in sequence, each course being a prerequisite for the next course; completion of these four courses and English 140 satisfies the College of Letters and Science "D" requirement in English composition.

Foreign Language and Foreign Literature Requirement. All English majors graduating after the summer of 1973 must have completed either (1) the fifth course or its equivalent in any one foreign language or (2) any combination of five courses in foreign language and foreign literature, including Foreign Literature in Translation (see catalog page 301 and Humanities (see catalog, page 351). (High school language courses count toward this requirement in number 1 but not number 2.)

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 courses numbered 150-190; (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.

Special Programs

The Department offers special programs in American Studies, General Literature, and Creative Writing, for all of which the regular "Preparation for the Major" courses as

well as the departmental foreign language requirement apply. Because of the specialized nature of these programs, students planning to do graduate work in English should consult the departmental advisor before selecting any one of them.

American Studies: This program consists of nine upper division English courses and six related upper division courses taken in other Departments. The nine English courses must include 140 (Criticism); 142A-B (Shakespeare); three courses chosen from 170, 171, 172, 173, 174 (American Literature); one course pertaining to "American Studies" chosen from the 180 series (Specialized Studies) or the 190 offerings (Literature and Society), taken preferably in the senior year. The remaining two English courses and the six upper division courses from other departments must be chosen in consultation with the departmental adviser. A complete listing of acceptable courses arranged into possible emphases under this program (American Civilization, Popular Culture, Folklore, Ethnic Studies), as well as suggestions for fulfilling the College "Breadth Requirements," may be obtained from the Department of English (Rolfe Hall 2225).

General Literature: This program consists of nine upper division courses in English or American Literature, and six upper division courses in Foreign Literatures (at least one of which must be taught in the original language, not a study of works in translation). The nine English courses must include 140 (Criticism); 142A-B (Shakespeare); 141 (Chaucer) or 143 (Milton); at least one course from the 150 series, one from the 160 series, and one from the 170 series; and two electives chosen from courses numbered 141 through 190. A listing of acceptable courses arranged into possible emphases under this program may be obtained from the Department of English (Rolfe Hall 2225).

Creative Writing: This program consists of English 140 (Criticism), 142A-B (Shakespeare), and a minimum of nine additional upper division English courses: three Creative Writing courses from the 133-135 series, taken in a single genre (poetry, short

story, or drama); three literature courses paralleling the creative writing specialization (for example, three courses in the study of poetry for students pursuing the writing of poetry); and three electives chosen from courses numbered 141 through 190. Students will be admitted to this program only upon recommendation of their instructor after completing 133A or 134A or 135A; for further details see the Department of English (Rolfe Hall 2225).

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; and Speech 1. The following 12 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; 122K, 150; 142A and 142B; and three additional courses from those numbered 141-199. The student may fulfill the department foreign language requirement with his native language. Students who complete this major and wish to pursue graduate study should consult with the department counselor about programs of study and requirements for admission.

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, M111A, 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 (Rolfe Hall 2225).

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 stu-

dents 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 148-149. 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 pages 150-151. 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 beginning 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; three courses numbered 220 to 269, at least one of which must be from a period before 1800, and one of which must be a seminar (240-269); 270; 272 or 275; 120; elective in English; unrestricted elective. (Recommended electives: English 121, 123, 130, 190; Humanities 100 series; Linguistics 100, 123, 170, 190.) (b) *Language:* 201 or 140; two courses numbered 220 to 269; 120; 121 or 122; 213; 240 or 241; 270; unrestricted elective. (Recommended electives: English 120, 130, 210, 211, 212, 250K, 270, 272, 275; Linguistics 170, 225R.) (c) *Creative Writing:* 201 or 140; three courses numbered 220 to

269; three courses selected from English 133A-B-C, 134A-B-C, 135A-B-C; 270; 120. (d) *English for Minority Groups*: 201 or 140; two courses numbered 220 to 269; 120 or 122; 123; 272; 275; elective in literature of minority groups; unrestricted elective. (Recommended electives: English 109K, 114, 130, 190, 270; Education 102; Linguistics 100, 170; Sociology 124, 155.)

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 151. The Ph.D. is primarily a research degree and the Department's program is designed for students intending to teach in college and universities. Qualifying examinations are given twice a year.

2. *Foreign Language*. In addition to fulfilling the departmental Philology requirements, 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 graduate course 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 doctor'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 either (a) English 211 and 212; or (b) two courses chosen from English 213, 214, 215, 240A, 240B, 241A, 241B; 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 and at some time before the Part II Qualifying Examination he must have taken one seminar in some

field other than that of his specialization. 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 a dissertation which must be approved by the Certifying Members of his Doctoral Committee. A final oral examination may also be required.

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. Critical Reading and Writing.

Prerequisite: completion of the Subject A requirement. An introduction to literary analysis, with close reading and careful written exposition of selections from the principal modes of literature: poetry, prose fiction, and drama. Minimum of six papers. The Staff

5A. Historical Backgrounds of English Literature to 1660.

Prerequisite: course 2. Historical, political, and economic backgrounds of English literature from Anglo Saxon times to the Restoration. Mr. Kelly

5B. Historical Backgrounds of English Literature, 1660 to the Present.

Prerequisite: course 5A. A continuation of the

historical, political, and economic backgrounds of English literature. Mr. Helms

10A. English Literature to 1660.

Prerequisite: English 2. A study of selected works of the major writers of the period, beginning with selections from Old English poetry, and including Chaucer, Spenser, Shakespeare, Donne, and Milton. Minimum of three papers. The Staff

10B. English Literature, 1660-1832.

Prerequisite: English 10A. A study of selected works by the major writers of the period, including Dryden, Pope, Swift, Wordsworth, and Keats. Minimum of three papers. The Staff

10C. English Literature, 1832 to the Present.

Prerequisite: English 10B. A study of selected works by the major writers of the period, including Tennyson, Arnold, Browning, Yeats, Joyce, and Eliot. Minimum of three papers. The Staff

70. Contemporary Themes in British and American Literature.

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

Subject A is prerequisite for courses 100-123, except 118. Subject A and English 2 are prerequisite for courses 130-135; consent of the instructor following submission of samples of creative work is required for enrollment in courses 133-135. Subject A, English 2, and English 10A-10B-10C are prerequisite for courses 140-199.

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 devel-

opment, 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**

M111A. The Literature of Myth and Oral Tradition.

(Same as Folklore M111.) A study of myth, dramatic origins, oral epic, folk tale and ballad, emphasizing Indo-European and Semitic examples. **Mr. Arpad**

M111B. Anglo-American Folk Song.

(Same as Folklore M106.) 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**

M111C. Introduction to British Folklore and Mythology.

(Same as Folklore M121.) Prerequisite: junior standing. A survey of the folklore of the peoples of Britain, with attention to their history, function, and regional differences. **Mr. Georges**

M111D. Introduction to Celtic Folklore and Mythology.

(Same as Folklore M122.) 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. **Mr. Ford**

111E. Survey of Medieval Celtic Literature.

A general course dealing with Celtic literature from the earliest times to the fourteenth century. No knowledge of Irish or Welsh is required. **Mr. Ford**

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. Holmes**

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. Fovey**

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. Daxham, 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. Kessler, Mr. LaRosa**

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. Rees**

118. Afro-American Literature.

The Black experience as reflected in the development of Black American literature. This course relates Afro-American writing to its salient cultural and social condition. It explores recurrent and characteristic themes, techniques and genres from slavery to the present. **The Staff**

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. Garcia, 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. Skaliotis**

122. Introduction to the Structure of Present-Day English.

An introduction to the techniques of linguistic description as applied to the pronunciation, grammar and vocabulary of modern English. **Mr. Arthur, Mr. Rand**

123. Afro-American English.

Prerequisite: English 120 or Linguistics 100; pre- or co-requisite: English 123 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**

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.

Prerequisite: consent of the instructor. 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. Gullams, Mr. Kessler**

134A-134B-134C. Creative Writing: Short Story.

Prerequisite: consent of the instructor. 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. Kessler, Mr. Rhodes

140. Criticism.

Prerequisite: English 10C. An introduction to some types of literary criticism. The student will study such matters as reader's response and rationales of literary description, analysis, and evaluation. He will read literary works in the context of both practical and theoretical criticism. Minimum of five essays. 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; e.g., the Gawain-poet, Langland, Gower, Malory, miracle and morality plays, prose, lyrics, and the minor poems of Chaucer. The more difficult texts will be read in modernized form. Mr. Condren, Mr. Kipling

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. Bates, Mr. Edinger, Mr. Lanham

152. The Drama to 1842.

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

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. Bates, Mr. Guffey, Mr. Grose

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. Canfield, Mr. Roper

155. Literature of the Later Eighteenth Century (1730-1790).

A study of major works as literary documents and as products of later eighteenth-century thought. Mr. Batten, Mr. Rousseau, Mr. Story

156. The Drama, 1660-1842.

A survey of the English drama from the Restoration to the Licensing Act. Mr. Batten, Mr. Canfield, Mr. Rhodes

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, Shelley, and Byron, with collateral readings from such authors as Hazlitt, Hunt, Landor, Clare, Moore, and Peacock. Mr. Burwick, 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. Cristensen, Mr. Freeman, Mr. Kolb

163. Victorian Prose.

A study of major prose writers of the Victorian period, including Carlyle, Ruskin, Arnold, Mill, Newman, Pater, and Wilde. Mr. Christensen, Mr. Tennyson

164. The Novel, 1832-1900.

A survey of the major English novelists from Dickens through Hardy. Mr. Berst, Mr. Hutter, Mr. Lincoln

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. Bedient, Mr. Fiero

166. The Novel, 1900 to the Present.

A survey of the major English novelists from Conrad to the present. Mr. Bedient, Mr. Berst

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, Mr. Braummuller

170. American Literature to 1800.

A historical survey of American literature through the Colonial and Early National Periods. Mr. Hammond, 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. Vorpahl, Mr. Wortham

173. Twentieth Century American Poetry.

The development of American poetry since 1912, including Frost, Eliot, Pound, and Stevens. Mr. Fiero, Mr. Gallans, 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, Mr. LaRosa, Mr. Rees

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. Enrollments for each course are handled in the department office (Rolfe Hall 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. Gaffey, 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. Thorslev

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

210. History of the English Language.

(Formerly numbered 212.) A detailed study of the history, characteristics, and changing forms of the language from its origin until about 1900.

Mr. Condrea, Mr. Skulics

211. Readings in Old English Literature.

(Formerly numbered 210.) Study of Old English grammar, lexicon, phonology, and pronunciation to enable the student to read the literature silently and aloud. Reading of as much as of the more interesting Old English prose and poetry as can be read in a quarter. Mr. Condrea

212. Readings in Middle English Literature.

(Formerly numbered 211.) Prerequisite: course 211. Detailed study of the linguistic aspects of Middle English and of representative examples of the better prose and poetry. Miss Ridley

213. Advanced Study in the History of the Language (since 1500).

Detailed study of the language's history and characteristics since 1500. Phonological, grammatical, lexicographical developments will be studied in relation to accompanying intellectual, political, social ones, and the whole complex related to literature through analytical papers in students' particular specialties. Mr. Bowen, Mr. Skulics

214. Modern English.

Study of contemporary written and spoken English, with emphasis upon (1) dialectal differences in pronunciation, grammar, vocabulary, as illustrated in the speech of students and instructor, and (2) analysis of English and American writings of varying social and dialectal types. Mr. Bowen, Mr. Wilson

215. The Structure of Present-day English.

Prerequisite: course 122K or 122. Investigation in depth of the basic constructs and sub-systems of English structure as described by grammarians of various theoretical persuasions. Mr. Bowen, Mr. Wilson

216A-216B. Old Irish.

Prerequisite: consent of instructor. Studies in grammar. Readings in the glosses and other texts. Comparative considerations. Mr. Ford

217A-217B. Medieval Welsh.

Prerequisite: consent of instructor. Studies in grammar. Readings in the *Mabinogi* and other texts. Comparative considerations. Mr. Ford

218. Celtic Linguistics.

Prerequisite: consent of 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. Mr. Ford

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. Tennyson

226A. Readings in American Literature to 1828.

Mr. Lemay

226B. Readings in American Literature: 1828-1912.

Mr. Falk, Mr. Nevius

227. Readings in American Literature: 1912 to the Present.

Mr. Durham, Mr. Lohan, Mr. Nevius

228. Readings in Twentieth Century British Literature. Mr. Adams, Mr. Espey, Mr. Kessler

Graduate Seminars

Seminars are open to all graduate students with adequate preparations, and may be repeated for credit. Enrollment is by consent of the instructor, and continuing students are asked to sign up for seminars before the end of the preceding quarter. A prospectus announcing topics for all seminars will be available in the department office by June 1 for the ensuing academic year.

240A. English Dialects.

Study of various dialects: standard English, American rural, American urban, British regional, Middle English, etc., and their representation in literature, slang, stage dialects, etc., the field and limits of investigation to be chosen by the individual instructor.

Mr. Arthur

240B. Language and Literature.

The application of linguistics to literary analysis. Individual seminars will deal with: an historical period, Medieval and Renaissance, Neo-classical, or Nineteenth century and modern; specific authors; or the contributions of specific groups of linguists to literary analysis.

The Staff

241A. Historical English Grammar.

Topics in various historical aspects of the English language: at different times, phonology, dialectology, syntax, semantics.

Mr. Stockwell

241B. Modern English Grammar.

Prerequisite: consent of the instructor. Topics in various aspects of the structure of modern English, especially syntax and semantics.

The Staff

M243A. The Ballad.

(Same as Folklore M243A.) Prerequisite: consent of the instructor. A study of the English and Scottish popular ballads and their American derivatives, with some attention to European analogues.

M243B. Problems in Ballad Scholarship.

(Same as Folklore M243B.) Prerequisites: M243A or consent of the instructor. Intensive investigation of a problem or problems in the study of the popular ballad.

Mr. Wilgus

244. Old English Literature. Mr. Calder, Mr. Condren

245. Medieval English Literature. Miss Ridley

246. Chaucer and His Contemporaries. Miss Ridley

247. Early Tudor Literature.

Mr. Kinsman, Miss Ridley

248. Middle English Dialects.

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, 1680-1790. 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

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. Lemay

267. Major American Writers. Mr. Falk, Mr. Nevius

268. Trends in American Literature.

Mr. Falk, Mr. Lehan

269. Theoretical Criticism. Mr. Adams, Mr. Lehan

Special Courses for the Master's Degree

270. The 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

273. Studies in Afro-American Literature.

Intensive research and study of major themes, issues, and writers in Afro-American literature. Discussions and research on the esthetic, cultural, and social backgrounds of Afro-American writing.

The Staff

275. Teaching English to Minority Groups.

Pre- or co-prerequisite: 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.

May not be used to satisfy any course requirement for a degree. M.A. students may enroll by petition only; Ph.D. students restricted to one course (four units) before the First Qualifying Examination. (Exceptions by petition.)

The Staff

597. Preparation for the Doctoral Examination.

Ph.D. Candidates restricted to one course (four units) before the Second Qualifying Examination. (Exceptions by petition.)

The Staff

599. Dissertation Research.

Enrollment restricted to Ph.D. Candidates unable to enroll in seminars in their fields, or Candidates concurrently enrolled in such seminars.

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 1 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 pages 41-42 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 122K, 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 122K, and English 250K. Plan I as established by the Graduate Division (see page 147), 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 215, 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 89C 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. Oller, Mr. Smith

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 89C 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. Arthur, Mr. Povey, Mr. Rand

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. Povey, Mr. Rand

109J. Introduction to Literature (for Foreign Students).

Prerequisite: course 89C 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. Povey

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. Rand

122K. Introduction to the Structure of Present-Day English (for Teachers of English as a Second Language).

Prerequisites: course 120 or Linguistics 100. Introductory study of the phonological and gram-

matical structure of English leading to familiarization with the terminology and assumptions of traditional, structural, and transformational grammar.
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. Campbell, Miss McIntosh, Mr. Wilson

251K. Bilingual Comparative Studies. Seminar.

Prerequisite: courses 218 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. Mrs. Hatch

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. Language Policy in Developing Countries. 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. Campbell, 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

388K. 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. Campbell, Mrs. Hatch, Miss McIntosh

Individual Study and Research

598K. 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 Preparation 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. Arthur, Mr. Campbell

■ FOLKLORE AND MYTHOLOGY GROUP (INTERDEPARTMENTAL)

(Department Office, 11-380 Bunche Hall)

Marija Gimbutas, Ph.D., *Professor of European Archaeology.*

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.*

Jaen 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.*

Shirley L. Arora, Ph.D., *Associate Professor of Spanish.*

Robert A. Georges, Ph.D., *Associate Professor of English and Folklore.*

Julio Rodrigues-Puértolas, Ph.D., *Associate Professor of Spanish.*

Patrick K. Ford, Ph.D., *Assistant Professor of English.*

Joseph J. Arpad, Ph.D., *Assistant Professor of English.*

Michael Owen Jones, Ph.D., *Assistant Professor of History and Folklore.*

James Porter, M.A., *Assistant Professor of Music and Folklore.*

Rodney N. Vlasak, B.A., *Assistant Professor of Music.*

———, *Assistant Professor of Folklore and Mythology.*



Marianna D. Birnbaum, Ph.D., *Lecturer in Hungarian.*

Paulo D. Carvalho-Neto Ph.D., *Lecturer in Portuguese.*

Inkeri Rank, M.A., M.Ed., *Lecturer in Finnish Studies.*



Alexander Badawy, Ph.D., *Associate Professor of Art.*

Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*

Kenneth G. Chapman, Ph.D., *Professor of Scandinavian Languages.*

Margherita Cottino-Jones, Ph.D., *Associate Professor of Italian.*

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 Ellinson, Ph.D., *Assistant Professor of Sociology.*

David C. Epstein, Ph.D., *Assistant Professor of Anthropology.*

Samuel Farber, Ph.D., *Assistant Professor of Sociology.*

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.*
 Boris A. Kremenliev, Ph.D., *Professor of Music.*
 Hilda Kuper, Ph.D., *Professor of Sociology.*
 Leo J. Kuper, Ph.D., *Professor of Anthropology.*
 Milan S. La Du, Ph.D., *Professor of French.*
 Steven Lattimore, Ph.D., *Assistant Professor of Classical Archaeology.*
 Wolf Leslau, Ph.D., *Professor of Hebrew and Semitic Linguistics.*
 Josefina M. Mendez, Ed.D., *Lecturer in Spanish.*
 Michael Moerman, Ph.D., *Associate Professor of Anthropology.*
 David Morton, Ph.D., *Associate Professor of Music.*
 Philip Newman, Ph.D., *Associate Professor of Anthropology.*
 Wendell H. Oswalt, Ph.D., *Professor of Anthropology.*
 Florence H. Ridley, Ph.D., *Professor of English.*
 William B. Rodgers, Ph.D., *Associate Professor of Anthropology.*
 Arnold Rubin, Ph.D., *Associate Professor of Art.*
 Georges Sabagh, Ph.D., *Professor of Sociology.*
 Stephen P. Schwartz, Ph.D., *Assistant Professor of German.*
 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 and Germanic Languages.*
 Donald J. Ward, Ph.D., *Associate Professor of German.*
 Lora S. Weinroth, Ph.D., *Assistant Professor of French.*
 Johannes Willbert, Ph.D., *Professor of Anthropology.*
 Dean S. Worth, Ph.D., *Professor of Slavic Languages.*
 Jules Zentner, Ph.D., *Assistant Professor of Scandinavian Languages.*

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 Committee 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 M105 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 page 147.

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 M106, 142, M144, M154A-154B, M181; M183; Music 140A-140B-140C, 142, 143A-143B, 145, 146, 147, 190A-190B.

Group 2. Folklore 120, M121, M122, M123A-123B, M124, M125, M126, M128, M129, 141, M149, M150, 221, M230A-230B, M241, M249; African Languages 150A-150B; French 115A, 215A-215B-215C-215D-215E; German 134, 240A-240B-240C, M245A-245B; Scandinavian 141, M245.

Group 3. Folklore 213, 217, M243A, M243B, 251, M258, 259, M286A-286B-286C; English 220; German 262; 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 fellowships, 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.

Lower Division Course

M15. Introduction to American Folklore Studies.

(Same as History M15.) Lecture and discussion. A cultural-historical survey of the role of folklore in the development of American civilization and of the influence of the American experience in shaping folklore in American society; attention will also be given to representative areas of inquiry and analytical procedures. Mr. Jones

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

M105. Folklore in American Society.

(Same as History M105.) Prerequisites: Folklore or History M15 or Folklore 101. Lecture and discussion. An examination of folkloristic data within the context of American cultural history, the means of identifying and analyzing traditional expressive behavior, and the kinds of research opportunities available to those with an interest in the interrelationships between folklore and other aspects of American social behavior. Mr. Jones

M106. Anglo-American Folk Song.

(Same as English M111B.) 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

M111. The Literature of Myth and Oral Tradition.

(Same as English M111A.) A study of myth, dramatic origins, oral epic, folktale, and ballad, including 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.

M121. Introduction to British Folklore and Mythology.

(Same as English M111C.) 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

M122. Introduction to Celtic Folklore and Mythology.

(Same as English M111D.) 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. Mr. Ford

M123A. Introduction to Finnish Folklore and Mythology.

(Same as Scandinavian Languages M123A.) Prerequisite: consent of the instructor. The methods and results of Finnish folklore studies and the mythic traditions of the Finns. Special attention is paid to the oral epic, beliefs and legends. Mrs. Rank

M123B. Finnish Folksong and Ballad.

(Same as Scandinavian Languages M123B.) Prerequisite: consent of the instructor. A survey of Finnish balladry and folksong, with attention to historical development, ethnic background, and poetic and musical values. Mrs. Rank

124. Finnish Folk Art and Technology.

Material manifestations of Finnish folk culture:

village layout and architecture, folk technology, arts, and crafts, textiles, costumes and design. Mrs. Rank

M125. Folklore and Mythology of the Lapps.

(Same as Scandinavian Languages M125.) Prerequisite: consent of the instructor. Survey of Lappish beliefs, customs, and various genres of oral tradition including tales, legends, songs and music. Attention is also paid to the material manifestations of Lappish culture: arts and crafts, textiles, costume, folk technology. Mrs. Rank

M126. Introduction to Baltic and Slavic Folklore and Mythology.

(Same as Slavic Languages M179.) A general course for students interested in folklore and mythology and for those interested in Indo-European mythic antiquities. Mrs. Gimbutas

M128. Introduction to Hungarian Folklore and Mythology.

(Same as Hungarian M135.) A general course for the student in folklore and mythology, with emphasis on types of folklore and varieties of folklore research. Mrs. Birnbaum

M129. Folklore and Mythology of the Ugric Peoples.

(Same as Hungarian M136.) Survey of the traditions of the smaller Ugric nationalities (Voguls, Ostyaks). Mrs. Birnbaum

130. North American Indian Folklore and Mythology Studies.

Prerequisite: Folklore 101 or consent of the instructor. An examination of folkloristic and mythological data recorded from various North American Indian peoples within the contexts of the principal ideological frameworks which have been evolved historically for the analysis of such data. Mr. Georges

141. Oral Art and Drama of Non-Western Peoples.

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.

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.

M144. American Folk and Popular Music.

(Same as Music M144.) 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.

The historical development of the study of oral literature among preliterate people; theoretical bases for the analysis of oral traditions.

M149. Folk Literature of the Hispanic World.

(Same as Spanish M149.) 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

M150. Russian Folk Literature.

(Same as Russian M150.) Prerequisite: Russian 16. Mr. Markov

M154A-154B. The Afro-American Musical Heritage.

(Same as Music M154A-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-Brazilian musical traditions.

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.

M180. Transcription, Analysis and Classification of Folk Music.

(Same as Music M180.) Prerequisite: course M144 or Music 140A, 140B, or 140C. An intensive study of methods and techniques necessary to the understanding of folk music. Mr. Porter

M181. Folk Music of Central and Western Europe.

(Same as Music M181.) 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

M183. Ethnography of Blues.

(Same as Music M183.) Prerequisites: 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

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. Mr. Georges

213. Folk Belief and Custom.

Prerequisites: course 101 and any one of the following courses: M105, 118, M121, M122, M123A-123B, 124, M125, M126, M128, M149, M150; 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 M105, M106, or M111; also recommended: Anthropology 146, 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.

M230A-230B. Folk Tradition in Italian Literature.

(Same as Italian M230A-230B.) Mr. Speroni

M241. Folklore and Mythology of the Near East.

(Same as Near Eastern Languages M241.)

M243A. The Ballad.

(Same as English M243A.) Prerequisite: consent of the instructor. A study of the English and Scottish popular ballads and their American derivatives, with some attention to European analogues.
Mr. Wilgus

M243B. Problems in Ballad Scholarship.

(Same as English M243B.) Prerequisite: M243A or consent of the instructor. Intensive investigation of a problem or problems in the study of the popular ballad.
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

M249. Hispanic Folk Literature.

(Same as Spanish and Portuguese M249.) Prerequisite: Graduate standing. An intensive study of folk literature as represented in a) ballad and poetry; b) narrative and drama; c) speech.
Mr. Carvalho-Neto, Mr. Robe

251. Seminar in Finno-Ugric Folklore and Mythology.

M258. Seminar in Anglo-American Folk Music.

(Same as Music M258.) Mr. Porter, Mr. Wilgus

259. Seminar in Folklore.

Prerequisite: Folklore 200 and consent of the instructor.
The Staff

M286A-286B-286C. Studies in Hispanic Folk Literature.

M286A. Studies in Hispanic Folk Literature—The Romancero.

(Same as Spanish M286A.)

Mr. Rodriguez-Puértolas

M286B. Studies in Hispanic Folk Literature—Narrative and Drama.

(Same as Spanish M286B.)

Mrs. Arora, Mr. Robe

M286C. Studies in Hispanic Folk Literature—Ballad, Poetry, and Speech.
(Same as Spanish M286C.)
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. Master's 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.

141. Social and Psychological Aspects of Myth and Ritual.

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. Medieval French 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.

149. Music of Tibet.

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.

Theater Arts 117A–117B–117C. The Puppet Theater.

Spanish 151. Folk Song in Spain and Spanish America.

Graduate Courses

Anthropology 202. Ethnology.

203. Cultures of Asia.

204. Pacific Island Cultures.

205. North American Indians.

207. Indians of South America.

208. African Cultures.

253. Selected Topics in Cultures of Asia.

254. Selected Topics in Cultures of the Pacific Islands.

255A–255B. North American Indians.

256. Selected Topics in Arctic Cultures.

257. Indians of South America.

258. Selected Topics in African Cultures.

260. Selected Topics in African Arts.

261. Selected Topics in Ethnology.

294A–294B–294C. Documentary Film.

295. Seminar in Visual Anthropology.

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.

M245A. Germanic Religions and Mythology.

245B. Germanic Antiquities.

262. Seminar in Germanic Folklore.

Indo-European Studies 260A–260B. Seminar in Indo-European Mythology.

Italian 214E. *The Decameron*.

217B. Commedia dell'arte and the Theatre.

218C. The Theater, Especially Metastasio, Goldoni, C. Gozzi.

Music 253. Seminar in Notation and Transcription in Ethnomusicology.

254A–254B. 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.

Czech 155A–155B. Survey of Czech Literature.

Dutch-Flemish and Afrikaans 112. Dutch, Flemish, Afrikaans Literature in Translation.

French 141–141B–141C. Masterpieces of French Literature.

142. Contemporary French Theater in Translation.

143. Modern French Thought.

144A–144I. The French Novel.

145. Topics in French Literature.

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.

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. 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*.

Milan S. La Du, Ph.D., *Professor of French*.

James R. Lawler, Docteur de l'Université de Paris, *Professor of French (Chairman of the Department)*.

Hassan el Nouty, Docteur ès Lettres, *Professor of French*.

Oreste F. Pucciani, Ph.D., *Professor of French*.

Francis J. Crowley, Ph.D., *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*.

Stephen D. Werner, Ph.D., *Associate Professor of French*.

Christiane Allais, Ph.D., *Assistant Professor of French*.

Eric Gans, Ph.D., *Assistant Professor of French*.

Laurence Morrisette, Ph.D., *Assistant Professor of French*.

Lora Weinroth, Ph.D., *Assistant Professor of French*.

Marius Ignace Biencourt, Docteur de l'Université de Paris, *Assistant Professor of French, Emeritus*.

Nicole Atlas, Ph.D., *Assistant Professor of French*.

Colette Brichant, Docteur de l'Université de Paris, *Lecturer in French*.

Bernadette Boyle, Licenciée-ès-Lettres, *Lecturer in French*.

Colette Botbol, M.A., *Associate in French*.

Jean Pierre Dens, Ph.D., *Acting Assistant Professor of French*.

Jacqueline Hamel, Licenciée-ès-Lettres, *Lecturer in French*.

Francoise Kite, M.A., *Acting Assistant Professor of French*.

Madeleine Korol, Ph.D., *Lecturer in French*.

Padoue de Martini, B.A., *Lecturer in French*.

Uchecukwu Ogike, M.A., *Acting Assistant Professor of French*.

Malsy Prévotât, Licenciée-ès-Lettres, *Lecturer in French*.

Ruth Serfaty, Licenciée-ès-Lettres, *Associate in French*.

Preparation for the Major

Required: French 1, 2, 3, 4, 5, 6 (or 7), 12A-12B, 15.

Before undertaking Upper Division work in *grammar, composition, advanced phonetics or civilization*, the student will be required to take French 1, 2, 3, 4, 5, 6 (or 7) and 15 or their equivalents. Students receiving less than a grade of B in French 6 will take French 7 (minimum grade for continuation C). The student will normally take French 15 concurrently with French 6.

Before undertaking Upper Division work in *literature*, the student will, in addition to the above courses, be required to take French 12AB, "Introduction to the Study of French Literature." The student is encouraged to take French 6 and French 15 before undertaking French 12A-12B, but concurrent enrollment in French 6, French 15 and/or French 12A and/or 12B is permitted, provided the student has obtained a grade of at least B in French 5.

The Major

Three majors are offered by the Department.

Plan A: Leading to the Bachelors of Arts in French and subsequently to the master's degree, Plan A, or to the standard elementary or secondary credential. Required: 15 full courses of upper division work, including ordinarily French 101, 102, 103; one quarter of the offerings French 132-135; 6 courses in French literature chosen from the offerings 115-120 (students interested in the 121 series may, upon consultation with the major adviser substitute one course in this series for one of the periods in the 115-120 offerings); 3 elective courses to be chosen from upper division offerings in the Department of French in language, civilization or literature, and 2 elective upper division courses in or out of the Department of French

to be chosen only upon consultation with the major adviser.

Plan B: With emphasis on literature, leading to the Bachelor of Arts and subsequently to the master's degree in French, Plan B. Required: 15 full courses of upper division work including ordinarily French 101, 102, 103; 8 courses in French literature chosen from the 115-120 offerings (students interested in the 121 series may, upon consultation with the major adviser, substitute one course in this series for one of the periods in the 115-120 offerings); 4 elective upper division courses to be chosen only upon consultation with the major adviser, either from offerings of the Department of French, from the Humanities or Social Sciences Division of the College of Letters and Science, or from the College of Fine Arts.

Plan C: French Studies: A core program in French allowing for additional individual selection of relevant courses in related fields such as the Humanities, the Social Sciences, Linguistics, etc. Required: 15 full courses of upper division work, including ordinarily French 101, 102, 103; 6 courses of French literature chosen from the offerings 115-120 (students interested in the 121 series may, upon consultation with the major adviser, substitute one course in this series for one of the periods in the 115-120 offerings); 6 upper division elective courses in the fields relevant to French Studies to be chosen in or out of the Department of French upon consultation with the major adviser, as for example, Option I: Theater, History of Art, History of Music, Philosophy and two additional electives. Other options in the fields of the Social Sciences, the Humanities, Linguistics, etc. may be formulated; all options and the specific choice of courses must be decided in consultation with the major adviser. This program does not meet the requirements for the elementary or secondary credential, nor does it normally prepare admission to the

Master's program in French at UCLA (see Plans A and B).

It is strongly advised that students who intend to pursue advanced degrees begin preparation for the language requirements at the undergraduate level. Students whose knowledge of French exceeds the preparation usually received in courses preparing for the Major and who demonstrate the requisite attainment in French 101 or 102 (please see course description below) will substitute for those courses in grammar and composition an equivalent number of upper division courses in the Department of French upon consultation with the major adviser. Especially well prepared students may exceptionally be granted permission to substitute French 104, 105 or 108 for French 103, but only upon written permission by the Chairman of the Major Advisers. All prospective French majors who are native or quasi-native speakers of French must see the Chairman of the Major Advisers before beginning upper division work in the Major.

All major students must complete a minimum of 36 units of appropriate upper division work in the Department of French for a major.

Students who fail to maintain a C average or better in all upper division work undertaken in fulfillment of their French Major 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 a major adviser before registering for upper division courses in fulfillment of the major.

Committee of Major Advisers: Mr. Gans, Chairman Fall 1971, Winter 1972; Mrs. Weinroth, Chairman Spring 1972; Mrs. Atlas; Mrs. Allais; Mr. Dens; Mr. Morrisette; Mr. Werner.

The Honors Programs in French

Majors with a 3.4 grade point average in the Department of French and a 3.25 overall grade point average will be eligible to apply for the Honors Program in French. Interested students should contact Professor Bensimon in charge of French 140 ABC 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 101, 102 or 103, or a final examination or term paper from a literature

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

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.

Departmental 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) Teaching requirement: teaching experience is a requirement for all graduate students in the Department of French, and forms a part of the requirements for a graduate degree in French. This requirement may be satisfied in one of the following ways: certain categories of previous full-time teaching experience, service as a Teaching Assistant in the

French Department, or by taking or actively auditing French 310A-310B or 370-495 (or any combination of one theory and one observation course). It is the responsibility of the student to determine his status with regard to this requirement with his adviser. (3) Course requirements: Plan A: At least 12 courses in French including 310A-310B or 370-495 which also fulfill the above mentioned requirement.

All entering graduate students will take a departmental examination to determine whether they will be required to take French 201A and/or 201B.

In addition, the student will take seven courses in literature in three out of seven fields (medieval, 16th-20th centuries, Franco-African). 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 texte* 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. The student will take nine courses in literature in three out of seven fields defined as follows: Middle Ages, 16th century, 17th century, 18th century, 19th century, 20th century, Franco-African literature. (To meet general University requirements, at least six courses must be on the graduate level; 202 is strongly recommended.)

The comprehensive examination for Plan B will consist of a written examination in three out of seven fields (medieval- Franco-African), 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) See above Teaching requirement as for the M.A. program. (2) 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 Spanish. 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. 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 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 7 fields (medieval, 16th-20th centuries, Franco-African) 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

1R. Introduction to the Reading of French.

(¾ course)

Classes will meet three times a week. This course is intended to enable students to acquire basic reading skills in French. Attention will be given at an early stage to the specialized vocabulary of particular scientific and humanistic disciplines. The Staff

2R. Intermediate Reading of French. (¾ course)

Classes will meet three times a week. This course will pursue the work begun in 1R. It will gradually introduce texts of a more specialized nature in the various disciplines. The Staff

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

3R. Advanced Reading of French. (¾ course)

Classes will meet three times a week. This course will pursue the work begun in 1R and 2R. It will be conducted in groups arranged according to field of study.

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.

The Staff

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.

Miss Hamel in charge

12A-12B. Introduction to the Study of French Literature.

Classes meet three hours weekly; two meetings will be conducted as discussion sections. Prerequisite: course 5 with grade of B; course 6 (or 7) or the equivalent. The course will deal with an introduction to literary analysis, major literary currents and problems.

Mr. Morrisette in charge

15. Theory and Correction of Diction.

Classes meet four hours weekly. Prerequisite: French 6 or consent of instructor. French pronunciation, diction, intonation in theory and practice; phonetic transcription, phonetic evolution of the modern language; remedial exercises; recordings.

Mrs. Korol-Ward in charge

Upper Division Courses

The prerequisites to all upper division courses taken in partial fulfillment of a French Major, Plans A, B, or C, are French 6 with a grade of B or better (otherwise French 7 with a grade of C or better), French 12A-12B, French 15 or their equivalents. All upper division courses except as otherwise indicated are conducted in French. Credit will ordinarily not be allowed for completing

a less advanced course after satisfactory completion of a more advanced course in grammar and/or composition. French 104, 105, 106, 107 and 108 are not necessarily sequential and may be taken out of sequence, provided the prerequisites for each course are fulfilled.

101. Grammar.

Classes meet three hours weekly. Note: A placement examination will be administered and qualified students will be advanced to French 102 or 103.
Miss Hamel in charge

102. Advanced Grammar.

Classes meet three hours weekly. Prerequisite: French 101 or the equivalent. Note: A placement examination will be administered and qualified students will be advanced to French 103.
Mrs. Brichant in charge

103. Advanced Stylistics.

Classes meet three hours weekly. Prerequisite: French 102 or the equivalent. This course is required of all majors in Plans A, B and C, as well as of all candidates for the Standard Credential in Elementary or Secondary Teaching.
Mrs. Korol-Ward in charge

104. Literary Composition.

Classes will meet once a week for two hours. Prerequisite: 103 or the consent of the instructor.
Mr. Bensimon

105. French Linguistics.

Classes will meet three hours weekly. Prerequisite: consent of the instructor.
The Staff

106. Advanced French Phonetics.

Classes meet twice weekly. Prerequisite: consent of the instructor.
Mrs. Korol-Ward in charge

107. Contemporary Spoken French.

Classes will meet three hours weekly; laboratory sessions may be added as needed. Prerequisites: course 103 or consent of the instructor. Mrs. Boyle

108. Advanced Practical Translation.

Classes will meet four hours weekly. Prerequisite: course 103 or consent of the instructor. Exercises in written and oral translation. Miss Prevotat in charge

115A-115D. Medieval French Literature.

115A. The Medieval Epic. Classes meet two hours weekly.

115B. The Medieval Romance. Classes meet two hours weekly.

115C. The Medieval Theater. Classes meet two hours weekly.

115D. Medieval Lyric Poetry. Classes meet two hours weekly.
Mr. LaDu, Mrs. Weinroth

116A-116B. The Renaissance.

116A. Rabelais and His Time. Classes meet two hours weekly.

116B. Ronsard and His Time. Classes meet two hours weekly.

116C. Montaigne and His Time. Classes meet two hours weekly.

116D. Renaissance Theater. Classes meet two hours weekly.
Mr. Bensimon and Staff

117A-117D. The Seventeenth Century.

117A. Corneille and the Baroque. Classes meet two hours weekly.

117B. The Classical Theater: Racine and His Contemporaries. Classes meet two hours weekly.

117C. Moliere and the Comedy of the XVIIIth Century. Classes meet two hours weekly.

117D. Philosophers, moralists and novelists of the XVIIIth Century. Classes meet two hours weekly.
The Staff

118A-118D. The Eighteenth Century.

118A. Comedy and Drama. Classes meet two hours weekly.

118B. Voltaire and the Encyclopedists. Classes meet two hours weekly.

118C. Diderot and Rousseau. Classes meet two hours weekly.

118D. The Novel. Classes meet two hours weekly.
Mrs. Allais, Mr. Werner

119A-119D. The Nineteenth Century.

119A. Romanticism. Classes meet two hours weekly.

119B. The Generation of 1848. Classes meet two hours weekly.

119C. Naturalism and Symbolism. Classes meet two hours weekly.

119D. The Turn of the Century. Classes meet two hours weekly.
Mr. el Nouty, Mr. Gans

120A-120D. The Twentieth Century.

120A. Gide, Proust and Their Time. Classes meet two hours weekly.

120B. Post World War I French Writers. Classes meet two hours weekly.

120C. Sartre, Camus and Their Time. Classes meet two hours weekly.

120D. Contemporary French Writers. Classes meet two hours weekly.
Mr. Lawler, Mr. Morrisette, Mr. Pucciani

121A-121D. Contemporary Literature of French Expression.

121A. Franco-African Literature. Classes meet two hours weekly.

121B. Franco-Canadian Literature. Classes meet two hours weekly.

121C. Franco-Helvetian and Franco-Belgian Literature. Classes meet two hours weekly.

121D. Franco-Caribbean Literature. Classes meet two hours weekly. Mr. el Nouty, Mr. Morrisette

122. French Folklore, Children's and Young People's Literature.

Classes meet two hours weekly Mrs. Boyle

123. French Popular Literature.

Classes meet two hours weekly. "Roman policiers," "Theatre des boulevards," "chansons-poemes," etc.
Mr. Morrisette

132. Contemporary France.

Classes meet three hours weekly. A fourth hour may be required for the viewing of films and other laboratory activities.
Mrs. Brichant

133. French Institutions from the Revolution to the Present.

Classes meet three hours weekly. A fourth hour may be required for the viewing of films and other laboratory activities.
Mrs. Brichant

134. The "Ancien Regime."

Classes meet three hours weekly. A fourth hour may be required for the viewing of films and other laboratory activities.

Mrs. Brichant

135. From Prehistoric Times to the Renaissance.

Classes meet three hours weekly. A fourth hour may be required for the viewing of films and other laboratory activities.

Mrs. Brichant

138. Cinema and Literature in Contemporary France.

Classes meet two hours weekly. Additional hours may be required for the viewing of films and other laboratory activities. Course may be taken as an elective in partial fulfillment of French Majors Plans A, B and C.

Mrs. Atlas

140A-140B-140C. Honors Course in French.

Prerequisites: Junior or senior standing in French with 3.4 grade-point average in the major, a 3.25 average and consent of the department Honors Committee.

140A. 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 meetings.

The Staff

150. Studies in Medieval Literature.

The Staff

151. Studies in Sixteenth Century Literature.

The Staff

152. Studies in Seventeenth Century Literature.

The Staff

153. Studies in Eighteenth Century Literature.

The Staff

154. Studies in Nineteenth Century Literature.

The Staff

155. Studies in Twentieth Century Literature.

The Staff

156. Studies in Contemporary Literature of French Expression.

The Staff

157. Studies in French Language.

The Staff

199. Special Studies in French. (½ to 2 courses)

Prerequisite: Junior or Senior Standing, consent of the instructor and consultation with Chairman of major advisers. Course may be taken twice.

Department Chairman in charge

The following courses may not be taken for major or graduate credit unless otherwise indicated.

141A-141B-141C. Masterpieces of French Literature.

Classes meet three hours weekly. All texts will be read in the original. Classroom discussion, papers and examinations will be conducted in English.

The Staff

142. Contemporary French Theater in Translation.

Classes meet two hours weekly. Mrs. Korol-Ward

143. Modern French Thought.

Classes meet two hours weekly. Contemporary works will be read and discussed in translation. Course may be taken as an elective in partial fulfillment of French Major Plan C.

Mr. Gans

144A-144I. The French Novel.

Classes meet two hours weekly. Authors to be studied will be announced quarterly.

The Staff

145. Topics in French Literature.

To be announced each quarter.

The Staff

Graduate Courses

Concerning conditions for admission to graduate courses, see page 155 of this bulletin.

201A-201B. Composition and Style.

201A. Thème et Version. Course meets three times weekly.

201B. La Dissertation Française. Course meets three times weekly.

202. Explication de Textes.

(Formerly numbered 230.) Course meets twice weekly.

203A-203B-203C. French Literary Criticism.

(Formerly numbered 231.)

203A. Topics in Literary Criticism from Aristotle to Sainte-Beuve. Course meets twice weekly.

203B. Modern Theories of Criticism. Course meets twice weekly.

203C. The Techniques of Literary Criticism. Course meets twice weekly.

Mr. Gans

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.

205B. Rationalism, Empiricism, Positivism.

205C. Idealism, Phenomenology, Existentialism.

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. Phonology and morphology of the language. Introduction to Old French texts.

Mr. La Du, Ms., 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. Topics in early sixteenth century French literature. Two hours weekly. Mr. Bensimon

216B. Topics in the Pleiade. Two hours weekly. Mr. Bensimon

216C. Topics in late sixteenth century French literature. Two hours weekly. Mr. Bensimon

216D. Ronsard. Two hours weekly. Mr. Bensimon

216E. Rabelais and Prose Writers. Two hours weekly. Mr. Bensimon

216F. Baroque Poetry. Two hours weekly. Mr. Bensimon

216G. Montaigne. Two hours weekly. Mr. Bensimon

216H. Theater. Two hours weekly. Mr. Bensimon

217A-217I. The Seventeenth Century.

217A. Topics in Classical Theater. Two hours weekly.

217B. Topics in Non-Dramatic Literary Genres. Two hours weekly.

217C. Topics in Classical Prose and Thought. Two hours weekly.

217D. Molière. Two hours weekly.

217E. Corneille. Two hours weekly.

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. Topics in Classical Theater. Two hours weekly. Mr. Werner

218B. Topics in the Enlightenment. Two hours weekly. Mr. Werner

218C. Topics in the Late Enlightenment. Two hours weekly. Mr. Werner

218D. The Theater and the Novel. Two hours weekly. Mr. Werner

219A-219K. The Nineteenth Century.

219A. Topics in Romanticism. Two hour weekly. Core course. Mr. el Nouty and the Staff

219B. Topics in Realism and Naturalism. Two hours weekly.

219C. Topics in Symbolism. Two hours weekly.

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. Selected topics. Two hours weekly. The Staff

220B. From Surrealism to Existentialism. Selected topics. Two hours weekly. The Staff

220C. From Existentialism to the Present. Selected topics. Two hours weekly. The Staff

220D. Paul Valéry. Two hours weekly. The Staff

220E. Marcel Proust. Two hours weekly. The Staff

220F. André Gide. Two hours weekly. The Staff

220G. André Malraux. Two hours weekly. The Staff

220H. The Theater. Two hours weekly. The Staff

220I. The Anti-Theater. Two hours weekly. The Staff

220J. The Novel. Two hours weekly. The Staff

220K. The Anti-Novel. Two hours weekly. The Staff

220L. Surrealism. Two hours weekly. The Staff

220M. Existentialism. Two hours weekly. The Staff

220O. Poetry. Two hours weekly. The Staff

220P. Cinema and Literature. Two hours weekly. The Staff

221A-221D. French-African Literature. Mr. el Nouty

221A. Introduction to the Study of the French-African Literatures. Two hours weekly.

221B. French-African Literature of Madagascar and Bantu Africa. Two hours weekly.

221C. French-African Literature of Berbero-Sudanese and Arabo-Islamic Africa. Two hours weekly.

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

310 / FRENCH; GENETICS; GEOCHEMISTRY

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.

A particular problem of French literature and ideas.
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-101B-101C. 102, 103. Observation of Language Teaching in the Secondary School and at the College Level.
The Staff

■ GENETICS

For courses in genetics, see under departments of Bacteriology and Biology.

■ GEOCHEMISTRY (INTERDEPARTMENTAL)

Interdepartmental Committee for Graduate Study in Geochemistry. O. L. Anderson, Geophysics and Planetary and Space Science; K. D. Bayes, Chemistry; W. C. Ernst, Geology and Geophysics; I. R. Kaplan, Geology and Geophysics; G. C. Kennedy, Geophysics and Geology; H. H. Kieffer, Planetary and Space Science; W. F. Libby, Chemistry and Geophysics; W. W. Rubey, Geology and Geophysics; J. W. Schopf, Geology and Geophysics; 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 Geochem-

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

598. 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

istry 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 examinations 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.*
 Gary S. Dunbar, 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.*
 Jonathan D. Sauer, Ph.D., *Professor of Geography.*
 Joseph E. Spencer, Ph.D., *Professor of Geography.*
 Benjamin E. Thomas, Ph.D., *Professor of Geography (Chairman of the Department).*
 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.*
 Clifford M. Zierer, Ph.D., *Emeritus Professor of Geography.*
 William A. V. Clark, Ph.D., *Associate Professor of Geography.*
 Gerry A. Hale, Ph.D., *Associate Professor of Geography.*
 Antony R. Orme, Ph.D., *Associate Professor of Geography.*
 Werner H. Terjung, Ph.D., *Associate Professor of Geography.*
 Philip M. Lankford, Ph.D., *Assistant Professor of Geography.*
 Christopher Salter, Ph.D., *Assistant Professor of Geography.*



Howard W. Mielke, M.A., *Acting Assistant Professor of Geography.*
 Hartmut Walter, Ph.D., *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 creden-

tial 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 (or nine upper division courses and Geography 2A, B or C) chosen in consultation with a departmental adviser. Each major must take three courses from a field of concentration: Group I—Physical/Biotic; Group II—Cultural/Historical; or Group III—Locational/Economic/Urban. In addition, each major must take one course from each of the other two Groups, I, II, or III, not chosen as a field of concentration, one course from Group IV—Procedural, one course from Group V—Regional, plus three elective upper division courses in geography.

Allied Fields. Every geography major shall develop some competence in one or two allied fields. This program, which must be approved by the departmental adviser, 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 sequence allied to the field of concentration within the major.

All courses that are required for the undergraduate major in Geography must be taken for credit. This includes all Lower and Upper Division courses in Geography, and all four Upper Division courses in the Allied Fields.

The Major in Analysis and Conservation of Ecosystems

The Department of Geography offers an alternative major, Analysis and Conservation of Ecosystems. The major is divided into two plans. *Plan 1* is designed principally for students desiring a general education focused on gaining an understanding of problems and issues related to past, present and future human manipulation and utilization of the world's ecosystems and to those students who wish to lay the foundation for educational contributions to non-academic society via the principal communicative media. This plan is also suitable for graduate preparation. *Plan 2* is designed principally for students who wish to pursue future work at the graduate level and beyond the various aspects of the analysis and conservation of ecosystems. Like *Plan 1*, this is a deliberately broad major but is more rigorous in terms of the mathematics demanded. It should be noted that the mathematical requirements for *Plan 2* should be considered as being minimal and it is expected that preliminary familiarity with a computer language, e.g., FORTRAN, will be gained by the student on her/his own volition prior to completion of the senior year.

Students electing to follow *Plan 2* must complete, prior to the senior year, study in one modern foreign language to the extent that an adequate level of reading comprehension of materials in the social sciences-ecology-humanities areas has been gained. The student may use whatever procedure she/he deems most useful to fulfill this requirement.

All students will be required to write a substantial Senior Paper which will be presented at a prescribed time prior to date of graduation. All students must work in close and frequent consultation with a faculty adviser. A principal feature of this major is that a high degree of emphasis is placed upon student input—particularly in respect to seminars—

and it is therefore mandatory that close liaison be maintained between all involved persons.

Plan 1

Preparation Required. Biology 2; Geography 1A, 1B, 5; and strongly recommended Geography 25 and History 2A–2B.

Major Requirements. Economics 100; Geography 100, 120, 121, 123, 124, 136; in addition, an upper division course in Philosophy similar to Philosophy 150A or B, and in Psychology similar to Psychology 149. Discussions are under way with the Chairmen of these departments which should lead to the identification or creation of appropriate courses.

Electives. Nine courses chosen from the following list with the assistance of a faculty adviser: Anthropology 123A–123B, 140, 153, 160; Economics 108, 110; Geography 100, 114, 116, 130, 150; History 102A–102B, 106B–106C; Journalism 182A–182B; Political Science 141, 142, 184, 192; Public Health 117, 160A–160B–160C–16D, 161; Sociology 125, 126; Speech 101, 106, 107.

Plan 2

Preparation Required. Biology 1A–1B; Geography 1A, 1B, 5; Mathematics 3A–3B–3C, 13A–13B–13C; and strongly recommended Geography 25 and History 2A–2B.

Major Requirements. Biology 120; Geography 100, 120, 121, 123, 125, 136; Mathematics 152A–152B.

Electives. Nine courses chosen from the following list with the assistance of a faculty adviser: Anthropology 153, 160; Economics 100, 108; Engineering 184A; Geography 102, 104, 110, 116, 150; History 102A–102B, 106C; Journalism 183; Philosophy 150A–150B, 151, 188; Political Science 141, 142; Psychology 149; Public Health 161; Sociology 126; Biology 124, 126.

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 a high grade-point average in 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 instruc-

tors. Students not meeting the grade average requirements 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.

Every student will be given a Diagnostic Examination early in the first quarter of residence to assess his general competence in the field of geography and to provide guidance in the planning of his graduate program.

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 147-149, 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.

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 or a research tool such as statistics or mathematics 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. Selection of a thesis topic, conduct of the investigation, and final organization, proceeds initially under the supervision of an informal guidance committee and, later, under an official Graduate Division committee.

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.

All formal course work, including the passage of the foreign language, must be completed before the examination and research paper are attempted.

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 pages 147-149, 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.

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: Locational Analysis.

Lecture, one hour; laboratory-discussion, three hours. Prerequisites: courses 1A, 1B, or equivalent, or consent of the instructor. Basic location theory, introduction to central place theory, and elementary models of spatial interaction. Specific methods of analysis are studied as they relate to theory. Introduction to computer techniques in analysis.

Mr. Lankford

2A. Problems in Physical Geography.

Staff-student discussion, three hours; reading period, one hour. Prerequisites: Geography 1A; open to lower division majors, undeclared majors and other lower division students as space allows. Class enrollment limited to fifteen students. A seminar type course in which students carry on an intensive research project on problems in physical geography, write a paper and present it to the class. The Staff

2B. Problems in Cultural Geography.

Staff-student discussion, three hours; reading period, one hour. Prerequisites: Geography 1B; open to lower division majors, undeclared majors and other lower division students as space allows. Class enrollment limited to fifteen students. A seminar type course in which students carry on an intensive research project on problems in cultural geography, write a paper and present it to the class. The Staff

2C. Problems in Locational Analysis.

Staff-student discussion, three hours; reading period, one hour. Prerequisites: Geography 1C; open to lower division majors, undeclared majors and other lower division students as space allows. Class enrollment limited to fifteen students. A seminar type course in which students carry on an intensive research project on problems in locational analysis, write a paper and present it to the class. 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, Mr. Mielke, Mr. Walter

25. Proseminar in Selected Topics Relating to Man-Land Relationships.

Lecture and discussion, four hours; reading period, two hours. Prerequisite: Sophomore standing and consent of the instructor. An exploration of the fundamental concepts of ecology and human geography as they relate to the conservation and analysis of ecosystems exploited by man. Limited to 20 students.

Mr. Bennett

Upper Division Courses

GROUP I. PHYSICAL/BIOTIC

100. Environmental Systems.

(Formerly numbered 110.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, or equivalent, or consent of instructor. An analysis of the energy and materials involved in environmental systems, relating the state of such systems to interdependent physical and biotic variables, and to disruptive human influences.

Mr. Orme

102. Geomorphology.

(Formerly numbered 112.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent; or junior standing or consent of 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

104. Climatology.

(Formerly numbered 114.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A,

1B, 1C or equivalent, Meteorology 4A, 4B, or meteorology special science course; 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

108. Soils.

(Formerly numbered 116.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent, or junior standing; and Chemistry 1A or 2A, or consent of instructor. A study of the origins, evolution, properties and utilization of soils, with special emphasis on the world's major soil groups.

The Staff

110. Plant Geography.

(Formerly numbered 160.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent, or consent of instructor. Characteristics, distribution, environmental and cultural relationships of the principal vegetation patterns.

Mr. Sauer

112. Plant Migration.

(Formerly numbered 166.) 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

114. Historical Geography of Crop Plants.

(Formerly numbered 164.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, and Biology 2, or equivalent, 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

116. Animal Geography.

(Formerly numbered 162.) 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 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

120. Conservation of Resources: North America.

(Formerly numbered 134A.) 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

121. Conservation of Resources: Underdeveloped World.

(Formerly numbered 134B.) 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

123. The World's Ecosystems: Problems and Issues.

Lecture, three hours; discussion session, one hour. Prerequisite: courses 100, 120, or 121. Principal objectives are (1) to identify past, current, and

projected problems associated with human-induced ecological disturbances and (2) to identify and evaluate the societal and biophysical factors which have contributed to the identified ecological disequilibria.

The Staff

124. Seminar in the Analysis and Conservation of Ecosystems.

Discussion session, three hours; reading period, two hours. Prerequisites: Senior standing; Geography 100, 120, 121, 123; Public Health 181A is highly recommended. Qualitative analysis of problems associated with the protection and ecologically oriented utilization of urban and non-urban ecosystems.

Mr. Bennett

125. Seminar in the Conservation and Analysis of Ecosystems.

Discussion session, three hours; reading period, two hours. Prerequisites: Senior standing; Geography 100, 120 or 121, 123; Mathematics 151A (or the equivalent); Biology 120. Quantitative-qualitative analysis of problems associated with rational protection and use of urban and non-urban ecosystems.

The Staff

M127. Soil-Plant Relations.

(Same as Biology M127.) Prerequisite: Biology 1A-1B, or the equivalent, or consent of instructor. A general treatment of soil development and morphology, its physical and chemical properties as they relate to plant growth; soil resources, management and conservation. Laboratory consists of field trip, map study, problem solving, reporting on library research projects.

The Staff

129. Problems in Physical/Biotic Geography.

Staff-student discussions, three hours; reading period, one hour. Prerequisite: two courses from Group I, Senior standing. Class enrollment limited to fifteen students. A seminar type course in which students carry on intensive research projects. Designed as a "capstone" to courses in this group, the subjects of research will grow out of the previous work.

The Staff

GROUP II. CULTURAL/HISTORICAL

130. Cultural Bases of Geography.

(Formerly numbered 120.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1B, or equivalent. Geographical analysis of cultural factors in the evolution of primitive cultures and advanced civilizations. Emphasis upon selected economic, political, and social aspects of man's occupation of the earth's surface.

The Staff

136. Population and Settlement.

(Formerly numbered 122.) 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

140. Political Geography.

Lecture, three hours; reading period, one hour. Prerequisites: 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. Kostanick

144. Historical Geography of the United States.

(Formerly numbered 124.) Lecture, three hours; reading period, one hour. Prerequisites: 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

149. Problems in Cultural/Historical Geography.

Staff-student discussions, three hours; reading period, one hour. Prerequisites: two courses from Group II, Senior standing. Class enrollment limited to fifteen students. A seminar type course in which students carry on intensive research projects. Designed as a "capstone" to courses in this group, the subjects of research will grow out of the previous work. The Staff

GROUP III. LOCATIONAL/ECONOMIC/URBAN**150. Urban Geography.**

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent, or upper division standing. An analysis of the development, functions, spatial patterns and geographic problems of American Cities. Mr. Clark, Mr. Nelson

153. Urban Systems.

Lecture, three hours; reading period, one hour. Prerequisite: Geography 177 or consent of instructor. Analysis of systems of cities including central place theory, rank size rule, economic base studies, urban size "ratchet," the role of innovation, and the spatial dynamics of the growth of the urban system, with particular focus on the U. S.

Mr. Clark, Mr. Lankford

154. Urban Structure.

Lecture, three hours; reading period, one hour. Prerequisite: Geography 177 or consent of instructor. An analysis of the internal structure of the city using location theory and urban land use theory.

Mr. Clark, Mr. Lankford

160. Economic Production Systems.

(Formerly numbered 130.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent, or upper division standing. An analysis of those principal economic production systems especially involved with agriculture, foodstuffs, resources and industrialization in the underdeveloped world.

Mr. MacFadden

162. Industry and Resources.

(Formerly numbered 132.) Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, or equivalent, or upper division standing. An analysis of the character and regionalization of industrial and resource developments within the developed and developing countries of the world.

Mr. MacFadden

163. Location and Space Economy.

(Formerly numbered 135.) Lecture, three hours; reading period, one hour. Prerequisite: Geography 177 or consent of instructor. Study of location and the space economy. Design and methods of economic regionalization. Location theory. Inter-regional trade and growth models. Introduction to regional information systems.

Mr. Lankford

169. Problems in Locational/Economic/Urban Geography.

Staff-student discussions, three hours; reading period, one hour. Prerequisites: two courses from

Group III, Senior standing. Class enrollment is limited to fifteen students. A seminar type course in which students carry on intensive research projects. Designed as a "capstone" to courses in this group, the subjects of research will grow out of the previous work.

The Staff

GROUP IV. PROCEDURAL**170. Field Analysis.**

Saturday field trips, 8-5. Prerequisites: courses 1A, 1B, 1C, 100, 130, or equivalent, and consent of 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

171. Map Analysis.

Lecture, three hours; reading period, one hour. Prerequisite: courses 1A, 1B or equivalent, or upper division standing. The analysis of maps, with the aim of deducing the physical, cultural and economic aspects of the region portrayed, including such elements as geomorphic history, hydrography, settlement pattern and settlement history, forms of economic livelihood, transportation problems and toponomy.

Mr. Logan

172. Cartography.

Laboratory, four hours; independent work, two hours. Prerequisites: courses 1A, 1B, or equivalent, or 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

174. Regional Analysis.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A, 1B, 1C, or consent of instructor. An introduction to the philosophy, concepts and methods of the regional approach in geography.

Mr. Hale

176. Quantitative Analysis.

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

177. Spatial Statistics.

Lecture, three hours; reading period, one hour. Prerequisites: Mathematics 50 or Geography 176 or consent of instructor. Specific techniques useful in the analysis of spatial distributions, including both point and areal patterns; and emphasizing spatial descriptive statistics, probability models of spatial distributions, and monte-carlo simulation of spatial distributions.

Mr. Clark

GROUP V. REGIONAL**180. Anglo-America.**

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.

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

182A. Spanish South America.

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 Spanish South America and of the contemporary economic and cultural geography of the individual Spanish-speaking countries.

Mr. Bruman

182B. Brazil.

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 Portuguese South America and of the contemporary economic and cultural geography of Brazil.

Mr. Bruman

183. Europe.

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. Kostanick, Mr. Thrower

184. Soviet Union.

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. Kostanick

185. Southern Asia.

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.

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.

Lecture, three hours; reading period, one hour. Prerequisites: courses 1A-1B, or equivalent, or upper division standing. An analysis of the economic, social, and political geography of the area extending from Iran to Morocco and from Turkey to Sudan. Emphasis on geographical themes and problems during historical 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. An analysis of the economic, social, and political geography of the area including Mediterranean Africa, the Sahara, the Sudanic belt, and the eastern Horn. Emphasis on geographical

themes and problems during historical and modern times.

Mr. Hale, Mr. Thomas

189. Middle and Southern Africa.

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.

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.

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

UNGROUPED

197. Proseminar in Geography.

(Formerly numbered 198.) Staff-student discussions, three hours; reading period, one hour. Prerequisites: courses 100 and 130 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: Senior standing and consent of 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

201. Introduction to Bibliographical Research in Geography.

Lecture, 1 hour; discussion session, 2 hours; reading period, 1 hour. Prerequisite: consent of the instructor. A survey of the literature of geography, with special reference to periodicals. Intended for beginning graduate students.

Mr. Dunbar

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 land-forms. 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 104, 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 230 or 232, 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

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. Prerequisites: 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 evaluation 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 computers' 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

M276. Advanced Quantitative Analysis.

(Same as Architecture and Urban Planning M232.) 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. Emphasis on linear models, factor analysis and grouping procedures as applied to geographic data bases. Mr. Clark

278A-278B-278C. 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. May be repeated for credit. 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. May be repeated for credit. 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. May be repeated for credit. Mr. Orme

279. Model Building for Spatial Analysis.

Discussion session, three hours. Prerequisite: course M276. Discussions of the philosophy and methodology of model building. The focus will be on the problems unique to models of spatial structure. Individual research topics will be emphasized. Mr. Clark

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. Salter, 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. Salter, 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 (Chairman of the Department).***

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.***

N. Gary Lane, Ph.D., *Professor of Geology.*

Helen Tappan Loeblich, Ph.D., *Professor of Geology.*

Clemens A. Nelson, Ph.D., *Professor of Geology.*

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 (Vice-Chairman of the Department).*

****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.***

Wayne A. Dollase, Ph.D., *Associate Professor of Geology.*

J. William Schopf, Ph.D., *Associate Professor of Geology.*

Douglas Rumble, Ph.D., *Assistant Professor of Geology.*



****Orson L. Anderson, Ph.D., *Professor of Geophysics.***

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 and Environmental Geology.*

Everett C. Olson, Ph.D., *Professor of Zoology.*

Louella R. Saul, M.A., *Senior Museum Scientist.*

Takeo Susuki, M.A., *Senior Museum Scientist.*

**** Member of the Institute of Geophysics and Planetary Physics.**

Peter P. Vaughn, Ph.D., *Professor of Zoology.*

******John Wasson, Ph.D., *Associate Professor of Chemistry and Geophysics.*

David Weide, M.A., *Museum Scientist.*

Edward C. Wilson, Ph.D., *Research Associate in Geology.*

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 M1, 2, 51A, 51B, 51C; Biology 1A-1B or 181A-182B; Chemistry 1A-1B-1C; Mathematics 3A-3B-3C or 11A-11B-11C; Physics 6A-6B-6C or 7A-7B and 7C or 7D; four additional courses from other fields with approval by the Undergraduate Adviser.

The Major

Geology 111A-111B-111C, 112, 115, 121A-121B, 190; two additional upper division courses in geology, other than 100 or 199.

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.

Honors in Geology

The honors program in Geology is intended to provide exceptional students an opportunity for advanced research and study under the tutorial guidance of a member of the faculty. Requirements for admission to candidacy are the same as those required for admission to the Honors Program of the College of Letters and Science. Qualified students wishing to enter the program must submit a completed application form to the Departmental Honors Committee near the end of their junior year. Honors in Geology are awarded upon graduation to those students who have a cumulative gpa of 3.25, who have completed at least 20 graded courses in

the University of California, and who have completed a minimum of two quarters (8 units) of course 199H leading to the preparation of a satisfactory honors thesis. Students demonstrating exceptional ability will be awarded Highest Honors.

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 147-149.

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 151.

Students may proceed directly from the B.A. or B.S. degree toward the Ph.D. degree

****** Member of the Institute of Geophysics and Planetary Physics.

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 Examination, 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.

Foreign languages are not a specific requirement for the Ph.D. degree. Each student's guidance committee will determine: (a) whether or not there will be foreign language requirements for their advisee, (b) what the requirements, if any, will be, (c) how the requirements, if any, may be fulfilled.

Lower Division Courses

M1. Fundamentals of Earth Science.

(Same as Physical Science M3G.) Lecture, three hours; laboratory, two hours. Prerequisite: none. Freshman seminar option—Field seminar (2 days) or class seminar (eight one-hour sessions); limited enrollment (15 students per section). 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 M1 or Physical Sciences M3G. 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. Mrs. Loeblich

10. Geology of California.

Lecture, three hours; field excursions—four Saturdays. General survey of major geologic features and geologic history of California; its relationship to large scale crustal motions of western North America and the eastern Pacific. Environmental geology; study of geologic hazards such as earthquakes, landslides; aspects of urban geology.

Mr. Nelson

51A. Mineralogy-Petrology.

Lecture, three hours; laboratory, six hours. Prerequisites: Geology 1, Chemistry 1C or consent of

instructor. Mineralogic crystal chemistry; relation of physical properties to structure. Structural classification and petrogenesis of the main rock-forming minerals. Laboratory study of crystallography and identification of minerals in igneous, sedimentary and metamorphic rocks.

Mr. Dollase

51B. Mineralogy-Petrology.

Lecture, three hours; laboratory, six hours. Prerequisites: Geology 51A and an introductory course in high school or college physics or the consent of the instructor. Principles of optical crystallography. Utilization of optical properties to identify non-opaque minerals in immersion media and in thin section. Sufficient theory is presented to understand the operations performed in the laboratory.

Mr. Rosenfeld

51C. Mineralogy-Petrology.

Lecture, three hours; laboratory, six hours. Prerequisite: Geology 51B. Composition, occurrence, and origin of igneous, sedimentary, and metamorphic rocks; megascopic and microscopic study of rocks.

Mr. Watson

Upper Division Courses

100. Principles of Earth Science.

Lecture, three hours. Designed for non-majors. Fundamentals of physical geology and earth history; major problems of geology, such as continental drift and development of large scale features of the earth; physical and biological evolution. Not open to students who have taken Geology M1.

The Staff

103. Intermediate Petrology.

Lecture, two hours; laboratory, six hours. Prerequisite: course 51C. Microscopic and megascopic study of selected suites of igneous, sedimentary, and metamorphic rocks; their composition, occurrence, and origin.

Mr. Watson

111A-111B-111C. Stratigraphic-Structural-Field Geology.

Lecture, three hours; laboratory, three hours (alternate weeks); field, average of one day per week. Prerequisites: courses 2 and 51C, or consent of instructor. Principles of geologic mapping, stratigraphy, elementary structural geology, interpretation of geologic maps and aerial photographs, report writing.

The Staff

112. Structural Geology.

Lecture, three hours; laboratory, three hours. Prerequisite: course 111B (must be taken concurrently), or consent of instructor. Planar and linear structures at different scales in sedimentary, metamorphic, and igneous rocks. Faults and folds, their description, classification, and dynamic analysis. Deformation, strength, fracture, and rheological properties of rocks.

Mr. Christie, Mr. Oertel

114. Intermediate Structural Geology.

Lecture, two hours; laboratory, three hours; field trips. Prerequisite: course 112 or consent of instructor. Large scale tectonics. The major structural features of the continental and oceanic crust of the earth; their geometry, geological and geophysical characteristics and theories as to their mode of origin. Orogenesis, continental drift, sea-floor spreading and plate tectonics. Methods of structural analysis and interpretation of geological structures.

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

116. Intermediate Paleontology.

Lecture, two hours; laboratory, six hours; field trips. Prerequisite: course 115, or advanced standing in biological sciences, or consent of the instructor. Lectures will emphasize evolutionary, ecological, stratigraphic, and taxonomic aspects of fossil invertebrates. Field work and laboratory will be devoted to a research project and written report. Mr. Hall, Mr. Lane, Mrs. Loeblich

M117. Vertebrate Paleontology.

(Same as Biology M117.) Lecture three hours; laboratory, three hours. Prerequisite: Biology 110. Recommended: a course in general geology. Limited enrollment. Study of the fossil record of the evolution of the vertebrates. Mr. Vaughn

M118. Paleobotany.

Formerly numbered 218 (Same as Biology M118). 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 51C. Origin and occurrence of important metallic and non-metallic deposits. (Alternates yearly with course 138.) Mr. Carlisle, Mr. Watson

M130. Isotope Geochemistry.

(Same as Geophysics M130.) 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

M131. Geochemistry.

(Same as Geophysics M131 and Planetary and Space Science M131.) 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 in

the earth, oceans, and atmosphere; chemistry of the earth's interior, phase transformations at high pressure and temperature. (Alternates yearly with Geology and Geophysics M130.)

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

M134. Mineral Physics and Equation of State.

(Same as Planetary and Space Science 134.) Lecture, three hours. Prerequisite: consent of instructor, upper division standing. Interrelationship of the physical properties of rock-forming minerals: optical reflectivity, refraction index, sound velocity, elastic constants, specific heat, and thermal expansivity. Determination of pressure, volume, and temperature relationships in planet-forming compounds. Variation of elastic constants with temperature and pressure. Application of shock-wave experiments to equations of state. Mr. Anderson

M136. Geophysical Exploration.

(Same as Geophysics M136 and Planetary and Space Science M136.) 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 51C. 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 and Environmental 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

* Not to be given, 1972-1973.

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.

The Staff

190. Geology Seminar. (½ course)

Discussion and lecture, 2 hours. Prerequisite: Junior or senior standing. Limited to undergraduate students. Current topics of geologic research. To be given on pass/not pass basis. May be repeated more than once for credit.

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

199H. Honors Research in Geology.

Prerequisites: Senior standing and permission of the departmental honors committee. Individual research designed to broaden and deepen the student's knowledge of some phase of geology.

The Staff

Graduate Courses

*200. Geology Colloquium. (½ course)

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 phases: (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

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

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 coccolithophorids. (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 51C. 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 51C. 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 51C, Chemistry 113 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).

Mr. Rumble

*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 pleochroic refringent haloes, Rayleigh depletion model, isotopic fractionation, environmental factors of metamorphism. Labo-

* Not to be given, 1972-1973.

ratory study of representative metamorphic rocks and suites of rocks selected to illustrate topics discussed in lectures. Mr. Rosenfeld, Mr. Rumble

*239. Structural Petrology of Deformed Rocks.

Lecture and discussion, three hours; laboratory, three hours. Prerequisite: courses 51C, 111; 114 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.) The Staff

241. Sedimentary Petrology.

Lecture, two hours; laboratory, six hours. Prerequisite: course 51C, recommended course 240. Texture, composition, structure, and modes of origin of the sedimentary rocks. (Alternates yearly with course 240.) The Staff

*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,

* Not to be given, 1972-1973.

three hours. Prerequisite: courses 111; 114 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.
(½ to 1 course)**298. Advanced Topics in Geology.** (½ to 1 course)

Individual Study and Research
Mr. Rubey

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

Related Courses in Other Departments

Biology 262. Seminar in Vertebrate Paleontology.**Geophysics and Planetary Physics.**

250. Seminar in Geophysics.

280. Experimental Geology.

Planetary and Space Science 200A. Fundamentals of Planetary and Space Physics 1: The Solid Earth.**200B. Fundamentals of Planetary and Space Physics 2: The Earth's Ocean and Atmosphere.****■ GEOPHYSICS AND PLANETARY PHYSICS**

(Institute Office, 3687 Geology Building)

Orson L. Anderson, Ph.D., *Professor of Geophysics.*

Paul J. Coleman, Jr., Ph.D., *Professor of Planetary Physics.*

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.*

Richard Lingenfelter, B.A., *Professor of Geophysics and Planetary Physics in Residence.*

Clarence E. Palmer, D.Sc., *Professor of Geophysics.*

Zdenek Sekera, Ph.D., *Professor of Meteorology and 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 Barcilon, Ph.D., *Associate Professor of Mathematics and Geophysics.*

C. Rainer Berger, Ph.D., *Associate Professor of History and Geophysics.*

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

§ Recalled to active service, 1972-1973.

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 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 80.

Upper Division Courses

M130. Isotope Geochemistry.

(Same as Geology M130.) 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 poliothermometers, hydrology, mineral formation and origin of biological deposits. (Alternates yearly with course 131.) Mr. Kaplan, Mr. Libby

M131. Geochemistry.

(Same as Geology and Planetary and Space Science M131.) Lecture, three hours; discussion, one hour. Prerequisites: junior or senior standing in chemistry, physics, or geology, or consent of instructor. Origin and abundance 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 Geology and Geophysics course M130.)

Mr. Kennedy, Mr. Wasson, Mr. Wetherill Kaplan).

M136. Geophysical Exploration.

(Same as Geology M136 and Planetary and Space Science M136.) 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

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. (¾ 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)

Prerequisite: consent of the instructor. Directed individual study or research in: theoretical and experimental studies relative to seismology and geophysics of the earth's interior (Mr. Knopoff); gravity and earthtides (Mr. Slichter); tectonophysics and properties of matter at high pressure (Mr. Griggs); space-plasma physics (Mr. Holzer); cosmic ray physics and lunar and martian surface studies (Mr. Lingenfelter); mineral physics, elastic properties and shear instabilities of rocks and rock-forming materials (Mr. Anderson); volcanology, physics of high pressure, phase equilibria in geologically important chemical systems (Mr. Kennedy); meteorological problems (Mr. Palmer); radioactive dating and nuclear geophysics (Mr. Libby, Mr. Wetherill); meteorites (Mr. Wetherill); 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.

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)

†Ehrhard Bahr, Ph.D., *Professor of German.*
Franz H. Bäuml, Ph.D., *Professor of German (Chairman of the Department).*
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 and Germanic Languages.*
Gustave Otto Arlt, Ph.D., LL.D., *Emeritus Professor of German.*
Carl William Hagge, Ph.D., *Emeritus Professor of German.*
William J. Mulloy, Ph.D., *Emeritus Professor of German.*
†Wolfgang Nehring, Ph.D., *Associate Professor of German.*
Vern W. Robinson, Ph.D., *Associate Professor of German.*
Donald J. Ward, Ph.D., *Associate Professor of German.*
Terrence Wilbur, Ph.D., *Associate Professor of German.*
Arthur B. Groos, Jr., Ph.D., *Assistant Professor of German.*
E. Bond Johnson III, Ph.D., *Assistant Professor of German.*
Alfred Karnein, Ph.D., *Assistant Professor of German.*
David R. McCann, Ph.D., *Assistant Professor of German.*
Peter Schmidt, Ph.D., *Assistant Professor of German.*
Hans Wagener, Ph.D., *Assistant Professor of German.*



†Marianna D. Birnbaum, Ph.D., *Lecturer in Hungarian.*
Stephanie Lombardi, Ph.D., *Lecturer in German.*

SCANDINAVIAN LANGUAGES

Kenneth G. Chapman, Ph.D., *Professor of Scandinavian Languages (Vice Chairman of the Department).*
†Erik Wahlgren, Ph.D., *Professor of Scandinavian and Germanic Languages.*
Ross P. Shideler, Ph.D., *Assistant Professor of Scandinavian and Comparative Literature.*



James R. Massengale, M.A., *Acting Assistant Professor of Scandinavian Languages.*
Inkeri A. Rank, M.A., M.Ed., *Lecturer in Finnish Studies.*

† Absent on leave, 1972-1973.

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 121E, 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 121E, 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 appropriate 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 147-149.

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 pages 150-151), 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 151-154.

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 16th 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 151. 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. Mr. Schmidt in charge

16. Elementary German for Graduate Students.

(No credit)

Lecture, five hours per week. To provide preparation for Graduate Division foreign language reading requirement. Mr. Schmidt in charge

2. Elementary German.

Lecture, five hours per week; laboratory, one hour. Prerequisite: course 1. Mr. Schmidt in charge

26. Elementary German for Graduate Students.

(No credit)

Continuation of course 1G. Mr. Schmidt in charge

3. Elementary German.

Lecture, five hours per week. Prerequisite: course 2 or two years of high school German.

Mr. Schmidt in charge

4. Intermediate German.

Lecture, five hours per week. Prerequisite: course 3 or three years of high school German.

Mr. Schmidt in charge

5. Intermediate German.

Prerequisite: course 4, or four years of high school German.

Mr. Schmidt in charge

6. Intermediate German.

Prerequisite: course 5 or the equivalent.

Mr. Schmidt 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. Bäuml, Mr. Johnson, Mr. McCann

103A. Lessing.

Reading and discussion of representative works of Lessing, including *Minna von Barnheim*, *Emilia Galotti*, *Nathan der Weise*, *Die Erziehung des Menschengeschlechts*, and selections from *Laocoon* and *Hamburgische Dramaturgie*.

Mr. Bahr, Mr. Groos, Mr. Schmidt

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. Schmidt

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

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, Mr. Schmidt

108B. Advanced Composition, Grammar, and Conversation.

(Formerly numbered 106B.) Grammar, composition, conversation. Prerequisite: course 108A or consent of instructor.

Mr. Karnein, Mrs. Lombardi, Mr. Schmidt

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. Not open to majors in German for credit. Mr. Wilbur

121A. Older German Literature in Translation.

Analyses in English of works of German literature from the Medieval period to Baroque.

Mr. Bäuml, Mr. Groos, Mr. Wagener

121B. Classical German Literature in Translation.

(Formerly numbered 121A.) Analyses in English of works of the period of Classicism. Not open to majors in German for credit.

Mr. Bahr, Mr. Groos, Mr. Robinson

121C. 19th Century German Literature in Translation.

Readings and lectures in English on selected 19th century authors. Not open to majors in German for credit. Mr. Robinson

121D. Modern German Literature in Translation.

(Formerly numbered 121B.) Readings, lectures and discussions in English on selected modern authors, including Nietzsche, Mann, Kafka, Brecht, Hesse and Rilke. Not open to majors in German for credit. Mr. McCann, Mr. Oswald, Mr. Wagener

Courses Open to Graduate Students in German**121E. Special Problems in Literature.**

Prerequisite: upper division standing in any department. Varying topics of current importance and immediate relevance to literary study. The course is designed to introduce the student to contemporary trends in literary study and is predominantly concerned with topics related to German Literature and criticism. Lectures in English. The Staff

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, Mr. Wagener

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*, *Urfaut*, *Egmont*, and a wide selection of lyrics.

Mr. Bahr, Mr. Groos

123B. The Classical Goethe.

Prerequisites: courses 100, 101 and 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

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. Johnson, 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. Bahr, Mr. Johnson, Mr. Nehring

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, Mr. Schmidt

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. Bahr, Mr. Groos

134. German Folklore.

A survey of the various genres of German folklore. Mr. Hand, Mr. Ward

199A-199ZZ. 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, Mr. Karnein

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 *Eréc* and *Iwein*, Wolfram's *Parzival*, and Gottfried's *Tristan*. Lectures on the art 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. Regnart 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. Groos

206B. Sturm und Drang.

Representative authors of the *Sturm und Drang* including the young Goethe and Schiller. Mr. Bahr, Mr. Groos

207A. Classicism: Goethe.

Selected topics in the works of Goethe in the period 1776-1832. Mr. Bahr

207B. Classicism: Schiller.

Selected topics in the dramatic and critical works of Schiller in the period 1793-1805. Mr. Bahr, Mr. Groos

208. Romanticism.

Analysis of representative works of the Romantic Period. Mr. Johnson, Mr. Nehring

209A. 19th Century Lyrics.

Analysis of postromantic lyric poetry. Mr. Bahr, Mr. Johnson, Mr. Nehring

209B. 19th Century Drama.

Analyses of postromantic, prenaturalistic dramas. Mr. Bahr, Mr. Johnson, Mr. Nehring

209C. 19th Century Narrative Prose.

Analyses of works of postromantic, prenaturalistic narrative prose. Mr. Bahr, Mr. Johnson, Mr. Nehring

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. Wilbur

230. Survey of Germanic Philology.

Mr. Wilbur

231. Gothic.

Mr. Wilbur

232. Old High German.

Mr. Wilbur

233. Old Saxon.

Mr. Wilbur

240A. Theories, Methods, and History of Germanic Folklore.

Historical survey of folklore theory in the Germanic countries, and a study of modern folklore methodology, bibliography, and status of studies. 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

M245A. Germanic Religions and Mythology.

(Formerly numbered 245.) (Same as Scandinavian M245). Mr. Wahlgren

245B. Germanic Antiquities.

Prehistory and early history of Germanic culture; a philological investigation of Germanic ethnography, customs, behavior and law. The Staff

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. 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. 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. Groos

257. Seminar in the Age of Goethe.

Mr. Bahr

258. Seminar in Romanticism.

Mr. Bahr, Mr. Johnson, Mr. Nehring

259. Seminar in 19th Century Literature.

Mr. Bahr, Mr. Johnson, 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. Mr. Schmidt

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; W. D. Hand, 500WH; E. B. Johnson, 599EJ; A. Karnein, 599AK; D. R. McCann, 599DM; W. Nehring, 599WN; V. A. Oswald, Jr., 599VO; V. W. Robinson, 599VR; P. Schmidt, 599PS; 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.**

Mr. Kooij

101B. Elementary Afrikaans.

Mr. Kooij

101C. Intermediate Readings in Dutch-Flemish and Afrikaans.

Prerequisite: course 101A or 101B, or consent of the instructor. Mr. Kooij

112. Dutch, Flemish, Afrikaans Literature in Translation.

Readings and analysis of selected works in translation from Dutch, Flemish, and Afrikaans Literature. Mr. Kooij

199. Special Studies in Dutch-Flemish and Afrikaans. (½ to 1 course)

Mr. Kooij

Hungarian**101A. Elementary Hungarian.**

(Formerly numbered Finno Ugric 150.) Introduction to grammar and reading exercises, emphasis on the spoken language. Mrs. Birnbaum

101B. Intermediate Hungarian.

(Formerly numbered Finno-Ugric 151.) Prerequisite: course 101A or the equivalent. Grammatical exercises and reading of texts. Mrs. Birnbaum

101C. Advanced Hungarian.

(Formerly numbered Finno-Ugric 152.) Prerequisite: course 101B or the equivalent. Readings in literary texts. Mrs. Birnbaum

120A-120B. Readings in Hungarian.

(Formerly numbered Finno-Ugric 153A-153B.) Prerequisite: course 101C or the equivalent. Large selections of Hungarian prose and poetry read in the original. Mrs. Birnbaum

121A-121B. Survey of Hungarian Literature in Translation.

(Formerly numbered 158A-158B.) 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

M135. Introduction to Hungarian Folklore and Mythology.

(Same as Folklore M128.) A general course for the student in folklore and mythology, with emphasis on types of folklore and varieties of folklore research. Mrs. Birnbaum

M136. Folklore and Mythology of the Ugric Peoples.

(Same as Folklore M129.) Survey of the traditions of the smaller Ugric nationalities (Voguls, Ostyaks, etc.). Mrs. Birnbaum

Scandinavian Languages**Preparation for the Major**

Required: courses 1, 2, 3, 4, 5, or 11, 12, 13, 14, 15, or 21, 22, 23, 24, 25 and 30, or their equivalents.

The Undergraduate Major in Scandinavian

Nine upper division courses in Scandinavian, including courses 141, 142 and 143, plus three upper division courses which may be chosen from courses in Scandinavian or related linguistic or literary fields of study. It is recommended that students who plan to do graduate work in Scandinavian satisfactorily complete German 6 or its equivalent.

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.

Requirements for the Master's Degree

1. For the general requirements, see pages 147-149.

2. Students entering the M.A. program in Scandinavian will be required to have completed an undergraduate major in Scandinavian, or its equivalent.

3. A reading knowledge of either German or French, at the discretion of the department, will be required for the M.A. degree in Scandinavian.

4. The M.A. in Scandinavian will consist of nine upper division and graduate courses in Scandinavian, of which at least five must be graduate courses. In addition, three courses on the upper division or graduate level must be taken in a related field of linguistic or literary study to be determined by consultation with the Graduate Adviser in Scandinavian. At least one of these three courses in a related field must be on the graduate level. A knowledge of Old Icelandic equivalent to courses 151 and 152 will be required of all candidates for the M.A. in Scandinavian.

5. A comprehensive examination will be required of all candidates for the M.A. degree in Scandinavian.

Requirements for the Doctor's Degree in Germanic Languages

A candidate for the Ph.D. in Germanic Languages may choose Scandinavian Literature and Philology as his major or his minor field. For details, see pages 151-154.

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 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

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

***24. Intermediate Danish.**

Prerequisites: course 23 or equivalent.

Mr. Massengale

***25. Intermediate Danish.**

Prerequisite: course 24 or equivalent.

Mr. Massengale

30. Intermediate Danish, Norwegian and Swedish.

(Formerly numbered 20) Prerequisite: either course 5, 15, or 25, or the equivalent. Readings in Danish, Norwegian and Swedish. Written and oral exercises.

The Staff

Upper Division Courses**105. Advanced Swedish.**

Prerequisite: course 30 or equivalent. Readings, composition, and conversation. Conducted in Swedish.

Mr. Wahlgren

106. Advanced Swedish.

Prerequisite: course 105 or equivalent. Readings, composition, and conversation. Conducted in Swedish.

Mr. Wahlgren in charge

110. Advanced Danish and Norwegian.

Prerequisite: Course 30 or equivalent. Advanced reading, composition and conversation in Danish and Norwegian. May be taken twice for credit.

Mr. Chapman, Mr. Massengale

M123A. Introduction to Finnish Folklore and Mythology.

(Same as Folklore M123A.) Prerequisite: consent of instructor. The methods and results of Finnish folklore studies and the mythic traditions of the Finns. Special attention is paid to the oral epic, beliefs and legends.

Mrs. Rank

M123B. Finnish Folksong and Ballad.

(Same as Folklore M123B.) Prerequisite: consent of instructor. A survey of Finnish balladry and folksong, with attention to historical development, ethnic background, and poetic and musical values.

Mrs. Rank

M125. Folklore and Mythology of the Lapps.

(Same as Folklore M125.) Prerequisite: consent of instructor. Survey of Lappish beliefs, customs, and various genres of oral tradition including tales, legends, songs and music. Attention is also paid to the material manifestations of Lappish culture: arts and crafts, textiles, costume, folk technology.

Mrs. Rank

130. Elementary Finnish.

Introduction to pronunciation and grammar.

Mrs. Rank

131. Intermediate Finnish.

Prerequisite: course 130 or equivalent. Grammatical exercises and readings.

Mrs. Rank

132. Advanced Finnish.

Prerequisite: Course 131 or equivalent. Readings, composition and conversation.

Mrs. Rank

133. Readings in Finnish.

Prerequisite: Course 132 or equivalent. Readings and discussions of selected Finnish literary texts in the original.

Mrs. Rank

138A. Finnish Literature of the 19th Century.Intended for students in general and comparative literature as well as students interested in Finnish studies. Special attention is paid to the *Kalevala*. Conducted in English; no knowledge of Finnish required.

Mrs. Rank

138B. Modern Finnish Literature.

Readings and discussions of modern Finnish prose and poetry. Conducted in English; no knowledge of Finnish required.

Mrs. Rank

141. Medieval Scandinavian Literature.

Readings and discussions of selected works from 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.

Prerequisite for Scandinavian majors: course 30 or equivalent. For nonmajors: no knowledge of a Scandinavian language is required. Readings and discussions of selected works from the literature of Scandinavia in the 18th and 19th centuries. The Staff

143. Modern Scandinavian Literature.

Prerequisite for Scandinavian majors: course 30 or equivalent. For nonmajors: no knowledge of a Scandinavian language is required. Readings and discussions of selected works of modern Scandinavian literature.

The Staff

144. Ibsen.

Prerequisite for Scandinavian majors: course 30 or equivalent. For nonmajors: no knowledge of a Scandinavian language is required. Readings and discussions of selected plays by Henrik Ibsen.

Mr. Zentner

145. Strindberg.

Prerequisite for Scandinavian majors: course 30 or equivalent. For nonmajors: no knowledge of a Scandinavian language is required. Readings and discussions of selected plays by August Strindberg.
Mr. Massengale, Mr. Zentner

151. Elementary Old Icelandic.

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.

Prerequisite: course 151. Readings of Old Icelandic prose and poetry.

Mr. Chapman, Mr. Wahlgren

153. Modern Icelandic.

Prerequisite: course 152. Grammar, readings, composition, and conversation.

Mr. Chapman

185. Scandinavian Literary History and Bibliography.

Selected readings in the standard literary histories for Denmark, Iceland, Norway and Sweden. Introduction to Scandinavian bibliography. Required for the M.A. in Scandinavian and of graduate students offering Scandinavian as a minor field for the Ph.D.

Mr. Wahlgren

190. Honors Course in Scandinavian.

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-199ZZ. 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.**

Prerequisite: graduate status, and a thorough knowledge of one or more Scandinavian languages. An examination of the Scandinavian languages to ascertain their similarities and dissimilarities to one another as well as to other languages and to dialects of the Germanic group of languages. Mr. Chapman

212. History of the Scandinavian Languages.

Prerequisite: graduate status, and preferably course 211. Development of the Scandinavian languages from the oldest period to the present. Runic inscriptions, Old Norse-Icelandic records and modern development will be traced.

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).

Prerequisite: course 152 or equivalent. Readings in advanced poetic texts, Eddic and Skaldic.

Mr. Chapman, Mr. Wahlgren

M245. Scandinavian Mythology.

(Same as German M245A.) Prerequisite: Knowledge of German, a Scandinavian language, or consent of the instructor.

Mr. Wahlgren

251. Henrik Ibsen.

Intensive study of the works of Ibsen. Prerequisite: Course 144 and an advanced knowledge of Norwegian.

Mr. Massengale, Mr. Zentner

252. August 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.

The Staff

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. graduate course requirement.

599A-599ZZ. 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; J. R. Massengale 599JM; 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.*

Fawn M. Brodie, Ph.D., *Professor of History.*

Truesdell S. Brown, Ph.D., *Professor of History.*

John G. Burke, Ph.D., *Professor of History.*

- E. Bradford Burns, 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*.
 Raymond H. Fisher, Ph.D., *Professor of History*.
 John S. Galbraith, Ph.D., *Professor of History*.
 Frank O. Gatell, Ph.D., *Professor of History*.
 Jere C. King, Ph.D., *Professor of History*.
 Nikki Keddie, Ph.D., *Professor of History*.
 Barisa Krekic, Ph.D., *Professor of History*.
 Gerhart B. Ladner, Ph.D., *Professor of History*.
 James M. Lockhart, 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 J. Shaw, Ph.D., *Professor of History*.
 Arthur J. Slavin, 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*.
 Lynn White, Jr., Ph.D., *Professor of History*.
 James W. Wilkie, Ph.D., *Professor of History*.
 Robert Wohl, Ph.D., *Professor of History (Chairman of the Department)*.
 Stanley A. Wolpert, Ph.D., *Professor of History*.
 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*.
 Claus-Peter Clasen, Ph.D., *Associate Professor of History*.
 Robert Dallek, Ph.D., *Associate Professor of History (Vice Chairman of the Department)*.
 David M. Farquhar, Ph.D., *Associate Professor of History*.
 Amos Funkenstein, Ph.D., *Associate Professor of History*.
 Richard Hovannisian, Ph.D., *Associate Professor of History*.
 Norris C. Hundley, Ph.D., *Associate Professor of History*.
 John H. M. Laslett, D.Phil., *Associate Professor of History*.
 Peter Loewenberg, Ph.D., *Associate Professor of History*.
 Afaf Marsot, D. Phil., *Associate Professor of History*.
 D. C. Moore, Ph.D., *Associate Professor of History*.
 Gary B. Nash, Ph.D., *Associate Professor of History*.
 Fred G. Notehelfer, Ph.D., *Associate Professor of History*.
 Boniface I. Obichere, D.Phil., *Associate Professor of History*.
 Richard H. Rouse, Ph.D., *Associate Professor of History*.
 Damodar R. SarDesai, 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*.

Richard Weiss, 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. Griffeth, Ph.D., *Assistant Professor of History.*
 Thomas S. Hines, Ph.D., *Assistant Professor of History.*
 Philip C. Huang, Ph.D., *Assistant Professor of History.*
 Michael O. Jones, Ph.D., *Assistant Professor of History.*
 Temma E. Kaplan, Ph.D., *Assistant Professor of History.*
 Franklin F. Mendels, Ph.D., *Assistant Professor of History.*
 H. Viscount Nelson, Ph.D., *Assistant Professor of History.*
 Peter H. Reill, Ph.D., *Assistant Professor of History.*
 Geoffrey W. Symcox, Ph.D., *Assistant Professor of History.*
 Robert S. Westman, Ph.D., *Assistant Professor of History.*
 Paul B. Worthman, M.A., *Assistant Professor of History.*
 ———, *Assistant Professor of History.*
 ———, *Assistant Professor of History.*
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 ———, *Assistant Professor of History.*
 ———, *Assistant Professor of History.*
 ———, *Assistant Professor of History.*



Lutz K. Berkner, M.A., *Acting Assistant Professor of History.*
 Clayborne Carson, M.A., *Acting Assistant Professor of History.*
 Albert Hoxie, M.A., *Lecturer in History.*
 Miriam Lichtheim, Ph.D., *Lecturer in History.*
 Juan Gomez-Quinones, M.A., *Lecturer in History.*

Preparation for the Major

Required: courses 1A–1B–1C and 99. Two additional lower division quarter courses taken from the following sequences: History 2A–2B (Technology); History 8 plus one suitable upper division course (Latin America); History 9A–9B–9C (Far East); History 9D plus one suitable upper division course (Near and Middle East); History 10A–10B. These two courses must be chosen from the same field.

History majors must take at least two one-quarter courses in U.S. history. These may be chosen from 6A–6B–6C and from upper division courses.

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). One quarter course from the 6A–6B–6C sequence may be

applied to this requirement, provided the one quarter course is not used to meet any other requirement of the major.

The Major

A minimum of ten upper division courses in history which must include History 100 (unless History 99 has been taken in the lower division) and either History 197 or 199. Both 197 and 199 may be used to satisfy this requirement.

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 151–154 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 a comprehensive oral examination at the end of the senior year in defense of their honors thesis.

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), 6A-6B-6C (History of the American Peoples), 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.

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 December 30. 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 147.

Foreign Language. A reading knowledge of a foreign language approved by the Department. It is recommended that this requirement be met by the second quarter of graduate work.

Units of Work. A minimum (and preferably a maximum) of nine upper division and graduate courses in history, at least five of which must be graduate courses. 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 pages 150-151). The nature of the examination will be determined by the candidate's committee.

Not later than the third week of his second quarter of graduate study each candidate

for the M.A. will choose an adviser who, together with two other members of the Department, will constitute his M.A. committee. In consultation with this committee and in consonance with Graduate Division requirements the candidate will determine his program of study. This program will involve three courses (including at least one graduate seminar or topics course) wherein he will write papers or take examinations, under three different professors, which will constitute the comprehensive examination. The courses from which papers are to be submitted to the committee must be indicated in advance.

After no fewer than three and no more than six quarters of full-time graduate work (and having passed one language examination), the candidate will submit the written parts of his M.A. examination to his committee, preferably all of whom (and at least the chairman) have directed material submitted for the examination. The committee will review (a) the comprehensive examination material submitted by him or her, as well as (b) the student's overall record. The committee will then recommend the following results: Pass to Continue; Pass on Probation; Terminal Pass; Fail. In cases where the M.A. is awarded with "Pass on Probation," the committee will conduct a special reevaluation of the candidate's progress after not more than an additional three quarters of study.

Students who do not complete the Master's degree in six quarters will be dropped from departmental rolls automatically unless upon petition they are excepted by the Graduate Guidance Committee.

Special Requirements for Admission to the Doctoral Program

All students must be evaluated formally before proceeding to the Ph.D. degree. For the student who enters the graduate program with only a B.A. degree, this evaluation (see M.A. requirements above) must occur within the period of six quarters.

For the student who enters with a Master's degree from another department, evaluation must be completed by the end of three quarters of study in our department in order to determine whether or not he will be permitted to continue toward the Ph.D. This evaluation will be conducted in the same manner as described above under "Requirements for the Master's Degree."

All candidates must present to the Graduate Guidance Committee a letter from the

faculty member who has agreed to sponsor his work for the Ph.D. according to the following schedule: by the end of the sixth quarter or earlier for students entering with only a B.A.; and by the end of the third quarter or earlier for students entering with an M.A. from another department.

Students who do not meet these time limits on evaluation and sponsorship will be dropped from the departmental rolls automatically, unless upon petition they are excepted by the Graduate Guidance Committee.

Requirements for the Doctor's Degree

A candidate for the degree of Doctor of Philosophy in history must meet (a) the "Special Requirements for admission to the Doctoral Program" listed above; and (b) the general requirements set forth on pages 151-154. 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 one foreign language, 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 an examination in at least one foreign language.

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. Any one foreign language plus a second language, or a substitute requirement which must be arranged with the consent of the doctoral candidate's chief adviser. The second language requirement is to be met through the ETS examination with a score of 500 or above. Alternatively the student may satisfy his second language requirement with two courses in a second language with a grade of B or better. As a substitute for the second language, students may develop sufficient competence in an ancillary analytic skill as evidenced by grades of B or above in two quarters of course work.

9. Latin American History. Two of the following options: Spanish, Portuguese, or special methodological studies.

10. Russian History. Russian and Ger-

man 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 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 must take his qualifying examinations not later than the end of his ninth quarter of graduate work. (See "Time Limits for Completion of Stages Leading to the Doctor's Degree" listed below.)

Fields of Examination. Ancient Greece; Ancient Rome; The Early Middle Ages, 300-1100; The Later Middle Ages, 1050-1500; Byzantine History; Russia since 862; Medieval England; England, 1485-1763; England since 1763; The British Empire; The Near East, 500-1500; The Near East since 1500; Ancient Near East; Armenian History; 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. For the time limit on completion of the dissertation, see immediately below.

Time Limits for Completion of Stages Leading to the Doctor's Degree

After completion of the Bachelor's degree (and including all postgraduate work in this or other departments), the following schedule is mandatory:

(1) Oral examination must be completed by the end of the ninth quarter.

(2) Dissertation must be completed within twenty quarters (including leaves of absence following completion of the oral examination).

Candidates will be dropped from departmental rolls automatically if they exceed these time limits for completion of the oral examination and dissertation, unless they petition to the Graduate Guidance Committee for an extension. This petition must be endorsed by the candidate's sponsoring professor before it can be evaluated by the Committee.

Annual Evaluation of all Graduate Students

In addition to the evaluation processes involved in (1) the Master's examination; (2) the admission of students to the Doctoral program; (3) the Doctoral qualifying examinations; and (4) the preparation of the Doctoral dissertation, the department's Graduate Guidance Committee will conduct an annual evaluation of all graduate students each spring quarter. This evaluation will be made in consultation with the entire departmental faculty in order that appropriate action may

be taken in cases of problematic student progress.

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

6A-6B-6C. History of the American Peoples.

A survey of the American peoples from the advent of aboriginal society to the present, emphasizing racial and ethnic interaction, industrialization, urbanization, and cultural change.

Mr. Nash, Mr. Saxton, Mr. Thernstrom

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 Japanized 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. Noteheiser, 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.

Mr. Keddle

10A-10B. A Cultural Survey of Africa.

Offered as an alternative to the cultural surveys on Asia, the Middle East, and Latin America as a means of satisfying the new requirements for History Majors. Students will normally take both quarters.

Mr. Griffith, Mr. Ranger

M15. Introduction to American Folklore Studies.

(Same as Folklore M15.) Lecture and discussion. A cultural-historical survey of the role of folklore in the development of American civilization and of the influence of the American experience in shaping folklore in American society; attention will also be given to representative areas of inquiry and analytical procedures.

Mr. Jones

M70. Survey of Mediaeval Greek Culture.

(Same as Classics M70.) Classical roots and mediaeval manifestations of Byzantine civilization: political theory, Roman law, pagan critique of Christianity, literature, theology, and contribution to the Renaissance (including the discovery of America).

Mr. Anastos

99. Introduction to Historical Practice.

Course will take the form of undergraduate seminars of not more than 15 students meeting with a faculty member. Seminars will explore how works of history are written by focusing on a selected book.

The Staff

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 348.

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

104. Explorations in Psychoanalysis and History.

Prerequisite: consent of instructor. The course will study the art of psychological and historical interpretation, and will assess recent writings in the field of psychohistory. Limited to 35 students. Mr. Wohl

M105. Folklore in American Society.

(Same as Folklore M105.) Prerequisite: Folklore or History M15 or Folklore 101. Lecture and discussion. An examination of folkloristic data within the context of American cultural history, the means of identifying and analyzing traditional expressive behavior, and the kinds of research opportunities available to those with an interest in the interrelationships between folklore and other aspects of American social behavior. Mr. Jones

106A-106F. History of Science.

Science and scientific thought in relationship to society.

106A. Physical Sciences from Ancient Times to the 17th Century. Mr. Westman

106B. Physical Sciences from 17th to the 20th century. Mr. Burke

106C. Physical Sciences, 20th century.

Mr. Berger, Mr. Burke

106D. Science in America.

Mr. Borden

106E. Biological Sciences from Ancient Times to the 17th century.

106F. Biological Sciences from 17th to 20th century.

M107. Scientific Dating Methods in History.

(Same as Anthropology M175C.) 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

108. Aspects of Medieval and Renaissance Science.

Prerequisite: Course 106A or permission of the instructor. An intensive study of the physical sciences from the twelfth to the early seventeenth century in relation to theology, natural magic, Aristotelianism, Platonism and other philosophical traditions. Mr. Westman

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 Macedonia.

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

M122A-M122B. Byzantine Civilization.

M122A. (Same as Classics M170A.) Emphasis is laid on Byzantine theology.

M122B. (Same as Classics M170B.) Literature, relations with Rome, and the Renaissance.

Mr. Anastos

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, magic, wisdom and moral conduct.

Mr. Buccellati

124D. History of Religions: Myth.

Course of an introductory character (like courses 124A and 124B), but focusing on the function of myth in religion and culture. Mr. Bolle

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. Mrs. Keddle

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.

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.

137A-137B. Jewish Intellectual History.

(Formerly numbered 139C.) 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 cabalism. 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.

139B. Sixteenth to the nineteenth century. Mr. Vryonis

139C. Nineteenth and twentieth centuries. Mr. Shaw

140A-140B. History of Ancient Mesopotamia and Syria.

The political and cultural development of the "Fertile Crescent," including Palestine, from the Neolithic to the Achaemenid period. Mr. Buccellati

141A-141B. History of Modern Europe.

141A. The Renaissance. Mr. Martinez

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. Reill

141G. Europe in the 20th Century. Mr. King, Mr. Wohl

142A-142E. 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 Century. Mr. Hoxie, Mr. Funkenstein

142C. 18th Century. (Formerly numbered 142B.) Mr. Hoxie, Mr. Reill

142D. 19th Century.

Mr. Loewenberg, Mr. Weber, Mr. H. White

142E. 20th Century. (Formerly numbered 142D.) Mr. Loewenberg, Mr. Weber, Mr. Wohl

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-146D. History of Russia.

146A. From 1240-1796.

Political, social, and economic developments, and foreign relations in the Muscovite and imperial periods. Mr. Fisher, Mr. Rogger

146B. 1796-1917.

The Great Reforms, the agrarian problem and backwardness, the radical movement, the revolution of 1905; foreign relations, especially the Near East.

ern question. Either part of the course may be taken without the other. Mr. Fisher, Mr. Rogger

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

146D. Social Thought and Movements in Modern Russia.

(Formerly numbered 206.) Prerequisites: A background in Russian history or literature or European social thought. An examination of the major trends of Russian social and political thought, and of the major movements embodying them, from the late 18th to the early 20th centuries. 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

148C-148D. 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 the Balkans: From the Middle Ages to Modern Times.

149A. Western Balkan Peoples, 7th to 15th century.

149B. Eastern Balkan Peoples, 7th to 15th century.

149C. Balkans from the 16th to 20th century.

Mr. Krekic

150A-150H. Studies in English History.

150A-150B. Medieval England.

Mrs. Searle

150G-150H. Modern England.

150E-150F. Early Modern England. Mr. Brenner
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

159. History of Canada.

A survey of the growth of Canada into a modern state from its beginnings under the French and British colonial empires. Mr. Galbraith

160A-160I. Topics in European Social History.

160A. Social Movements.

Miss Kaplan

160B. Peasants and Agrarian Society. Mr. Brenner

160C. Urban Society. Mr. Symcox

160D. Aristocracy and Nobility. Mr. Berkner

160E. Population.

Mr. Mendels

160F. The Family.

Miss Kaplan

160G. Psycho-history. Mr. Loewenberg, Mr. Wohl

160H. Quantitative Methods.

Mr. Berkner

160I. Special Topics.

The Staff

161A-161B. Topics in European Economic History.

(Formerly numbered 102A-102B.)

161A. Medieval and Early Modern period.

161B. The Industrial Revolution. Mr. Mendels

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. Burr

162B. Latin America in the 20th 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

163C. Brazilian Intellectual History.

The general intellectual development of Brazil with emphasis on those introspective movements in which the Brazilians attempted to interpret themselves, their nation, and their civilization. Mr. Burns

166. The Mexican Revolution Since 1910.

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. Mr. Lockhart

169. Latin American International Relations Since Independence.

Emphasis is given to the developing interests of the Latin American nations in their relationship with one another and with other areas of the world.

Mr. Burr

170. Industrialization and Social Change in the American South, 1865-1910.

An analysis of Southern industrialization and its impact upon community life, politics, class and racial patterns. Mr. Worthman

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

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

171C-171D. The United States: History of Women in America.

171C. An analysis of the social, cultural, political, and economic history of women in America from the colonial period to 1890. The major emphasis will be placed on the expanding self-consciousness of white middle class women in the nineteenth century.

171D. A study of the social, cultural and political history of women in twentieth century America.

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. 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. Carson, Mr. Nelson

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 for-

sign 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. Himes

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. Himes

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.

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

187. American Political Biography.

Leading American statesmen, as seen through the best of their biographies, with an examination of the making and unmaking of American heroes, and changing fashions in the art of biography.

Mrs. Brodie

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-D. History of China.

Prerequisite: Course 9B or 191A or equivalent readings are prerequisite to 191B.

191A. Origins to 900.

191B. 900-1600.

191C. 1600-1800.

191D. 1800 to the present.

Mr. Farquhar, Mr. Huang

192. Asians in American History.

A study of the politically troubling question of entry into the United States of immigrants ineligible for citizenship, and their citizen children in American history. Mr. Wilson

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

194. The Chinese Revolution.

From the founding of the Chinese Communist Party to the present. Special emphasis on: the evolution of Mao's thought, the history of the Communist movement, the conditions in the Chinese countryside, and revolutionary developments under the People's Republic. Mr. Huang

195A-195B-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 mod-

ern 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.

Prerequisite: consent of instructor. Two courses only may be taken for credit. An intensive directed research program. Enroll in Department. The Staff

Graduate Courses**200-228. Graduate Lecture Courses and Colloquia.**

Prerequisite: graduate status or, with permission of instructor, upper division standing.

201A. History of the Eurasian Nomadic Empires.

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.

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. Martinez

207. Armenian Intellectual History.

Intellectual and cultural trends reflected in Armenian literature, historiography, religious and philosophical thought. Mr. Sanjian

208. Modern British Biography.

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.

Social, intellectual and political change in Turkey, Iran and the Arab countries from Napoleon's invasion of Egypt to the present.

Mrs. Keddie, Mrs. Marriot

210A-210B. Morocco and Enrope 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.

Political, social and cultural history of Persia.

- | | |
|-------------------------|-------------|
| A. 600 to 1400. | Mr. Banani |
| B. 1400 to 1800. | Mr. Banani |
| C. 1800 to the Present. | Mrs. Keddle |

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. Notehelfer

M215A-215D. History of Western Education.

(Same as Education M201A-201D.)

M215A. The rise of western educational tradition from the Greeks to the 20th Century.

M215B. The history of American education to 1860.

M215C. History of American education from 1860 to 1945.

M215D. The history of American education, 1945 to the present.

Mr. S. 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

218A-218B. Modern Britain and the Continent:

Comparative Studies in Economic Change.

Prerequisite: course for 218B is 218A. The Industrial Revolution in Europe, with emphasis on the relationship between agrarian structure, population changes, and industrialization. Considerable attention is given to problems of methodology.

Mr. Mendels

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 sphragistics.

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

M226. Selected Topics in Dating Techniques in Archaeology and History.

(Same as Anthropology M296.) Prerequisite: course M107. 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. Hovannisian

†230A-230T. Advanced Historiography.

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.

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

250-288. 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. Vryonis

253A-253B. Seminar in Medieval History.

Mr. L. White

254A-254B. Seminar in the Italian Renaissance.

Mr. Martinez

† Offered as schedule and staff allow.

- 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. Martinez
- 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
- 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; 19th and 20th Centuries.** Mr. Burr
- 266C-266D. Seminar in Brazilian History.** Mr. Burns
- 266E-266F. Seminar in Recent Latin American History.** Mr. Wilkie
- 266G-266H. Seminar in Colonial Latin American History.** Mr. Lockhart
- 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.
- 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. Gattell
- 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. Nelson
- 278A-278B. Seminar in Medieval Intellectual History and History of Science.**
Chosen problems from medieval and early modern philosophy, science, political theory, theology. Mr. Funkenstein
- 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. Nohelifer, 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. Keddie
- 285A-285B-285C. Seminar in United States Urban History.** Mr. Thernstrom
- 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
- M267A. Topics in History of Education: Discussion, Research, and Writing.** (Same as Education M250A.) Mr. S. Cohen
- M267B. Seminar in bibliography and historiography in History of Education.** (Same as Education M250B.) Study of sources and new developments in the field. Emphasis will be on representative historians of education and their different modes of writing history. Mr. S. Cohen

288A-288B. Seminar in Comparative U. S.-European Radicalism.

Research seminar into problems of comparative socialism, radicalism and labor history, focusing on the development, strength and ideological characteristics of socialism in Europe, and its relative weakness in the United States, Canada, and elsewhere.

Mr. Laslett

Individual Study and Research

586. Directed Studies. (¼ to 2 courses) The Staff**587. Directed Studies for Graduate Examinations. (¼ to 2 courses)**

Preparation for either the Master's Comprehensive Examination or the Ph.D. Qualifying Examinations.

The Staff

■ HUMANITIES

Arnold J. Band, Ph.D., *Professor of Hebrew and Comparative Literature.*

Pier-Maria Pasinetti, Ph.D., *Professor of Italian and Comparative Literature.*

J. Norman H. Austin, Ph.D., *Assistant Professor of Classics and Comparative Literature.*

J. Douglas Canfield, Ph.D., *Assistant Professor of English.*

Richard K. Cross, Ph.D., *Assistant Professor of English.*

E. Bond Johnson, III, Ph.D., *Assistant Professor of German and Comparative Literature.*

Donald G. Marshall, Ph.D., *Assistant Professor of English.*

Ross P. Shideler, Ph.D., *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 plus one section per week.

The Staff

1B. World Literature: Renaissance to Modern Period.

Class meets three hours a week plus one section per week.

The Staff

101. The Romantic Dilemma.

Prerequisites: Humanities 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.

The Staff

102. Satire.

Prerequisites: Humanities 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

589. Doctoral Research and Writing.

(¼ 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.

and discussions of six Elizabethan-Jacobean plays, with emphasis on those themes and elements, such as revenge, the superman, theatricality and rhetorical 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.

The Staff

104. The Twentieth Century Continental Novel:

Mann and Proust.

Prerequisites: Humanities 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: Humanities 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

107. The Epic.

Prerequisite: Humanities 1A-1B, or English 1 and 2, or consent of the instructor. A survey of the epic as a literary form from Homer to Camoens, with analysis of individual works in relation to their contemporary societies and a comparison of the salient differences between oral and literary epic.

Mr. Austin

108. The Faust Theme.

Prerequisite: Humanities 1A-1B or English 1 and 2, or consent of the instructor. The course will explore artists' and intellectuals' use—and abuse—of their disciplines to find refuge from spiritual dryness. Readings of works by such writers as Marlowe, Goethe, Melville, Valéry, Mann, and Malcolm Lowry. Mr. Cross

109. The Crisis of Consciousness in Modern Literature.

Prerequisite: Humanities 1A-1B, or English 1 and 2, or consent of the instructor. Study of modern European and American works which are concerned both in subject matter and artistic methods with the growing self-consciousness of the artist and his society focusing on works of Flaubert, Joyce, Gide, Mann, and Nabokov. Mr. Johnson

110. Man and His Fictions.

Prerequisite: Humanities 1A-1B, or English 1 and 2, or consent of the instructor. An exploration of dialogue and tale-telling, the wisdom or knowledge they possess, how the exchange of tales defines and sustains a community, how a narrator clarifies his form and meaning for his audience. Readings from writers such as Plato, Dante, Proust, Freud. Mr. Marshall

111. Tragedy.

Prerequisite: Upper-division standing. Major tragic drama of the Western tradition: a study of theme and form. Mr. Canfield

112. Modern Poetry of the Western World.

Prerequisite: upper-division standing or consent of the instructor. A study of selected 19th or 20th century European and American poetry. Mr. Shideler

114. The Short Novel.

Prerequisite: Humanities 1A and 1B, or English 1 and 2, or consent of the instructor. A study of selected short novels as works of literary art and as relevant intellectual statements. Texts by Melville, Flaubert, Dostoevsky, Kafka, et al. Mr. Pasinetti

Related Courses in Other Departments**Integrated Arts 1A-1B-1C.**

Engineering 101. Engineering. Its Role and Function in Human Society.

■ INDO-EUROPEAN STUDIES

Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*

Marija Gimbutas, Ph.D., *Professor of European Archaeology (Department of Slavic Languages).*

Jaán Puhvel, Ph.D., *Professor of Indo-European Studies (Department of Classics).*

Harmut Scharfe, Ph.D., *Professor of Indic Studies (Department of Oriental Languages).*

Hanns-Peter Schmidt, Ph.D., *Professor of Indo-Iranian Studies (Department of Near Eastern Languages).*

Raimo A. Anttila, Ph.D., *Associate Professor of Linguistics.*

Patrick K. Ford, Ph.D., *Assistant Professor of Celtic Studies (Department of English).*

Stephen P. Schwartz, Ph.D., *Assistant Professor of German.*

Terence H. Wilbur, Ph.D., *Assistant Professor of German.*

Undergraduate Curriculum in Indo-European Studies

For details of the curriculum leading to the degree of Bachelor of Arts, see page 82.

Graduate Degrees (C.Phil. and Ph.D.)

These degrees are presently offered under the jurisdiction of the Department of Classics.

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.151.

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 candidate demonstrates beforehand adequate 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 comparatively 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 in 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 Slavonic 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 advancement to doctoral candidacy and conferral of the C.Phil. degree, 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 lan-

guages. 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

131. European Archaeology: The Neolithic Period.

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.

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

140. Introduction to Indo-European Mythology.

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

M150. Introduction to Indo-European Linguistics.

(Same as Linguistics M150.) 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

199. Special Studies. (½ to 2 courses)

The Staff

Graduate Courses

210. Indo-European Linguistics: Advanced Course.

Prerequisite: course 150 or the equivalent. Comparative study of phonology, morphology, syntax, and lexicon. Problems in analysis and reconstruction.

Mr. Anttila, 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

M250A-250B. Seminar in European Archaeology.
(½ course each)

(Same as Anthropology M285A-285B.) 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

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

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

596. Directed Individual Studies. (½ to 2 courses)
The Staff**597. Preparation for Doctoral Qualifying Examination. (½ to 2 courses)**
The Staff**599. Research for the Dissertation. (½ to 2 courses)**
The Staff

Related Courses in Other Departments

Ancient Near East (Near Eastern Languages)

- 160A-160B. Introduction to Near Eastern Archaeology.
- 161A-161B-161C. Archaeology of Mesopotamia.
- 260. Seminar in Ancient Near Eastern Archaeology.
- 261. Practical Field Archaeology.

Anthropology

- 109A-109B. Old Stone Age Archaeology.
- 123A-123B. Origins of Old World Civilization.
- 175A-175B Strategy of Archaeology.
- M175C. Dating Techniques in Archaeology and History.
- 175D. Methods and Techniques of Field Archaeology.
- 175E. Laboratory Analysis in Archaeology.
- 183. History of Archaeology.
- 230. Analytical Methods in Archaeological Studies.
- 232. Archaeology.
- 286. Selected Topics in Historical Reconstruction and Archaeology.

Archaeology

- 259. Field Work in Archaeology.

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.
- 166A. Greek Religion.
- 166B. Roman Religion.
- 251A. Seminar in Classical Archaeology.
- 255. Field Work in Greek Archaeology.
- 260. Seminar in Roman Religion.

English

- M111D. Introduction to Celtic Folklore and Mythology.
- 111E. Survey of Medieval Celtic Literature.
- 211. Readings in Old English Literature.
- 216A-216B. Old Irish.
- 217A-217B. Medieval Welsh.
- 218. Celtic Linguistics.

Folklore

- M122. Introduction to Celtic Folklore and Mythology.
- M126. Introduction to Baltic and Slavic Folklore and Mythology.

German

- 230. Survey of Germanic Philology.
- 231. Gothic.
- 232. Old High German.
- 233. Old Saxon.
- M245A. Germanic Religions and Mythology.
- 245B. Germanic Antiquities.
- 252. Seminar in Historical and Comparative German Linguistics.

Greek (Classics)

- 242A-242B. Greek Dialects and Historical Grammar.

Hindi (South Asian Languages)

- 171A-171B-171C. Hindi.

Iranian (Near Eastern Languages)

- 169. Civilization of Pre-Islamic Iran.
- 190A-190B. Introduction to Modern Iranian Studies.
- 210A-210B. The History of the Persian Language.
- 230A-230B. Old Iranian.
- 231A-231B. Middle Iranian.
- M222A-222B. Vedic.

Latin (Classics)

- 242A-242B. Italic Dialects and Latin Historical Grammar.

Linguistics

- 100. Introduction to Linguistics.

- 103. Introduction to General Phonetics.
- 110. Introduction to Historical Linguistics.
- 120A-120B. Linguistic Analysis.
- 160. History of Linguistics through the 19th Century.
- 200A. Phonological Theory I.
- 202. Historical Linguistics.
- 225A. Linguistic Structures: Indo-European.
- 225E. Linguistic Structures: Indo-Aryan.
- 270A-270B. Historical Linguistics. Seminar.

Oriental Languages

- 160. Elementary Sanskrit.
- 161. Intermediate Sanskrit.
- 162. Advanced Sanskrit.
- 165. Readings in Sanskrit.
- 166. Survey of Sanskrit Literature in Translation.
- 167. Introduction to Indic Philosophy.
- 214A-214B. Pali and Prakrits.
- 221A-221B. Introduction to Pāṇini's Grammar.
- M222A-222B. Vedic.

■ 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. The Staff

■ 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. B. I. Obichere, History (Chairman); Karen Courtenay, Linguistics; Gerry A. Hale, Geography; Leo J. Kuper, Sociology; Michael Lofchie, Political Science; J. Maquet, Anthropology; Rodney Vlasak, Music.

A colloquium on Africa in the social sciences will meet biweekly throughout the

Scandinavian (Germanic Languages)

- 151. Elementary Old Icelandic.
- 152. Intermediate Old Icelandic.
- M245. Scandinavian Mythology.

Semitics (Near Eastern Languages)

- 140A-140B. Elementary Akkadian.
- 141A-141B. Advanced Akkadian.
- 220A-220B. Ugaritic.
- 240. Seminar in Akkadian Language and Literature.

Slavic

- 177. Baltic Languages and Cultures.
- M179. Introduction to Baltic and Slavic Folklore and Mythology.
- 201. Introduction to Old Church Slavic.
- 202. Introduction to Comparative Slavic Linguistics.
- 241A-241B. Advanced Old Church Slavic.
- 242. Comparative Slavic Linguistics.

Urdu (Near Eastern Languages)

- 101-101B-101C. Elementary Urdu.

1B. Integrated Arts.

Lecture, three hours. From the Renaissance to the rise of Classicism. The Staff

1C. Integrated Arts.

Lecture, three hours. From the French Revolution to the present. The Staff

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, Economics and Management (Chairman); V. Barcilon, Mathematics; J. L. Barnes, Engineering; P. Bonacich, Sociology; E. C. Carterette, Psychology; T. S. Ferguson, Mathematics; J. Hirshleifer, Economics; M. Kay, Linguistics; D. Marvick, Political Science.

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.

Political Change

Committee in Charge. M. Lofchie, Political

Science (Chairman); L. Kuper, Sociology; F. Rabinowitz, Political Science; J. R. Sisson, Political Science; D. Wilson, 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.

■ ISLAMIC STUDIES (INTERDEPARTMENTAL)

For details of the undergraduate major, see Curriculum in Near Eastern Studies, page 84 of this catalog.

Master of Arts in Islamic Studies

The interdepartmental 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 147.

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.

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 his 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 fewer 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 151-154.

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 is expected to 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.

Hebrew.*

History 9D. History of the Near and Middle East.

10A-10B. A Cultural Survey of Africa.

99. Introduction to Historical Practice.

Music 71K. Music of Persia.

Upper Division Courses

African Languages.†

Ancient Near East 120A-120B-120C. Elementary Ancient Egyptian.

123A-123B. Coptic.

160A-160B. Introduction to Near Eastern Archaeology.

161A-161B-161C. Archaeology of Mesopotamia.

199. Special Studies in the Ancient Near East.

Anthropology 122A. Comparative Society.

140. Comparative Religion.

145. Culture and Personality.

Arabic 102A-102B-102C. Intermediate Arabic.

103A-103B-103C. Advanced Arabic.

111A-111B-111C. Spoken Egyptian 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.

199. Special Studies in Arabic.

Armenian 101A-101B-101C. Elementary Modern Armenian.

102A-102B-102C. Intermediate Modern Armenian.

103A-103B. Advanced Modern Armenian.

* See Department of Near Eastern Languages for complete listing and detailed description.

† See Linguistics Department for complete listing and detailed description.

- 130A-130B. Elementary Classical Armenian.
 131A-131B. Intermediate Classical Armenian.
 132A-132B. Advanced Classical Armenian.
 199. Special Studies in Armenian Language and Literature.
- Art** 101A-101B-101C. Egyptian Art and Archaeology.
 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.
 115A. Advanced 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.
- 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.
- 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.
 124C. Religions of the Ancient Near East.
 129. History of Northeast Africa.
 131A-131B-131C. Armenian History.
 132. The Caucasus since 1801.
 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.
 137A-137B. Jewish Intellectual History.
 138A-138B. Jewish History.
 139A-139B-139C. History of the Turks.
 140A-140B. History of Ancient Mesopotamia and Syria.
 149A-149B-149C. History of the Balkans.
 196A. Early History of India.
 196B. Recent History of India and Pakistan.
 197. Undergraduate Colloquia.
 199. Special Studies in History.
- Iranian** 101A-101B-101C. Elementary Persian.
 102A-102B-102C. Advanced Persian.
 150A-150B. Survey of Persian Literature in English.
 169. Civilization of Pre-Islamic Iran.
 170. Religion in Ancient Iran.
 190A-190B-190C. Introduction to Modern Iranian Studies.
 199. Special Studies in Persian.
- Music** 145. History and Theory of Persian Music.
 148. Music of the Near East.
 171K. Music of Persia.
- Near Eastern Languages** 198. Special Studies in Near Eastern Languages.
- 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.
- Turkic Languages** 101A-101B. Elementary Turkish.
 102A-102B. Intermediate Turkish.
 103A-103B. Advanced Turkish.
 111A-111B-111C. Chagatai.
 112A-112B-112C. Uzbek.
 190A-190F. Survey of the Turkic Languages.
 199. Special Studies in Turkic Languages.

* See Department of Near Eastern Languages for complete listing and detailed description.

Graduate Courses

African Languages.†

Ancient Near East 210. Late Egyptian.

220. Seminar in Ancient Egypt.

250. Seminar in Ancient Mesopotamia.

260. Seminar in Ancient Near Eastern Archaeology.

261. Practical Field Archaeology.

596. Directed Individual Study.

597. Examination Preparation.

599. Dissertation Research and Preparation.

Arabic 220A-220B-220C. Islamic Texts.

230A-230B-230C. Arabic Poetry.

240A-240B-240C. Arab Historians and Geographers.

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 Armenian 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.

Classics. Greek 231A-231B-231C. Seminar in Patristic and Byzantine Literature.

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.

228. Methods in Armenian Oral History.

230J. Advanced Historiography. The Near East.

230R. Advanced Historiography. Jewish History.

230S. Advanced Historiography.

Armenian

240J. Topics in History. The Near East.

240P. Topics in History: History of Religions.

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.

286A-286B. Seminar in Armenian History.

596. Directed Studies.

597. Directed Studies for Graduate Examinations.

599. Doctoral Research and Writing.

Iranian 220A-220B. Classical Persian Texts.

222A-222B. Vedic.

230A-230B. Old Iranian.

231A-231B. Middle Iranian.

250. Seminar in Persian Literature.

596. Directed Individual Study.

597. Examination Preparation.

599. Dissertation Research and Preparation.

Islamic 596. Directed Individual Study.

597. Examination Preparation.

598. Thesis Research and Preparation.

599. Dissertation Research and Preparation.

* See Department of Near Eastern Languages for complete listing and detailed description.

† See Linguistics Department for complete listing and detailed description.

Linguistics 220A. Linguistic Areas. Africa.
225M. Linguistic Structures: Berber.

Near Eastern Languages 200. Bibliography and Method of Near Eastern Languages and Literatures.

M241. Folklore and Mythology of the Near East.

596. Directed Individual Study.

597. Examination Preparation.

599. Dissertation Research and 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.

210. Ancient Aramaic.

215A-215B. Syriac.

225. Phoenician.

230. Seminar in Northwest Semitic Languages and Literatures.

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.

Turk Languages 210A-210B-210C. Ottoman.

211. Ottoman Diplomats.

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 and Comparative Literature*.

Charles Speroni, Ph.D., *Professor of Italian*.

Margherita Cottino-Jones, Ph.D., *Associate Professor of Italian*.

Franco Betti, Ph.D., *Assistant Professor of Italian*.

Franco Masciandaro, Ph.D., *Assistant Professor of Italian*.

———, *Assistant Professor of Italian*.



Althea Reynolds, M.A., *Lecturer in Italian*.

Edward F. Tuttle, M.A., *Acting Assistant Professor of Italian*.

Preparation for the Major

Courses 1, 2, 3, 4, 5, 6, and 25, or their equivalents.

The Major

Required: 12 upper-division courses in Italian literature, including one course from the Italian 102 A-B-C series, Italian 113A, 113B, and 113C, and eight additional courses chosen from Italian 114 through 120. Strongly recommended: three upper-division courses from other departments as follows: Classics 143 or 144, History 148A or 148B,

and English 110. Recommended: Art 106A, 106B, or 106C; upper-division courses in another literature and philosophy; and a second language (Latin, French, Spanish, or German) at least on level 3. All majors must organize their programs in consultation with their major adviser.

Requirements for the Master's Degree

General Requirements. See pages 148-149. The Department favors the Comprehensive Examination Plan, but, with departmental approval, the Thesis Plan may be followed. See pages 150-151.

Program A: Master of Arts in Italian Literature

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 candidate 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, or evidence of successful completion of courses through at least level 3. This requirement must be met at least one quarter before the date of the comprehensive examination.

2. Courses. Twelve courses, three of which may be upper division, and 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 can-

didate may be required to take an oral examination.

Program B: Master of Arts in Italian Language

The program is designed as a terminal degree program with emphasis on the methodology of teaching language and elementary literature.

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 candidate has completed two full quarters of work with graduate standing in the Department.

1. Foreign Language. A reading knowledge of one other foreign language approved by the graduate adviser, or evidence of successful completion of courses through at least level 3. This requirement must be met at least one quarter before the date of the oral examination.

2. Courses. Twelve courses, six of which must be on the graduate level and distributed as follows: two in the Medieval Period (seminars on Dante strongly recommended); two in the Renaissance Period; and two in the Modern Period (courses in the twentieth century recommended). Italian 130A and 130B. Italian 259A and 259B. Latin 232 (Vulgar Latin). Linguistics 100 or 140, or both.

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.

Departmental Requirements. Comprehensive Examination Plan. 1. Foreign Language. A reading knowledge of one other foreign language approved by the graduate adviser, or evidence of successful completion of courses through at least level 3. This requirement must be met at least one quarter before the date of the comprehensive examination.

2. Courses. Twelve courses, six of which must be on the graduate level and distributed as follows: two in the Medieval Period (seminars on Dante strongly recommended); two in the Renaissance Period; and two in the Modern Period (courses in the twentieth cen-

tury recommended). Italian 130A and 130B. Italian 259A and 259B. Latin 232 (Vulgar Latin) or Italian 210A.

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 151.

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. 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 pages 150-151.).

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 four hours weekly plus one hour in the laboratory. The Staff

1A. Elementary Italian—Accelerated. (2 courses)

Sections meet eight hours weekly. Designed for those students having the capacity and desire to learn the language at a much faster pace than normal. Encompasses material ordinarily intended for courses 1 and 2. Miss Merino

2. Elementary Italian—Continued.

Sections meet four hours weekly plus one hour in the laboratory. Prerequisite: course 1 or one year of high school Italian. Mrs. Cheeseman in charge

2A. Elementary Italian—Accelerated (Continued), (2 courses)

Sections meet four hours weekly plus one hour in the laboratory. Prerequisite: Italian 2 or Italian 1A, or two years of high school Italian. Designed for those students having the capacity and desire to learn the language at a much faster pace than normal. Encompasses the material ordinarily intended for Italian 3 and Italian 4. Miss Merino

3. Elementary Italian—Continued.

Sections meet four hours weekly plus one hour in the laboratory. Prerequisite: course 2 or two years of high school Italian. Mrs. Cheeseman in charge

4. Intermediate Italian.

Sections meet four hours weekly plus one hour in the laboratory. Prerequisite: course 3 or three years of high school Italian. The Staff

5. Intermediate Italian.

Sections meet four hours weekly plus one hour in the laboratory. Prerequisite: course 4 or four years of high school Italian. The Staff

6. Intermediate Italian.

Sections meet four hours weekly plus one hour in the laboratory. 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 four hours weekly. Prerequisite: course 6. An advanced grammar and composition course with readings from select literary works.

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**

102A-102B-102C. Italian Culture and Institutions.

The courses are designed to familiarize the student with aspects and trends of Italian history and cultural development, including:

102A. History of the Italian Language.

102B. Social Institutions of Italy.

102C. History and Characteristics of Contemporary Italy. **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**

118A-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**

130A-130B. Advanced Grammar and Composition (Teaching).

130A. The Teaching of Italian Idiomatic Structure: Grammar. A study in depth of the idiomatic phenomena of the language from both the grammatical and syntactical points of view. **Mr. Chiappelli**

130B. The Teaching of Italian Idiomatic Structure: Vocabulary. Emphasis placed on the idiomatic linguistic phenomena from the point of view of the lexicon, such as: synonymia, homonymia, changes from literal to metaphorical connotations, archaisms, innovative trends. **Mr. Chiappelli**

131. Reading and Reciting. (½ course)

Prerequisite: Consent of the instructor based on sufficient knowledge of the language. **Mrs. Reynolds**

190. Pre-Seminars in Italian Literature. (½ course)

The Staff

199. Special Studies. (½ to 1 course)

Prerequisite: consent of the instructor. A course of independent study for advanced undergraduates who

wish to pursue a special research project under the direction and close supervision of a faculty member. **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.

Class meets three hours weekly. **The Staff**

140. Readings in the Italian Theatre in Translation.

Class meets three hours weekly. **The Staff**

150. Modern Italian Fiction in Translation.

Class meets three hours weekly. **The Staff**

Graduate Courses

201. Bibliography and Methods of Research.

Class 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).

The Staff

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.

The Staff

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. Pasinetti

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

219E. Verga.

Mr. Cecchetti

219F. Italian Literature at the Turn of the Century.
The Staff**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.

The Staff

220B. Contemporary Italian Poetry. Mr. Cecchetti

220C. Contemporary Italian Fiction. The Staff

M230A-230B. Folk Tradition in Italian Literature.(Same as Folklore M 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.

259A-259B. Studies in the History of Italian Language.259A. History of the Italian Language. Prerequisite: graduate status. A historical survey of the development of the language from Medieval times to the unification of the country (1861). *Questione della lingua*, general acceptance of Florentine speech, and its evolution into the national language. Mr. Tuttle

259B. The structure of Modern Italian. Prerequisite: graduate status. Various tendencies in modern and contemporary Italian. Foreign influences in today's Italian language. Relationship between the national language and the various dialects.

Mr. Chiappelli

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)

Jack Lyle, Ph.D., *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.*

William W. Johnson, M.A., *Emeritus Professor of Journalism.*



John R. Bennett, B.A., M.S.J., *Lecturer in Journalism.*

Michael J. Goodman, M.A., *Lecturer in Journalism.*

James Goodrich, M.A., *Lecturer in Journalism.*

Maury Green, B.A., *Lecturer in Journalism.*

James H. Howard, M.A., *Lecturer in Journalism.*

Nathan Kaplan, B.A., *Lecturer in Journalism.*

David M. Noyes, *Lecturer in Journalism.*

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. 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 professional content is contained in the three required professional courses, 400, 401 and 402. Opportunity is provided in this series for a specialization in newspaper, magazine or broadcast journalism. Specialization is provided through addition of elective and specialized courses to the required curriculum.

Coordinated with this professional 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. 192 (The Media of Mass Communications) provides analysis of the mass media in terms of function and structure. 204 (Ethnicity and Responsibility in Mass Communications) emphasizes critical analysis of media performance. 281 (Laws of Mass Communications) provides a basic foundation in law and regulatory agencies as it pertains to the mass media.

Electives may be chosen from other courses in the Department's curriculum or from other fields with the approval of the Graduate Adviser.

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 192, 204, 274, 275 (Research Methods in the Mass Media) and 281. Electives may be chosen from other courses in the Department's curriculum or from other fields with the approval of the Graduate Adviser.

The thesis topic must be approved by the Graduate Adviser 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.

The M.A. program requires competence in research methodology skills equivalent to basic social statistics. There is no foreign language requirement.

Undergraduate Courses

The Department offers 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 Adviser.

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.

101B. Non-Verbal Reporting.

Basic graphic arts illustration, and photo-journalism for the mass media.

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.

180. 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. Required for the master's degree.

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. Seminar in 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.

274. Seminar in Theories of Mass Communications.

Study of mass communications process in terms of source, message, medium, context, audience, and response. Required for the M.A. degree.

275. Seminar in Mass Communications Research.

Theory and techniques of mass communications research methods. Required for the M.A. degree.

281. Laws of Mass Communications.

Prerequisite: graduate standing or consent of instructor. Basic laws affecting the press; sedition; special laws on broadcasting; legal aspects of freedom of information. Required for the M.A. and M.J. degrees.

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 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 (INTERDEPARTMENTAL)****Curriculum in Latin American Studies**

For details of the curriculum leading to the degree of Bachelor of Arts, see page 82. of this bulletin.

Master of Arts in Latin American Studies

Committee in charge. James W. Wilkie, History (Chairman); John E. Englekirk, Spanish and Portuguese; Johannes Wilbert, Anthropology.

The interdepartmental program leading to the degree of Master of Arts in Latin American Studies is designed to provide systematic

advanced training for (1) students who have academic interest in Latin America; (2) students who have theoretical or methodological training for which they wish to add a Latin American component; and (3) students who plan to enter teaching, business, government, or international agency service.

Requirements for the Master's Degree

General Requirements. See pages 148-149.

Preparation. The B.A. degree in Latin American Studies or the equivalent constitutes the normal basis for admission.

Plans. The comprehensive exam plan is followed, but in exceptional cases a student may write a thesis.

Comprehensive Examination Plan. A minimum of nine courses, spread equally between three disciplines (including five graduate courses, with at least one falling in each discipline). Students prepare for the examination by developing a graduate research paper in consultation with a professor in each of three disciplines, one professor of whom shall be the chairman under whose direction the paper is prepared in a seminar, topics course, or certain Special Courses.† These professors form the examining committee charged with testing the candidate's ability to relate knowledge across disciplinary boundaries. In determining the result of the examination they will take into consideration the candidate's (a) research paper; and (b) oral defense of his investigation and its implications; as well as (c) the rationale and record of his course work for the M.A.

Thesis Plan. (Nine Courses) (a) Five courses (including three graduate courses) in one discipline which constitutes the major; and (b) two courses each in two minor disciplines (including one graduate course in each field). An interdisciplinary thesis is written under the direction of a faculty member in the major, with approval also required by one professor in each minor field.

Professional Fields: (1) The M.A. program in Latin American Studies permits students to take Library Service courses (223 or 224 and 596 as well as Latin American Studies 200) as one of their three fields under the comprehensive M.A. plan. Upon acceptance to the School of Library Service, students with an M.A. in Latin American Studies will not only have met that School's academic specialization requirement, but they may complete their professional studies in Library Science with only one additional year of study to complete the M.L.S. degree. (2) The M.A. program in Latin American Studies permits students to emphasize Education as one of their three fields. In such cases, for the comprehensive examination plan, Education 204A, 204D, and 253D are required. If the thesis plan is approved, these students must complete Education 200B, 203A, 204D, and 253D. (3) The M.A. program in Latin American Studies allows students to emphasize Public Administration as one of their three fields. Although this field is administered by the Department of Political Science, it is es-

entially interdisciplinary in nature, and may be counted as a separate field.

Other professional fields in the major include (4) Architecture and Urban Planning; (5) Engineering; (6) Law; (7) Management; and (8) Public Health.

Field Requirements. At least one of the required three disciplines must fall in the social sciences (Anthropology, Economics, Geography, History, Political Science, or Sociology).

Language Requirements: Proficiency equivalent to (a) Spanish 25 and Portuguese 3 or (b) Portuguese 25 and Spanish 5. Because these courses do not count toward the M.A. degree, students are encouraged to pass these proficiency levels by examination. In certain cases a major Indian language may be substituted for either Spanish or Portuguese.

Course Limitations. (1) Students may include only two independent study and research courses (596, 597, 598)† in their program. (2) Selection of courses is dictated by the Center's List of Approved Latin American Courses, except that the following are not applicable: language courses (in contrast to linguistic and literature§ courses;) and Special Courses, except by petition.† (3) Courses on folklore in the Spanish and Folklore Departments are counted as belonging to the same field.

Time Limitation on Enrollment. All work for the M.A. degree must be completed in five consecutive quarters (including summer), except that candidates doing field work must complete their thesis in six consecutive quarters. Because of enrollment quotas, students are expected to integrate thesis and examination studies into seminar, topic, and independent study courses.

Graduate Courses

200. Latin American Research Resources.

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

† Special courses such as 597, 598, 599, and any courses which occasionally have Latin American content (for example, Political Science 139, etc.) may be counted toward the degree by petition in which the student agrees to write a paper on a Latin American topic. In regard to these petitions, students are encouraged especially to relate theoretical or methodological courses in the various disciplines to the study of Latin America.

§ Linguistics and Literature courses may be counted in the nine required courses, except for Spanish 160B.

required for future bibliographic and research sophistication as the basis for enhanced research results. Mr. Lauerhass

250A-250B. Interdisciplinary Seminar 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. The Staff

M250C. Latin American Education.

(Same as Education M253D.) Mr. LaBelle

List of Approved Courses

LINGUISTICS COURSES

Indigenous Languages

118A-118B-118C. Elementary Quechua

Linguistics

220G. Linguistic Areas: Aboriginal (South America)

225F. Linguistic Structures: Uto-Aztecans

225T. Linguistic Structures: Mayan

Portuguese

M118. History of the Portuguese and Spanish Languages (Same as Spanish M118)

M203A-203B. Development of the Portuguese and Spanish Languages (Same as Spanish M203A-203B)

Spanish

M118. History of the Portuguese and Spanish Languages (Same as Portuguese M118.)

M203A-203B. Development of the Spanish and Portuguese Languages (Same as Portuguese M203A-M203B.)

209. Dialectology

256A. Studies in Linguistics

256B. Studies in Dialectology

LITERATURE COURSES

Portuguese

**M44. Civilization of Spanish America and Brazil

121A-121B. Survey of Brazilian Literature

127. Colonial Brazilian Literature

129. Romanticism in Brazil

135. Naturalism, Realism, and Parnasianism in Brazil

243A. Colonial Literature

243B. 19th Century Literature

243C. 20th Century Literature

M249. Hispanic Folk Literature

253A. Special Studies in Portuguese Literature: The Novel

253B. Special Studies in Portuguese Literature: The Poetry

253C. Special Studies in Portuguese Literature: The Theater

253D. Special Studies in Portuguese Literature: The Short Story and Essay

Spanish

**M44. Civilization of Spanish America and Brazil

121A-121B. Survey of Spanish American Literature

137. The Literature of Colonial Spanish America

139. 19th Century Spanish American Literature

141. Mexican Literature

143. Spanish American Literature in the 20th Century

M149. Folk Literature of the Hispanic World (Same as Folklore M149)

151. Folk Song in Spain and Spanish America

**160B. Spanish American and Brazilian Literature (not applicable to B.A. if major concentration is in Literature)

200. Bibliography

237. Chroniclers of the Americas

239. Neo-Classical 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

M249. Hispanic Folk Literature (Same as Folklore M249 and Portuguese M249.)

277. Studies in Colonial Spanish American Literature

278. Studies in 19th Century Spanish American Literature

280A. Studies in Contemporary Spanish American Literature: Modernist Poetry

280B. Studies in Contemporary Spanish American Literature: Post-Modernist Poetry

280C. Studies in Contemporary Spanish American Literature: Novel and Short Story

280D. Studies in Contemporary Spanish American Literature: The Essay

M286B. Studies in Hispanic Folk Literature: Narrative and Drama (Same as Folklore M286B.)

M286C. Studies in Hispanic Folk Literature: Ballad, Poetry, and Speech (Same as Folklore M286C.)

** Courses not applicable to the M.A. degree.

AREA COURSES

Anthropology

- 105A. Peoples of South America
- 105B. Peoples of Middle America
- 105C. Latin American Societies
- 123C. Ancient Civilizations of Western Middle America (Nahuatl Sphere)
- 123D. Ancient Civilizations of Eastern Middle America (Maya Sphere)
- 123E. Ancient Civilizations of Andean South America
- 207. Indians of South America
- 212. Anthropological Linguistics
- 252. Selected Topics in Higher Cultures of Nuclear America
- 257. Indians of South America
- 259B. Contemporary Latin American Problems.
- 286. Selected Topics in Historical Reconstruction and Archaeology
- 287. Selected Topics in Prehistoric Non-agricultural Societies
- 289. Selected Topics in Prehistoric Civilization of the New World
- †291. Analysis of Field Data

Architecture and Urban Planning†

- 212. Urbanization and National Development

Art

- 118B. The Arts of Pre-Columbian America
- 220. The Arts of Africa, Oceania and Pre-Columbian America

Dance

- **71J. Dance of Mexico (½ course)
- 146. Dance in Latin America
- 147. Dance in Indian Cultures of Americas
- 171J. Dance of Mexico (½ course)

Economics

- 110. Economic Problems of Underdeveloped Countries
- 111. Theories of Economic Growth and Development
- 112. Policies for Economic Development
- 211. Economic Growth: Measurement and Theory
- 212. Economic Development of Underdeveloped Areas: Theory and Policy
- 213. Selected Problems of Underdeveloped Areas

Education

- 200B. Survey Research Methods in Education
- 203. Anthropology and Education

204A. Comparative Education

204D. Latin American Education

- M253D. Seminar: Latin American Education (Same as Latin American Studies M250C.)

Engineering†

- 104C–104D. Experimental Engineering

Folklore

- M149. Folk Literature of the Hispanic World (Same as Spanish M149)
- 248. Theory and Method in Latin American Studies
- M249. Hispanic Folk Literature (Same as Spanish M249 and Portuguese M249.)
- M286B. Studies in Hispanic Folk Literature: Narrative and Drama (Same as Spanish M286B.)
- M286C. Studies in Hispanic Folk Literature: Ballad, Poetry, and Speech (Same as Spanish M286C.)

Geography

- **25. Proseminar in Selected Topics Relating to Man-Land Relationships
- 121. Conservation of Resources: Underdeveloped World
- 181. Middle America
- 182A. Spanish South America
- 281. Latin America
- 290B. Seminar: Middle America
- 290C. Seminar: South America
- 292. Seminar: Humid Tropics

History

- **8. Latin America: Reform or Revolution
- 162A. Latin America in the 19th Century
- 162B. Latin America in the 20th Century
- 163A–163B. The History of Brazil
- 166. The Mexican Revolution since 1910
- 168A–168B. Colonial Latin America
- 169. Latin American International Relations Since Independence
- 197. Undergraduate Colloquia: Latin America
- 230I. Advanced Historiography: Latin America
- 240I. Topics in History: Latin America
- 266A–266H. (Seminars in Latin American History) (See page 350)

Latin American Studies

- 200. Latin American Research Resources
- 250A–250B. Interdisciplinary Seminar in Latin American Studies
- M250C. Latin American Education (Same as Education M253D.)

** Courses not applicable to the M.A. degree.

† Special course. (See note on page 368)

Law

223. Law and Development in Latin America

Library Services†

223. Literature of the Social Sciences
224. Literature of the Humanities and Fine Arts

Management†

- 115A. Business Statistics
115D. Statistical Forecasting Techniques
115E. Statistical Survey Techniques
115F. Statistical Experiment Techniques
116A-116B. Statistical Methods
163. Advertising Principles and Policies
202A. Economic Policy and Business Environment
205A. International Business Economics
205B. Comparative Market Structure and Competition
205C. Business Forecasting for Foreign Economies
208. Selected Topics in Business Economics
233A. International Business Finance
261B. International Marketing Management
278A. Housing Economics
278B. Housing Policy
279A. Comparative and International Urban Land Studies
286. Field Studies in Socio-Technical Systems
292A. Environmental Settings of Socio-Technical Systems
296. International Business Management
297A. Comparative and International Management
297B. International Business Policy
298B. Special Topics in International and Comparative Management

Music

- 71J. Music and Dance of Mexico. (% course)
131A-131B. Music of Hispanic America
157. Music of Brazil
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
†146. Political Behavior Analysis

- 163A-163B. Government and Politics of Latin America

- †169. Special Studies in Comparative Government
†180. State and Local Government
†181. The Politics of Federal Bureaucracy
†182A. Metropolitan Area Government and Politics
†182B. City Government and Politics
†183. Administration of International Agencies and Programs
†185. Public Personnel Administration
†186. National Policy and Administration
†187. Law and Administration
†188A. Comparative Public Administration
†188B. Comparative Urban Government
†189. Special Studies in Public Administration
†190. Theories of Organization
†191. Urban and Regional Planning and Development
197B. Undergraduate Proseminar: Latin America
†218A. Public Administration and Local Government
†224A. Quantitative Applications
†225A. Studies in Comparative Politics
†229. Urban Government
†230. Comparative Development Administration
250A. Seminar in Regional and Area Political Studies: Latin America
†256. Seminar in Comparative Government

Public Health†

161. Demography
202A. Governmental Health Services and Trends
211A-211D. Advanced Nutrition
216A. Infectious Diseases in Tropical Regions
233. Change Determinants in Health-Related Behavior
239A-239B. Statistical Methods in Clinical Trials and Medical Surveys
245B. Advanced Research Methods in Community Health
M249A-249B. Sociocultural Aspects of Health and Illness (Same as Sociology M249A-M249B.)
252. Seminar in Community Mental Health
266B. Seminar in Infectious and Tropical Diseases
284. Seminar in Nutrition
286. Nutritional Problems in Developing Areas
290E. Special Group Studies: Population, Family and International Health

† Special course. (See note on page 368)

•• Courses not applicable to the M.A. degree.

290L. Public Health Nutrition
290Q. Infectious and Tropical Diseases

Sociology

131. Latin American Societies

193. Race and Class in Brazil

Theatre Arts

106C. History of African, Asian, and South American Film

■ 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., J.D., *Professor of Law.*

George P. Fletcher, B.A., J.D., M.C.L., *Professor of Law.*

Kenneth W. Graham, Jr., B.A., J.D., *Professor of Law.*

Donald G. Hagan, 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.*

William A. Klein, A.B., LL.B., *Professor of Law.*

Leon Letwin, Ph.B., LL.B., LL.M., *Professor of Law.*

Wesley J. Liebler, 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.*

Ralph S. Rice, B.S., J.D., LL.M., *Connell Professor of Law.*

Arthur I. Rosett, B.A., LL.B., *Professor of Law.*

Murray L. Schwartz, B.S., LL.B., *Professor of Law (Chairman of the Department).*

James D. Sumner, Jr., A.B., LL.B., LL.M., 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., J.S.D., *Emeritus Connell Professor of Law.*

Harold E. Verrall, A.B., LL.B., M.A., J.S.D., *Emeritus Professor of Law.*



Reginald H. Alleyne, Jr., B.S., LL.B., LL.M., *Acting Professor of Law.*

David A. Binder, A.B., LL.B., *Acting Professor of Law.*

Reid Peyton Chambers, B.A., M.A., J.D., *Acting Professor of Law.*

James E. Krier, B.S., J.D., *Acting Professor of Law.*

Henry W. McGee, Jr., B.S., J.D., LL.M., *Acting Professor of Law.*

Joel Rabinovitz, A.B., LL.B., *Acting Professor of Law.*

Michael Rappaport, B.S., J.D., *Lecturer in Law.*

Barbara B. Brudno, B.A., M.A., J.D., *Acting Professor of Law.*

Gary T. Schwartz, B.A., J.D., *Acting Professor of Law.*

Laurens H. Silver, B.A., J.D., *Lecturer in Law.*

Fred L. Slaughter, B.S., M.B.A., J.D., *Lecturer in Law.*

—, *Lecturer in Law.*

John M. Suarez, M.D., *Assistant Professor of Psychiatry.*
 Edmund C. Ursin, A.B., J.D., *Acting Professor of Law.*

■ LIBRARY SERVICE

(Department Office, 120 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., H.H.D., *Emeritus Professor of Library Service.*
 Raymund F. Wood, Ph.D., *Associate Professor of Library Service.*
 Robert L. Brubaker, M.A., *Assistant Professor of Library Service.*
 Kelley L. Cartwright, M.L.S., *Assistant Professor of Library Service.*
 G. Edward Evans, Ph.D., *Assistant Professor of Library Service.*



Elizabeth R. Baughman, M.A., *Lecturer in 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.*
 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

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 degree and certificate requirements, 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.

Professional internship courses. 490-series. Consent of the Dean is prerequisite to admission to all 490-series internships.

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 all 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 biblio-

graphical 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, Edsall, Bowers, Stevenson, Hinman, 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, biographical 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/1. 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.

441. 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.

443. 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.

444. 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.

445. 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

596. 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.

■ LINGUISTICS

(Office, 1387 Graduate School of Management 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.*

*Raimo A. Anttila, Ph.D., *Associate Professor of Indo-European and General Linguistics.*

Victoria A. Fromkin, Ph.D., *Associate Professor of Linguistics.*

George D. Bedell, Ph.D., *Assistant Professor of Linguistics.*

Karen Courtenay, Ph.D., *Assistant Professor of Linguistics and African Languages.*

Joseph Emonds, Ph.D., *Assistant Professor of Linguistics.*

*Talmy Givón, Ph.D., *Assistant Professor of Linguistics and African Languages.*

Sandra A. Thompson, Ph.D., *Assistant Professor of Linguistics.*

*Theo Vennemann, Ph.D., *Assistant Professor of Linguistics.*



Martin Kay, M.A., *Lecturer in Linguistics.*

Charles H. Kraft, Ph.D., *Lecturer in Linguistics and African Languages.*

Alosi Moloi, M.A., *Acting Assistant Professor of African Languages and Literature*

Benji Wald, M.A., *Acting Assistant Professor of Linguistics.*



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 G. Chapman, Ph.D., *Professor of Scandinavian Languages.*

Walter J. Dowling, Ph.D., *Assistant Professor of Psychology.*

Michael S. Flier, Ph.D., *Assistant Professor of Slavic Languages.*

Sandra J. Garcia, Ph.D., *Assistant Professor of English in Residence.*

Evelyn R. Hatch, Ph.D., *Assistant Professor of English.*

Harry Hoiyer, Ph.D., *Emeritus Professor of Anthropology.*

Wolf Leslau, Docteur-ès-Lettres, *Professor of Hebrew and Semitic Linguistics.*

Bengt Löfstedt, Ph.D., *Professor of Medieval Latin.*

* Absent on leave, 1972-1973.

- Donald G. MacKay, Ph.D., *Assistant Professor of Psychology.*
 Marlys McClaran, M.A., *Lecturer in Anthropology.*
 Lois McIntosh, Ph.D., *Professor of English.*
 John W. Oller, Jr., Ph.D., *Assistant Professor of English.*
 C. P. Otero, Ph.D., *Professor of Spanish and Romance Linguistics.*
 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.*
 Riley B. Smith, M.A., *Acting Assistant Professor of English.*
 Andreas Tietze, Ph.D., *Professor of Turkish.*
 Terence H. Wilbur, Ph.D., *Assistant Professor of German.*
 Robert Wilson, Ph.D., *Associate Professor of English.*
 Dean S. Worth, Ph.D., *Professor of Slavic Languages.*
 Gerta H. Worth, Ph.D., *Professor of Slavic Languages.*

The Undergraduate Major in Linguistics

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 or graduate courses which must include Linguistics 100, 103, 110, 120A, 120B, 160, 195, and either 170 or Anthropology 146; the other four courses are "linguistic electives," to be selected by the student subject to the approval of his adviser. Three of these may include upper division courses relative to language in any department; these courses have typically been selected from the following list, though it is not exhaustive: Linguistics 125, 140, 145, M150, 161A, 161B, 161C, 170, 180, 199 (if four units), African Languages 190, Anthropology 146, Indo-European Studies 160, 161, 162, Philosophy 127A, 127B, 192, Psychology 122, 123, Speech 103, 104, English 121, 122, 123; or advanced courses in a foreign language or literature (those beyond the sixth quarter of language instruction). In addition to the

eleven upper division courses, at least three courses (which may be either upper or lower division) are required in a language other than those in the Romance, Slavic, or Germanic families. These courses may be applied toward fulfillment of the foreign language requirement described above under *Preparation for the Major*. A student who completes an advanced language course is considered to have completed the equivalent of whatever courses are prerequisite to that one: e.g., if he completes French 101, he has automatically satisfied the requirement of the sixth quarter of work in one language. It is strongly recommended that students planning to pursue graduate work in linguistics take 161A-B.

Linguistics 195 is the course in which the student writes his Senior Essay. It may be taken during any of the student's last three quarters. The Senior Essay is a term paper written on a linguistic topic of interest to the student under the guidance of a faculty member, who usually is, but need not be, in the Department of Linguistics. To enroll in 195, the student must consult with the department's Senior Essay Counselor.

The Undergraduate Major in African Languages

Preparation for the Major. In the lower division, in addition to the general University requirements, the student must complete six courses in African Languages (101-143, 199), not fewer than three in any one language.

Requirements for the Major. A minimum of fifteen upper division courses which must include six additional courses in African languages, at least six courses in all being in one language (e.g., three counting as preparation,

three further counting as requirements for the major); African Languages 150A, 150B, 190, 192, Linguistics 100, 103; and three courses selected from Anthropology 107A, 107B, 146, English 114, 123, Geography 189, History 125A, 125B, 125C, 126A, 126B, 127A, 127B, 128A, 128B, Linguistics 110, 120A, 120B, 140, 170, Music 143A, 143B, Political Science 166A, 166B, 166C, 166D. Completion of the sixth quarter in one of the following non-African languages is strongly recommended: French, Dutch-Flemish-Afrikaans, German, Portuguese, Arabic. Also recommended: three additional courses in African languages.

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, 103, 110, and 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 examina-

tion, described below. Courses taken in preparation for the examinations will vary considerably, depending on the prior preparation of the student; they are selected in close consultation with a graduate adviser of the department.

The areas of the comprehensive examinations are (1) Phonological Theory, (2) Syntactic Theory, (3) Historical Linguistics, (4) Linguistic Analysis/Problem Solving, and (5) an "elected" area chosen by the student. Instead of the fourth area, a language-specific historical/comparative specialization (described below) may be chosen, provided that the student is going on to specialize in that area for the doctorate.

Available courses in preparation for each area are the following:

Phonology: 103, 120A, 161A, 200A, 200B, 200C.

Syntax: 120B, 161B, 205A, 205B, 205C.

Historical: 110, 202A-202B-202C.

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 200C 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 202C fairly early; similarly, for psycholinguistics, Psychology 123; for computational linguistics, 240A-B; 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: Professor Tietze). The courses in the language specialization are normally selected from the following lists: for Ancient Indo-European: IES 210 and three courses from IES 220A, 220B, English 216A, 217A, Greek 242A, 242B, Latin 242A, 242B, Oriental Languages M222A, Persian 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 industry, 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, however, for all candidates: 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 by the department, 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. Three outside essays on specified topics in phonology, syntax, and historical linguistics.

2. 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.

3. An outside essay in any of the special fields of the doctoral examinations, or in historical/comparative linguistics, or in phonology, or syntax.

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, and to have completed at least two quarters of supervised field work for which 210A-210B may serve. 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 ethnolinguistics, 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 Indigenous Languages of Latin America offers instruction in Quechua. 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, for the general undergraduate, 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.

Mrs. Fromkin, Mr. Ladefoged, Mrs. Thompson

2. Linguistics and Minority Dialects.

Prerequisite: course 1 or consent of the instructor. 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.

Mrs. Garcia, Mr. Wald

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. Intended as the first course in the major, though not restricted to majors. 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.

Mrs. Fromkin, Mr. Ladefoged

110. Introduction to Historical Linguistics.

Prerequisite: courses 100 and 103. 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. Vennemann, Mr. Wehners

120A. Linguistic Analysis: Phonology.

Prerequisite: courses 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, Mr. Schachter

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, Mr. Given

*125. Cybernetics and Human Communication.

An introductory survey of the communication process from the point of view of linguistics, mathematics, engineering, physiology, and psychology.

Mrs. Fromkin, Mr. Ladefoged

140. Linguistics in Relation to Language Teaching.

Prerequisite: course 100. Aspects of linguistics in relation to the teaching of language with particular focus on the special problems entailed in the teaching of non-European languages.

Mr. Kraft, Mr. Stockwell

145. Introduction to Computation in Linguistics.

Prerequisite: courses 100, 120A-120B. Introduction to the uses to which computers are put in linguistics and to such applications as mechanical translation and information retrieval; development of basic familiarity with programming and programming languages for linguistics purposes.

Mr. Kay

M150. Introduction to Indo-European Linguistics.

(Same as Indo-European Studies M150.) 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. Fuhvel

160. History of Linguistics Through the 19th Century.

Prerequisite: courses 120A-120B. Historical survey of the development of linguistics from Pānini 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. Bedell, 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, Mr. Schachter

161C. Survey of Transformational Theories.

Prerequisite: course 120B. Problems and alternatives from the Aspects model to the present.

Mr. Emonds

170. Language and Society: Introduction to Sociolinguistics.

Prerequisite: course 100 or consent of the instructor. Study of the patterned covariation of language and society; social dialects and social styles in language; problems of multilingual 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.

Miss Ball, Mr. Emonds, Mr. Kay

* Not to be given 1972-1973.

195. Senior Essay.

Prerequisite: consent of instructor; open only to Linguistics majors in their senior year. An extended piece of writing will be undertaken on a linguistic topic selected by the student to be completed under the supervision of a member of the faculty in Linguistics (either Linguistics Department or, as appropriate, some faculty of other departments). To enroll in this course the student must consult the professor in charge. Mr. Kraft in charge

199. Special Studies in Linguistics. (½ or 1 course)

Prerequisite: courses 120A, 120B, and consent of instructor. May be repeated for credit. The Staff

Graduate Courses**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. Vennemann

200B. Phonological Theory II.

Prerequisite: course 200A. Continuation of course 200A. Mr. Bedell, Mrs. Fromkin, Mr. Vennemann

200C. Phonological Theory: Experimental Bases.

Prerequisite: course 200A. Theory and practice, control and measurement encountered in experimental research in speech. Mrs. Fromkin, Mr. Ladefoged

202A. Linguistic Change: Phonology.

Prerequisite: course 110. Advanced study of the theory of phonological change and its applications to comparative and internal reconstruction.

Mr. Anttila, Mr. Vennemann, Mr. Welmers

202B. Linguistic Change: Morphosyntax

Prerequisite: course 202A. Advanced study of the theory of morphological and syntactic change and its applications to comparative and internal reconstruction.

Mr. Anttila, Mr. Stockwell, Mr. Vennemann

202C. Linguistic Variation: Dialectology.

Prerequisite: course 110; 170 recommended. Advanced study of social and areal dialect variation and their relevance to linguistic change. Mr. Wald

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. Edmonds, Mr. Schachter, Mrs. Thompson

205C. Grammatical Theory III.

Prerequisite: course 205B. Current issues in grammatical theory. Mr. Edmonds, Mr. Schachter

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. Givón, Mr. Schachter

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. Givón, Mr. Schachter

220A-220H. 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.

225A-225W. 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. 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.

*225U. Persian Phonology and Syntax.

*225V. Persian Syntax.

Prerequisite: course 225U.

*225W. Chadic.

240A. Computational Linguistics I.

Introduction to digital computers, algorithms and programming of linguistic tasks. Topics selected

* Not to be given 1972-1973.

from dictionary maintenance and lookup, sentence generation and analysis, concordance construction, question answering, mechanical translation, etc.

Mr. Kay

240B. Computational Linguistics II.

Prerequisite: course 240A. Continuation of 240A.

Mr. Kay

Seminars (numbered 250 and above) may be repeated for credit, having been approved by the Graduate Council as nonrepetitive in content.

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 200B. Problems in grammatical and lexical theory and in the analysis of a variety of languages.

The Staff

250C. Topics in Linguistic Theory. Seminar.

Prerequisite: consent of the instructor. The meta-theory of language description and the history of linguistic theory.

The Staff

255A. Acoustic Phonetics. Seminar.

Prerequisite: course 200C.

Mrs. Fromkin, Mr. Ladefoged

255B. General Phonetics. Seminar.

Prerequisite: course 200A.

Mrs. Fromkin, Mr. Ladefoged

255C. Physiological Phonetics. Seminar.

Prerequisite: course 200A.

Mrs. Fromkin, Mr. Ladefoged

265. Sociolinguistics. Seminar.

Prerequisite: course 170 or consent of instructor.

Mr. Bright, Mr. Wald.

*270A. Historical Linguistics I. Seminar.

Prerequisite: course 202A-202B. Course 270B is normally post-requisite of 270A. Problems in the use of the comparative method in historical linguistics

Mr. Anttila, Mr. Vennemann

270B. Historical Linguistics II. Seminar.

Prerequisite: course 270A in the preceding quarter. Problems in the internal reconstruction of the history of languages.

Mr. Anttila, Mr. Vennemann

Individual Study and Research

596A. 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

596B. 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

* Not to be given 1972-1973.

597. 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

599. 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.

Miss Ball

102A-102B-102C. Intermediate Swahili.

Five hours. Prerequisite: courses 101A-101B-101C or consent of the instructor.

Miss Ball

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.

Miss Ball

*104A-104B-104C. Elementary Luganda.

Five hours. A major language of Uganda.

Mr. Givón

*105A-105B-105C. Elementary Sotho.

Five hours. Southern Sotho, spoken primarily in Basutoland and Orange Free State, mutually intelligible with adjacent Northern Sotho and Tswana.

Mr. Moloi

*106A-106B-106C. Intermediate Sotho

Five hours. Prerequisite: courses 105A-105B-105C or consent of instructor.

Mr. Moloi

107A-107B-107C. Elementary Zulu.

Five hours. The most widely spoken of the Nguni languages of South Africa, mutually intelligible with other members of this group.

Mr. Moloi

*108A-108B-108C. Intermediate Zulu.

Five hours. Prerequisite: courses 107A-107B-107C or consent of instructor.

Mr. Moloi

*109A-109B-109C. Elementary Xhosa.

Five hours. A major Nguni language of South Africa, mutually intelligible with other members of this group.

Mr. Moloi

*110A-110B-110C. Intermediate Xhosa.

Five hours. Prerequisite: courses 109A-109B-109C or consent of the instructor.

Mr. Moloi

111A-111B-111C. Elementary Yoruba.

Five hours. Prerequisite: consent of the instructor. The major language of western Nigeria.

Ms. Courtenay

112A-112B-112C. Intermediate Yoruba.

Five hours. Prerequisite: courses 111A-111B-111C or consent of the instructor. Ms. Courtenay

***113A-113B-113C. Elementary Igbo.**

Five hours. The major language of eastern Nigeria. Mr. Welmers

***114A-114B-114C. Intermediate Igbo.**

Five hours. Prerequisite: courses 113A-113B-113C or consent of the instructor. Mr. Welmers

***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. Prerequisite: consent of the instructor. 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

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. Mr. Molo

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 Senfo. 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.**

Prerequisite: 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-202C. Comparative Bantu.**

Prerequisite: Linguistics 202A, 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.

Mr. Molo

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

Indigenous Languages of Latin America**Upper Division Courses****118A-118B-118C. Elementary Quechua.**

Five hours. The language of the Incas and its present day dialects, as spoken in Andean South America. Miss McClaran

South Asian Languages**Upper Division Courses****151A-151B-151C. Elementary Thai.**

Five hours. The major language of Thailand. Mr. Campbell

***152-152B-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, Mr. Wilson

171A-171B-171C. Hindi.

Five hours.

Mr. Bright

Related Courses in Other Departments**(Other than Language Courses)**

Anthropology 146. Language in Culture.

276. Ethnolinguistics. Seminar.

* Not to be given 1972-1973.

- Indo-European Studies (Department of Classics)** 210. Indo-European Linguistics: Advanced Course.
280A-280B. Seminar in Indo-European Linguistics.
- English** 121. The History of the English Language.
122. Introduction to the Structure of Present-day English.
210. History of the English Language.
215. The Structure of Present-day English.
218. Celtic Linguistics.
241A. Historical English Grammar. Seminar.
241B. Modern English Grammar. Seminar.
250K. Contrastive Analysis of English and Other Languages. Seminar.
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.
- 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.
231. Seminar in Language and Communication.
260A. Psycholinguistics I. Seminar.
260B. Psycholinguistics II. Seminar.
- Slavic Languages** 202. Introduction to Comparative Slavic Linguistics.
242. 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.
M118. History of the Portuguese and Spanish Languages.
203A-203B. The Development of the Portuguese and Spanish Languages.
204A-204B. Transformational Grammar.
206. Linguistics.
209. Dialectology.
M251. Studies in Galegan-Portuguese and Old Spanish.
256A-256B. Studies in Linguistics and Dialectology.
- Portuguese (Department of Spanish and Portuguese)** M203A-203B. The Development of the Portuguese and Spanish Languages.
- Speech** 102. Background and Theories of Oral Communication.
103. Phonetics of English.
104. Science of Speech.

■ MANAGEMENT

(Department Office, 3250 Graduate School of Management)

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 Planning.*

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.*

Louis E. Davis, M.S., *Professor of Organizational Sciences and Research Socio-Technical Scientist.*

David K. Eiteman, Ph.D., *Professor of Finance.*

Hy Faine, J.D., *Adjunct Professor of Arts Management.*

Arthur M. Geoffrion, Ph.D., *Professor of Operations Research.*

John E. Hutchinson, Ph.D., *Professor of Industrial Relations and Research Political Scientist, Institute of Industrial Relations.*

James R. Jackson, Ph.D., *Professor of Organization Science.*

Neil H. Jacoby, Ph.D., LL.D., *Armand Hammer Professor of Business Economics and Policy.*

Raymond J. Jessen, Ph.D., *Professor of Business Statistics, and Professor of Public Health.*

Harold H. Kassarian, Ph.D., *Professor of Management.*

Erwin M. Keithley, Ed.D., *Professor of Management.*

Paul Kircher, Ph.D., C.P.A., *Professor of Accounting and Information Systems.*

Harold Koontz, Ph.D., *Mead Johnson Professor of Management.*

James B. MacQueen, Ph.D., *Professor of Management.*

Frederic Myers, Ph.D., *Professor of Industrial Relations and Research Economist, Institute of Industrial Relations.*

Irving Pfeffer, Ph.D., *Professor of Insurance.*

Barry M. Richman, Ph.D., *Professor of Management and International Business.*

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 Computer and Information Systems.*

George A. Steiner, Ph.D., Litt.D., *Professor of Management and Public Policy.*

Robert Tannenbaum, Ph.D., *Professor of the Development of Human Systems.*

J. Fred Weston, Ph.D., *Professor of Finance and Business Economics.*

Harold M. Williams, J.D., *Professor of Management.*

Robert M. Williams, Ph.D., *Professor of Business Economics and Statistics.*

Ralph M. Barnes, Ph.D., *Emeritus Professor of Production Management and Engineering and Applied Science.*

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., LL.D., *Emeritus Professor of Accounting.*

Leo Grebler, Ph.D., *Emeritus Professor of Urban Land Economics.*

Ralph C. Hoeber, J.D., Ph.D., *Emeritus Professor of Business Law.*

Wilbert E. Karrenbrock, Ph.D., *Emeritus Professor of Accounting.*

*Jacob Marschak, Ph.D., *Emeritus Professor of Operations Research and Economics.*

• Recalled to active service.

- Wayne L. McNaughton, Ph.D., *Emeritus Professor of Management.*
- Cyril J. O'Donnell, Ph.D., *Emeritus Professor of Business Organization and Policy.*
- George W. Robbins, M.B.A., *Emeritus Professor of Marketing.*
- Theodore A. Andersen, Ph.D., *Associate Professor of Business Economics and Finance.*
- Robert B. Andrews, Ph.D., *Associate Professor of Management.*
- John W. Buckley, D.B.A., *Associate Professor of Accounting and Information Systems.*
- Walter A. Fogel, Ph.D., *Associate Professor of Industrial Relations, and Associate Research Economist, Institute of Industrial Relations.*
- Richard A. Goodman, D.B.A., *Associate Professor of Management.*
- Glenn W. Graves, Ph.D., *Associate Professor of Quantitative Methods.*
- Alfred E. Hofflander, Ph.D., *Associate Professor of Finance and Insurance.*
- Archie Kleingartner, Ph.D., *Associate Professor of Industrial Relations, and Associate Research Economist, Institute of Industrial Relations.*
- Steven A. Lippman, Ph.D., *Associate Professor of Quantitative Methods.*
- Robert Hal Mason, Ph.D., *Associate Professor of International Business and Business Policy.*
- Fred Massarik, Ph.D., *Associate Professor of Behavioral Science and Industrial Relations, and Associate Research Behavioral Scientist, Institute of Industrial Relations.*
- William W. McKelvey, Ph.D., *Associate Professor of Organization Science.*
- William H. McWhinney, Ph.D., *Associate Professor of Organizational Behavior.*
- Frank G. Mittelbach, M.A., *Associate Professor of Management and Associate Research Economist.*
- Rosser T. Nelson, Ph.D., *Associate Professor of Management.*
- Alfred Nicols, Ph.D., *Associate Professor of Business Economics.*
- Frank E. Norton, Ph.D., *Associate Professor of Business Economics.*
- Anthony P. Raia, Ph.D., *Associate Professor of Management.*
- R. Bruce Ricks, Ph.D., *Associate Professor of Finance.*
- Keith V. Smith, Ph.D., *Associate Professor of Finance and Business Economics.*
- Thaddeus Spratlen, Ph.D., *Associate Professor of Marketing.*
- Michael Y. Yoshino, Ph.D., *Associate Professor of Management.*
- Ichak Adizes, Ph.D., *Assistant Professor of Managerial Studies.*
- James Bettman, Ph.D., *Assistant Professor of Management.*
- John M. Burt, Jr., Ph.D., *Assistant Professor of Operations Management.*
- Michael Chatfield, D.B.A., C.P.A., *Assistant Professor of Accounting.*
- Lee G. Cooper, Ph.D., *Assistant Professor of Management.*
- Samuel A. Culbert, Ph.D., *Assistant Professor of Human Systems Development.*
- John R. Dominguez, Ph.D., *Assistant Professor of Business Economics and Finance.*
- James S. Dyer, Ph.D., *Assistant Professor of Operations Research.*
- Donald Erlenkotter, Ph.D., *Assistant Professor of Decision and Planning Sciences.*
- Maurice Goudzwaard, Ph.D., *Assistant Professor of Finance.*
- Michael E. Granfield, Ph.D., *Assistant Professor of Urban Land Economics.*
- J. Morgan Jones, Ph.D., *Assistant Professor of Operations Research.*
- Basil A. Kalymon, Ph.D., *Assistant Professor of Quantitative Methods.*
- Clement Krouse, Ph.D., *Assistant Professor of Business Economics.*
- John J. McDonough, D.B.A., *Assistant Professor of Accounting and Information Systems.*
- 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 J. Morse, Ph.D., *Assistant Professor of Organizational Behavior.*

Masao Nakanishi, Ph.D., *Assistant Professor of Management.*

David R. Peters, Ph.D., *Assistant Professor of Behavioral Science.*

Hans Schöllhammer, D.B.A., *Assistant Professor of Management Theory and International Business.*

James Taylor, *Assistant Professor in Residence of Socio-Technical Systems.*

Kenneth W. Thomas, Ph.D., *Assistant Professor of Behavioral Science.*

James Warren, Ph.D., *Assistant Professor of Finance.*

Burton Zwick, Ph.D., *Assistant Professor of Finance.*



Robert Buttrey, LL.B., C.P.A., *Lecturer in Accounting.*

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.*

Richard O. Mason, Ph.D., *Acting Associate Professor of Information Systems.*

Paul Prasow, Ph.D., *Senior Lecturer in Industrial Relations, and Associate Director, Institute of Industrial Relations.*

Donald Ratajczak, B.A., *Lecturer in Management.*

Fred Schmidt, B.A., *Senior Lecturer in Industrial Relations, and Research Economist, Institute of Industrial Relations.*

Warren H. Schmidt, Ph.D., *Senior Lecturer in Behavioral Science.*

Edward V. Sedgwick, Ph.D., *Lecturer in Management.*

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*

136. Computer Programming for Graduate Students.

Designed to provide the graduate student with a programming skill in a particular computer language (e.g., APL, FORTRAN, COBOL, JCL). The selection of the language to be taught in any given quarter will depend upon demand and available resources. May be repeated. *Mr. McLean, in charge*

Upper Division Courses

Upper division courses in management are open to all University students who have completed the necessary prerequisites.

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 180 (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

108. 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. *Mr. Buttrey and 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*

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. Computer Data Processing.

An introduction to computer data processing for students with little or no previous experience with computing. Historical background and present applications of computers are reviewed. Computer hardware and software concepts are discussed. Computing programming problems, using PL/I, are required.

Mr. McLean, Mr. Sprowls

113B. Computer Programming Methods.

Prerequisite: Course 113A or the consent of the instructor. A continuation of course 113A. Emphasis on computer programming methods, especially for business data processing. Focuses on program design, file processing, and data base considerations. Extensive use of PL/I for programming assignments. Advanced computer hardware concepts are discussed.

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

115D. 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. Jensen

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. Jensen

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. Jensen

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

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. Dominguez, Mr. Kaufman, Mr. Warren

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 Management 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

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

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

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. Laake, 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 management 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 MANAGEMENT

199. Special Studies in Management.

($\frac{1}{4}$ 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. Ratajczak

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

M203A. Economics of Decision.

(Same as Economics M203A.) 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. Erlenkotter, Mr. Marschak

M203B. Economics of Information.

(Same as Economics M203B.) Prerequisite: rudiments of economic theory of the firm, and of calculus and probabilities or statistics (e.g., course 116A); course M203A, or consent of the instructor. Optimal decision and information rules. Amount, cost and value of information. Mr. Marschak

M203C. Economics of Organization.

(Same as Economics M203C.) 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. Weston, 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

207A. Resource Administration of Nonmarket Activities.

Prerequisites: courses 401 and 406, or consent of instructor. Examination of the proper economic role of nonmarket institutions, and of the allocation of societal resources between the public and private sectors via market and nonmarket mechanisms. Definition and application of economic efficiency to resource allocations. Mr. Granfield, Mr. Ratajczak

207B. Public Services and Private Functions.

Prerequisites: courses 401, 406, or course 175, or consent of instructor. Sources and uses of federal, state, and local revenues and their impacts on public and private resource allocations. Examination of the

proper roles and the private sector in the financing and provision of public goods and services.

Mr. Granfield, Mr. Ratajczak

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. Kalymon, Mr. Lippman

M210C. Network Flows and Combinatorial Programming.

(Same as Engineering M299C.) 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. Geoffrion, 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

M211B. Large-Scale Mathematical Programming.

(Same as Engineering M299C.) 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, multidivisional, and stochastic aspects to obtain practical solution procedures in spite of large numbers of variables and/or constraints. Mr. Geoffrion, Mr. Graves

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, validation, operating procedures, and analysis of simulation experiments. Review of relevant literature. Applications of simulation to problems of business and operations research. Mr. Burt, Mr. Nelson

214D. Advanced Computer Simulation.

Prerequisite: course 214C. Advanced use of computer simulation techniques. Major term projects will be undertaken, either singly or in groups, with the object of developing in students the ability to accomplish all phases of the design and execution of computer simulation. Mr. Nelson

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, Mr. Ratajczak

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

M215F. Statistical Design of Experiments.

(Same as Engineering M275A.) 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

M216A. Queueing Systems: Theory and Applications.

(Same as Engineering M223A.) 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

M216B. Advanced Queueing Theory and Applications.

(Same as Engineering M223B.) Prerequisite: course M216A. 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 non-zero-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, Mr. MacQueen

218A. Selected Topics in Operations Research.

($\frac{1}{4}$ 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

218C. Selected Topics in Business Statistics.

($\frac{1}{4}$ 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.

($\frac{1}{4}$ 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. Practices are studied in their historical context and the formulation of accounting principles 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.

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. Operational and management auditing.

Mr. Kircher

224A. Computer Systems Analysis.

Prerequisite: course 113B or consent of instructor. Application of system analysis techniques to the design and specification of computer-based systems. Measurement, simulation, and evaluation of computer systems. Methods of costing system hardware and software and of predicting computer performance. Case examples are used.

The Staff

224B. Computer-Based Management Information Systems.

Prerequisite: course 113B or consent of the instructor. An introduction to computer-based management information systems. Focuses on the defini-

tion, evaluation, installation, and continuing management of EDP systems. The organizational impact of computer systems is stressed. Advanced concepts of management's use of the computer are introduced.
Mr. McLean

224C. Advanced Project in Computers and Information Systems.

Prerequisite: courses 224A, 224B, and 225A. A major project designed to integrate the student's previous work in computers and information systems. May involve any—or all—phases of the analysis, design, and implementation of computer-based information systems. Actual applications are stressed.
The Staff

224D. Generalized Data Base Management Systems.

Prerequisites: course 113B or consent of instructor. Examines the features and capabilities of generalized data base management systems. Includes system classification, comparison of software features, and evaluation of specific systems. Emphasis is upon management uses or such systems. A field study project may be required.
Mr. Sprowls

224E. Special Topics in Computing.

Prerequisite: consent of instructor. An examination in depth of issues or problems concerned with the theory and practice of computing and the management use of EDP systems. Course may have a single theme or may deal with a number of topics. May be repeated for credit.
The Staff

225A. Information Systems.

Design of information systems for organizations. Emphasizes systems concepts; user's requirements; methods of systems analysis; information flows; and measurement, coding, and classification of data. Utility of information systems relative to the needs of particular organizational decision and control centers.
Mr. Mason

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. McDonough, 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 consideration.
Mr. Mock

225D. Special Topics in Information 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 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

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. 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.

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 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

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. Krouse, 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 finance, analysis of business case problems, and individual student reports of financial problems of particular corporations.

Mr. Goudzwaard, Mr. Kaufman, Mr. Warren

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. Weston

231C. Theory of Finance.

Prerequisite: courses 231A and 231B, or consent of instructor. Methodology in the development of theories of finance. Influence of assumptions on the resulting structure and implications of financial models. Empirical testing of financial models.

Mr. Shelton, Mr. Weston

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. Shelton, Mr. Warren

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. Pfeiffer

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. Pfeiffer

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. Pfeiffer

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. Pfeiffer

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. Linear Models of Operational Systems.

Prerequisite: Mathematics 11C or equivalent. The use of linear models and their extensions for the analysis of operational systems. Formulation and application of linear, network, and integer models in illustrative examples and case studies. Fundamentals of solution methods and their use in analysis.

Mr. Bettman, Mr. Dyer, Mr. Erlenkotter

240B. Nonlinear and Dynamic Models of Operational Systems.

Prerequisites: Mathematics 11C, Mgt. 240A or equivalent. The use of nonlinear and dynamic models for the analysis of operational systems. Examples of actual and potential applications to problems of managerial concern. A survey of nonlinear and dynamic programming solution techniques.

Mr. Bettman, Mr. Dyer, Mr. Erlenkotter

240C. Stochastic Models of Operational Systems.

Prerequisite: 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, Mr. Dyer, Mr. Jones

210D. Simulation of Operational Systems.

Prerequisite: Knowledge of computer programming. Introduction to the design of computer simulations and to special purpose simulation languages. Emphasis upon the managerial use of simulation, sensitivity analysis, and the use of models for policy testing. Programming assignments as well as case material will be used. The Staff

240E. 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, Mr. Erlenkotter

242A. Planning for Facilities Systems.

Prerequisite: courses 240A, 240B, or equivalent. Planning of location, expansion, and replacement for interdependent systems of facilities. Examination of spatial and dynamic economic considerations. Applications in selected industries. Mr. Erlenkotter

212B. Planning for Processes and Facilities.

Prerequisites: courses 240A, 240B, or equivalent. Planning and design for individual processes or facilities to transform inputs into desired products or services. Examination of process selection, materials 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. Kalymon, 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. 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. R. O. Mason, Mr. Taylor

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-247B. Survey of Operations Management.

Prerequisite: Enrollment in the M.S. or the Ph.D. programs. 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. Human Resource Management.**

Prerequisite: consent of instructor. First part of a two-course sequence of focusing upon the processes and problems of managing human resources. Topics include people as resources; nature of human resource management; human resource planning; designing and organizing tasks and roles; and acquiring and allocating people.

Mr. Kleingartner, Mr. Massarik

250B. Human Resource Management.

Prerequisite: course 250A. Topics include development and training; human resources accounting; behavioral foundations of participating management; motivation, productivity, and satisfaction; designing reward systems; and evaluation of organization effectiveness. Emphasis on understanding, predicting, and influencing human behavior in organizations. Mr. Kleingartner, Mr. Massarik

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. Mr. Hutchinson, Mr. Meyers, Mr. Schmidt

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. Fogel, Mr. Mitchell

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. Prasow, 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. Meyers

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. Nakanishi and The Staff

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

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

264C. Seminar in Multidimensional Scaling.

Prerequisite: Consent of instructor. A seminar providing for the study of recent developments in metric and non-metric multidimensional scaling.

Mr. Cooper

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

265B. Social Issues in Marketing.

Prerequisites: 260A or consent of instructor. Environmental impact of marketing in society; study of theories, methods and relationships for evaluating transaction behavior in a scientific and humanistic context; macroanalytic perspectives in marketing.

Mr. Spratlen

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.

The Staff

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 quarter depending on the particular interests of the instructor and students. Individual projects and reports. May be repeated for credit.

ARTS MANAGEMENT

270. Environment of the Art World.

Prerequisite: Consent of instructor. Consideration and analysis of the political, social, economic and environmental forces in American society as they affect the existence and development of Arts Institutions in the U.S. The aim is to explore present policies and trends and potential future developments.

Mr. Faime

271. Law and the Arts.

Prerequisite: Consent of instructor. Exploration of the way in which law and the arts relate, the role of the lawyer vis a vis artist and arts manager, policy underpinnings of the law and effect on the arts, and unsolved problems and issues in areas of interaction.

M272A. The Role of Management in Artistic Decision Making.

(Same as Theater Arts M290A.) A descriptive study of the criteria for decision making in artistic institutions including the role of the institution in society, the economic environment of the arts, and the artistic value systems of arts organizations.

Mr. Cauble

M272B. Programming and Planning Policies in Arts Organization.

(Same as Theater Arts M290B.) An analysis of the social, artistic and economic roles of the arts as reflected in programming policy. An examination of the social goals pursued in establishing relationships between the arts and their environment.

Mr. Cauble

URBAN LAND ECONOMICS

275A. Urban Issues & Problems.

Prerequisites: course 175 or consent of instructor. Study of urban problems and issues including demand for and supply of private and public goods, environmental pollution, transportation, recreational facilities, poverty, housing the poor, city size and efficiency, urban sprawl, taxation, new towns, real estate and building industries.

The Staff

275B. Urban Land Economics.

Prerequisites: course 175, 401 or consent of instructor. Introduction to development and use of economics and management principles in identifying and analyzing the determinants of urban land use and land values, public policies affecting the urban land market, and the private sector's role in shaping the urban environment.

The Staff

275C. Alternative Urban Futures.

Prerequisites: consent of instructor. The use of economic tools and business techniques for planning and forecasting alternative urban futures. Urban and World Dynamics models are used to analyze future urban life under various assumptions about the shape, structure, and functions of future cities.

The Staff

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

276B. Comparative and International Urban Land Studies.

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. Case, Mr. Mittelbach

276C. Urban Dynamics: Degeneration and Regeneration.

Prerequisite: consent of instructor. Seminar which identifies, analyzes and evaluates problems and solutions concerning urban blight, rehabilitation, redevelopment, new towns, inner-city revitalization and inter-governmental relations in the American city, with particular emphasis on the role of private enterprise in dealing with these problems.

Mr. Mittelbach, Mr. Ratajczak

277A. Housing Economics.

Prerequisite: consent of 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. Case, Mr. Granfield, Mr. Mittelbach

277B. Housing Policy.

Prerequisite: consent of 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. Case, Mr. Mittelbach

278A. Urban Real Estate Financing and Investing.

Prerequisites: consent of instructor. Theoretical and pragmatic analyses are used to determine the differences between real property and other investments. Real estate investment opportunities are evaluated for their effectiveness in balancing personal and business investment objectives and public land use goals.

Mr. Case

278B. Sources, Uses and Flows of Real Estate Capital.

Identification and analysis of sources and uses of real estate credit and equity funds. Policies and programs of lenders are related to real estate construction and market trends, and governmental economic and housing policies and programs.

Mr. Case, Mr. Mittelbach

279A. Special Studies in Urban Land Economics.

Open to M.S. or Ph.D. candidates working on thesis or dissertation related research. May be repeated for credit.

The Staff

279B. Selected Topics in Urban Land Economics.

Open to all graduate students who wish to pursue a particular topic in housing, real estate or urban land economics in depth on an individual or cooperative basis. May be repeated for credit.

The Staff

279X-279Y-279Z. Urban Research and Development. (½ to 1 course)

Prerequisite: consent of instructor, graduate status. Exploration of urbania and its problems; prospects and prescriptions for the delivery of a quality life. The exploration will be both macroscopic and microscopic as related to problems of a selected urban area.

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.

Mr. McKelvey, Mr. Thomas, and 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. Laske

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. Morse, Mr. Raia, Mr. Taylor

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. Massarik, 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. Culbert, Mr. Massarik, Mr. Peters

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. Raia, Mr. Tannenbaum

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 methodology 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.

Mr. Davis, Mr. McWhinney

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. McWhinney

292C. Comprehensive Planning in the Public Sector.

Prerequisite: admission to M.S. program or consent of instructor. Evolving modes of planning under complexity with particular emphasis on the public sector. Development of policy through standard setting, bargaining, and regulating governing relationships; reality and value judgments; social and technical dimensions of alternatives; and social and technological forecasting.

Mr. Andrews, Mr. Dyer, Mr. McWhinney

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. Adizes, 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. Richman, Mr. Schollhammer, Mr. Yoshino

297C. International Business Law.

Prerequisite: courses 205A and 296. Impact of different legal environments on international business operations; legal regulations governing the transfer of funds; international taxation issues; legal safeguards for intellectual property rights; foreign investment laws; international business and government relations.

The Staff

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 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 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*

INTERNATIONAL AND COMPARATIVE MANAGEMENT STUDIES

See courses 205A, 205B, 205C, 226, 233A, 255, 261B, 296, 297A, 297B, 297C, 298B.

OPERATIONS RESEARCH

See courses 111, 203A, 203B, 203C, 210A, 210B, M210C, 211A, M211B, 214C, 214D, M216A, M216B, 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, 413.

PROFESSIONAL COURSES**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*

413. Introduction to Systems.

Conceptual foundations of systems. Methods of systems analysis and synthesis. Construction and use of systems models. The role of values in systems thinking. *The Socio-Technical 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

430. Introduction to Managerial Statistics.

(½ course)

Prerequisite: Graduate status. An introduction to probability theory and classical statistics. Statistical descriptions of data. Basic concepts of probability theory. The use of sampling for decision making. Interpretation of tests of hypotheses. Overview in managerial terms of more advanced statistical methods.

The Staff

431. Introduction to Model Building. (½ course)

Prerequisite: Graduate status. An introduction to formal model building. Use of mathematical models as system descriptors. Characteristics of the major "classes" of models. Formulation of problems in terms of mathematical models. Interpretation of solutions provided by the computer.

The Staff

432A. Managerial Economics: The Firm. (¾ course)

Prerequisite: Graduate status. Study of resource allocation in market and non-market environments; role of prices in allocations and their determination via demand and supply; models of the firm in a demand-supply framework with emphasis on their use in managerial decision making.

The Staff

432B. Managerial Economics: Forecasting.

(¾ course)

Prerequisite: Graduate status. Exposition of the economic system which exists in current environment. Analyses of the interactions of economic units, their effects upon prices, output, and employment, and short and long term economic forecasting for use in managerial decision making

The Staff

433A. Computing Laboratory: I. (¼ course)

Prerequisite: Graduate status. Use of the computer as an aid in solving management related problems; interactive, time shared processing utilizing remote terminals; and the APL computer language.

The Staff

433B. Computing Laboratory: II. (¼ course)

Prerequisite: 433A. Use of the computer as an aid in solving management related problems; remote entry batch processing; and the DYNAMO II computer language.

The Staff

434. Managerial Accounting and Finance

Prerequisite: Graduate status. An introduction to the fundamentals of accounting and finance with emphasis on the preparation of basic financial statements and the techniques of financial analysis.

The Staff

435. Organizational Behavior and Management Processes.

Prerequisite: Graduate status: A system approach to the theory and practice of management in complex organizations. Provides an integrated view of human behavior and managerial processes in a dynamic organizational society.

The Staff

436. Policy and Organizational Environment.

Prerequisite: 443. Environmental settings of organizations; interrelationships among and roles of various sectors of society with special emphasis on business; issues facing managers and management-related specialists; and formulation of organizational strategies and policies.

The Staff

440. Individual Decision Making. (½ course)

Prerequisite: Graduate status. Study and practice of making individual decisions, including individual personality, motivation, decision-making techniques and interpersonal communications. Experience in the collection of data for decision-making and critique of action plans and programs to attain individual goals.

The Staff

441A-441B. Managerial Decision Making.

(½ course-½ course)

Prerequisite: Graduate status. The study and practice of organizational decision-making which centers around a computerized management game. Topics and content areas will be appropriately sequenced to correspond with the experience and development of the game.

The Staff

442. Complex Systems: Methods of Analysis.

(½ course)

Prerequisite: 433A and 440. Introduction to systems models, with emphasis on formal representations; rational approaches to decision under uncertainty, stressing fundamentals relevant to problems at all levels of complexity.

The Staff

443. Complex Systems: Problem Identification and Solution.

Prerequisite: 433B and 442. Application of whole systems thinking, computer modeling and uncertainty analyses to contemporary problems. Approaches to problem-solving, including identification, formulation, data collection, decision analysis, modeling, simulation, forecasting, assumption testing, solution methods, and implementation.

The Staff

444A-444B. Integrative Study Project.

Prerequisite: 433. Supervised study of an organization, including establishment of client organization/student consultant relationship, identification of problem to be studied, development of nature and objectives of study, design of study, collection of data, analyses of data, and development of implementable recommendations. The Staff

450. Field Work in Behavioral Science**Management Development. (1 or 2 courses)**

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.**(½ to 3 courses)**

Prerequisite: courses 282B, 283 and/or consent of the instructor. Supervised practical field work in organizational development consultation in interpersonal, group, intergroup, total organization and interorganizational settings. The Staff

452. Field Work in Technical Assistance for**Minority Business Enterprise. (¼ to 1 course)**

Prerequisite: Completion of first year of Master's Program or consent of instructor. Supervised field experience in business consulting and other forms of technical assistance for business firms and management in ethnic communities; seminars and other shared learning experiences in transmitting business administration technology to the urban ghetto. The Staff

453. Field Work in Arts Management.

Prerequisite: Consent of instructor. Supervised field experience and practical work in all phases of an arts organization (pictorial, performing, or community), concentrating on its managerial problems and its relationship to the community and society in general. Mr. Faine

Individual Study and Research**596A-596N. Research in Management.****(¼ 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 Management.**(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 Management.**(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 Management.**(1 or 2 courses)**

Prerequisite: consent of Director of Doctoral Program by special petition. Research for and preparation of the doctoral dissertation. The Staff

■ 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.*

Robert J. Blattner, 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.*

Julian D. Cole, Ph.D., *Professor of Mathematics and Engineering and Applied Science.*

Philip C. Curtis, Jr., Ph.D., *Professor of Mathematics (Chairman of the Department).*

Henry A. Dye, Ph.D., *Professor of Mathematics.*

Thomas S. Ferguson, Ph.D., *Professor of Mathematics.*

Theodore Gamelin, Ph.D., *Professor of Mathematics.*

Basil Gordon, Ph.D., *Professor of Mathematics.*

John W. Green, Ph.D., *Professor of Mathematics (Vice-Chairman).*

Magnus R. Hestenes, 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.*

Paul J. Koosis, Ph.D., *Professor of Mathematics.*

Yiannis N. Moschovakis, 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*.
 Masamichi Takesaki, Ph.D., *Professor of Mathematics*.
 Angus E. Taylor, Ph.D., *Professor of Mathematics*.
 Frederick A. Valentine, Ph.D., *Professor of Mathematics*.
 V. S. Varadarajan, Ph.D., *Professor of Mathematics*.
 N. Donald Ylvisaker, Ph.D., *Professor of Mathematics (Vice-Chairman)*.
 Paul H. Daus, Ph.D., *Emeritus Professor of Mathematics*.
 Paul G. Hoel, Ph.D., *Emeritus Professor of Mathematics*.
 I. S. Sokolnikoff, Ph.D., *Emeritus Professor of Mathematics*.
 Donald G. Babbitt, Ph.D., *Associate Professor of Mathematics*.
 Kirby A. Baker, Ph.D., *Associate Professor of Mathematics*.
 Victor Barcilon, Ph.D., *Associate Professor of Mathematics*.
 Robert F. Brown, Ph.D., *Associate Professor of Mathematics*.
 Michael G. Crandall, Ph.D., *Associate Professor of Mathematics*.
 Rodolfo DeSapio, Ph.D., *Associate Professor of Mathematics*.
 Hector Fattorini, Ph.D., *Associate Professor of Mathematics*.
 John Garnett, Ph.D., *Associate Professor of Mathematics*.
 David Gillman, Ph.D., *Associate Professor of Mathematics*.
 Nathaniel Grossman, Ph.D., *Associate Professor of Mathematics*.
 Alfred Hales, Ph.D., *Associate Professor of Mathematics (Vice-Chairman)*.
 Robert I. Jennrich, Ph.D., *Associate Professor of Mathematics and Biomathematics*.
 Ronald Miech, Ph.D., *Associate Professor of Mathematics*.
 William T. Puckett, Ph.D., *Associate Professor of Mathematics*.
 David Sánchez, Ph.D., *Associate Professor of Mathematics*.
 David Sattinger, Ph.D., *Associate Professor of Mathematics*.
 Leonard Asimow, Ph.D., *Assistant Professor of Mathematics*.
 David G. Booth, Ph.D., *Assistant Professor of Mathematics*.
 Douglas N. Clark, Ph.D., *Assistant Professor of Mathematics*.
 Robert Edwards, Ph.D., *Assistant Professor of Mathematics*.
 Herbert B. Enderton, Ph.D., *Assistant Professor of Mathematics in Residence*.
 Fred Galvin, Ph.D., *Assistant Professor of Mathematics*.
 Robert E. Greene, Ph.D., *Assistant Professor of Mathematics*.
 James A. Krupp, Ph.D., *Assistant Professor of Mathematics*.
 Charles G. Lange, Ph.D., *Assistant Professor of Mathematics*.
 Jean A. Larson, Ph.D., *E. R. Assistant Professor of Mathematics*.
 Thomas M. Liggett, Ph.D., *Assistant Professor of Mathematics*.
 Johnnie W. McLaurin, Ph.D., *Assistant Professor of Mathematics*.
 J. Gilbert Miller, Ph.D., *E. R. Hedrick Assistant Professor of Mathematics*.
 Kalyan Mukherjea, Ph.D., *Assistant Professor of Mathematics*.
 James V. Ralston, Jr., Ph.D., *Assistant Professor of Mathematics*.
 Bruce L. Rothschild, Ph.D., *Assistant Professor of Mathematics*.
 Murray Schacher, Ph.D., *Assistant Professor of Mathematics*.
 James D. Stein, Jr., Ph.D., *Assistant Professor of Mathematics*.

Peter C. Trombi, *Assistant Professor of Mathematics.*
 James White, Ph.D., *Assistant Professor of Mathematics.*
 Guy H. Hunt, C.E., *Assistant Professor of Mathematics, Emeritus.*
 ———, *Assistant Professor of Mathematics.*
 ———, *Assistant Professor of 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, Russian or German is strongly recommended for students intending to pursue graduate work.

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.

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 148–149.

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, 130B–130C, 132, 152B. A knowledge of Spanish is recommended for students who intend to teach in the Southwest.

The Major in Mathematics-Applied Science

This is a program designed for students with a substantial interest both in mathematics and its applications to related fields.

Preparation for the Major. Mathematics 11A–11B–11C, 12A–12B–12C with an average grade of "C" or better.

The Major. Seven courses in Mathematics in the 100 series chosen from those numbered 110 and above, with an average grade of "C" or better. Seven upper division courses chosen from not more than two related departments approved by the Mathematics-Applied Science Curriculum Committee of the Mathematics Department.

Students contemplating this major should apply to the Undergraduate Office of the

Mathematics Department normally during their sophomore year. An adviser in the Mathematics Department will be appointed and a proposed program of study drawn up. Upon approval of the program by the Mathematics-Applied Science Curriculum Committee, the student will be accepted into the program.

The Joint Major in Mathematics-Computer Science

This is described on pages 82-83.

The Joint Major in Mathematics-System Science

This is described on page 83.

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 exam-

ination 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 pages 150-151. 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 undergraduate 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 151-154. 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

The Department also offers an interdisciplinary program in applied mathematics leading to the Ph.D. degree in mathematics. Four qualifying examinations are required before the student is advanced to candidacy. The student must pass a written examination in applied real and complex analysis and one chosen from classical applied mathematics, numerical analysis, or probability and statistics. The third examination normally will be based on material covered in a three-course sequence in the mathematics department which is supportive to the student's specialized field. The fourth examina-

tion will be a written or oral examination in the student's specialized field.

Foreign Language

No foreign language is required for the M.A. degree. For the Ph.D. degree, two foreign languages are required. Preferred languages are French, German, and Russian.

Course Repetition

A student may not repeat a mathematics course for credit if he has credit for a more advanced course which has the first course as a prerequisite. This rule applies to all courses taken after Fall Quarter 1969.

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 numbers, algebraic operations, equations and inequalities, functions, polynomials, exponential, and trigonometric functions and their graphs.

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.

11AN-11BN-11CN. 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.

20. Basic Principles of Modern Mathematics.

Prerequisite: one year of calculus. Designed to prepare the lower division student to more easily make the transition to higher mathematics. Proof by induction; set theory (relations, functions, cardinality); inequalities; the ring of integers; complex numbers; polynomial rings.

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-110B-110C. Algebra.**

Prerequisite: courses 12A and 115 or consent of the instructor. Course 110A is not open for credit to students with credit for Mathematics 101A or 101B. 110A: the ring of integers, integral domains, fields, polynomial domains, unique factorization. 110B: groups, structure of finite groups. 110C: further topics in rings and modules; 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. Unsolvability 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

130A-130B-130C. Differential Equations.

Prerequisite to course 130A: Course 12B. Course 130A is not open for credit to students who have credit for course 13A. Prerequisite to course 130B: 130A. Linear ordinary equations and systems, existence and uniqueness of solutions, self-adjoint eigenvalue problems, first and second order linear partial differential equations, separation of variables, special equations and techniques, harmonic functions.

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 inte-

gration 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.

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.

142. Introduction to Continuum Mechanics.

Prerequisite: course 130A or 13C. Elementary tensor analysis. Fundamentals of continuum mechanics: analysis of stress and strain, constitutive and field equations. Examples from solid and fluid mechanics illustrating the mathematical approach to physical problems.

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

The 150 and 152 sequences are parallel courses and transferring between them is not advised.

150A-150B-150C. Probability and Statistics.

Prerequisite: course 12C or 13C. 150A and the first half of 150B constitute an introduction to probability theory. The second half of 150B and 150C

constitute an introduction to statistics. These courses emphasize both theory and applications.

151. Stochastic Processes.

Prerequisite: courses 150AB or 152A and consent of the instructor. Introduction to the theory and applications of stochastic models including Markov chains, Poisson processes, birth and death processes, and Brownian motion. The sequence 150A, 150B, 151 forms a one year course in probability and stochastic processes (and some statistics in 150B).

152A-152B. Applied Mathematical Statistics.

Prerequisite: course 12C or 13C or consent of the instructor. 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.

($\frac{1}{4}$ 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 for students in the mathematics-education program. Students may not receive credit toward the M.A. degree in Mathematics for this course. 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. Students may not receive credit toward the M.A. degree in Mathematics for this course. 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.

206A-206B. Combinatorial Theory.

Prerequisite: Consent of the instructor. Generating functions. Probabilistic methods. Polya's theorem. Enumerative graph theory. Partition theory. Number theoretical applications. Structure of graphs, matching theory, duality theorems. Packings, pavings, coverings, statistical designs, difference sets, triple systems, finite planes. Configurations, polyhedra. Ramsey theory, finite and transfinite, and applications.

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.

M221A-221B-221C. Set Theory.

(Same as Philosophy M221A-221B-221C.) Prerequisite: course 112A or Philosophy 134. Students may not receive credit for both Mathematics M221A-221B-221C and Philosophy M221A-221B-221C. Sets, relations, functions. Partial and total ordering; 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 230 or consent of the instructor. Partially ordered sets, lattices, distributivity 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

226A-226B-226C. Differential Geometry.

Prerequisite: Course 231A or consent of the instructor. Manifold theory; connections, curvature, torsion, and parallelism. Riemannian manifolds; completeness, submanifolds, constant curvature. Geodesics; conjugate points, variational methods, Myers theorem, nonpositive curvature. Further topics such as: pinched manifolds, integral geometry, Kahler manifolds, symmetric spaces.

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-229C. Lie Groups and Lie Algebras.

Prerequisites: Knowledge of basic theory of topological groups and knowledge of differentiable manifolds. Lie groups, Lie algebras, subgroups, sub-

algebras. Exponential map. Universal enveloping algebra. Campbell-Hausdorff formula. Nilpotent and solvable Lie algebras. Cohomology of Lie algebras. Theorems of Weyl, Levi-Mal'cev. Semisimple Lie algebras. Classification of simple Lie algebras. Representations. Compact groups. Weyl's character formula.

TOPOLOGY

230. General Topology.

Prerequisite: Courses 131A-131B or consent of the instructor. Students may not receive credit toward the Master's degree for both 230 and 121. Topological spaces and maps, products, quotient spaces, connectedness and compactness, separation properties, local properties, completeness. Homotopy and the fundamental group.

231A-231B. Manifolds and Bundles.

Prerequisite: Courses 131A-131B and 121, or 230 or consent of the instructor. Fundamental group and covering spaces, simplicial complexes, manifolds and their tangent bundles, vector bundles, vector fields and integral curves, differential forms and exterior derivative. Various additional topics in topology or geometry as time permits.

232A-232B-232C. Algebraic Topology.

Prerequisite: Course 121 or 230 or consent of instructor. Fundamental group; homology theory, singular theory, cellular theory, computation of homology groups; cohomology theory, cup and cap products, duality; homotopy theory, fiberspaces, Hurewicz theorem, obstruction theory.

236. Advanced Topics in Geometric Topology.

Prerequisite: Courses 231A, B or consent of the instructor. Handlebody theory, transversality; PL topology; surgery; topic varies from year to year.

237. Advanced Topics in Algebraic Topology.

Prerequisite: Courses 232A-B-C or consent of the instructor. K-theory; fixed point theory; extraordinary cohomology theories; topic varies from year to year.

ANALYSIS AND DIFFERENTIAL EQUATIONS

245A-245B-245C. Real Analysis.

Prerequisites: Courses 131A-131B and course 121 or the equivalent. (E.g., 230 can be taken concurrently). Students cannot receive credit toward the Master's degree for both 245A and 134. Basic measure theory. Measure theory on locally compact spaces. Fubini theorem. Elementary aspects of Banach and Hilbert spaces and linear operators. Function spaces. Radon-Nikodym theorem. Fourier transform and Plancherel on $\mathbb{R}^n$ and T^n .

246A-246B-246C. Complex Analysis.

Prerequisite: Courses 131A-131B. Students may not receive credit toward the Master's degree for both 246A and 132. Cauchy-Riemann equations. Cauchy's theorem. Cauchy's integral formula and the residue calculus. Power series. Normal families. Harmonic functions. Linear fractional transformations. Conformal mappings. Analytic continuation. Examples of Riemann surfaces. Infinite products. Partial fractions. The classical transcendental functions. Elliptic functions.

247A-247B. Classical Fourier Analysis.

Prerequisite: Course 245 and 1 quarter of course 246. Distributions on $\mathbb{R}^n$ and $\mathbb{T}^n$. Principal values; other examples. Distributions with submanifolds as supports. Kernel theorem. Convolution; examples of singular integrals. Tempered distributions and Fourier transform theory on $\mathbb{R}^n$. Distributions with compact or one-sided supports and their complex Fourier transforms.

248A-248B-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. Ordinary Differential Equations.

Prerequisite: Course 246A or consent of the instructor. 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. Self-adjoint boundary value problems on finite intervals.

250B. Nonlinear Ordinary Differential Equations.

Prerequisite: Course 250A. Asymptotic behavior of nonlinear systems. Stability. Existence of periodic solutions. Perturbation theory of two-dimensional real autonomous systems. The Poincaré-Bendixon theory.

250C. Advanced Topics in Ordinary Differential Equations.

Prerequisite: Courses 250A-250B. Selected topics, such as spectral theory or ordinary differential operators, nonlinear boundary value problems, celestial mechanics, approximation of solutions, and Volterra equations.

251A. Introductory Partial Differential Equations.

Prerequisite: Consent of the instructor. Classical theory of heat, wave and potential equations; fundamental solutions, characteristics and Huygens principle, properties of harmonic functions. Classification of second order differential operators. Maximum principles, energy methods, uniqueness theorems. Additional topics as time permits.

251B-251C. Topics in Partial Differential Equations.

Prerequisite: consent of the instructor. An in depth introduction to topics of current interest in partial differential equations or their applications.

252A-252B-252C. 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.

254A-254B. 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.

FUNCTIONAL ANALYSIS**255A-255B-255C. Functional Analysis.**

Prerequisite: Course 245A-245B-245C and 1 quarter of course 246. Locally convex, Frechet and Banach spaces. Adjoint, spectrum and resolvent. Semigroups of operators in Banach spaces. Spectral theory of bounded and unbounded normal operators in Hilbert space. Differential operators. One parameter unitary groups. Multiplicity theory in separable Hilbert spaces.

256A-256B-256C. Topological Groups and Their Representations.

Prerequisite: Course 255 or consent of the instructor. Topological groups and their basic properties. Haar measure. Compact groups and their representations. Duality and Fourier Analysis on locally compact abelian groups. Induced representations, Frobenius reciprocity. Representations of special groups (Lorentz, Galilean, etc.). Projective representations. Representations of totally disconnected groups.

258A-258B. Commutative Banach Algebras.

Prerequisite: Course 246 and courses 255A and 255B. The Gelfand theory of commutative Banach algebras. Applications to harmonic analysis on locally compact abelian groups. Algebras of holomorphic functions. Special topics.

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, 134, 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.

Prerequisite: Courses 130A, 132 or the equivalent. Transform theory and ordinary differential equations, linear operators and eigenfunction expansions. Solution of typical initial and boundary value problems for the main differential equations of mathematical physics. Elements of integral equations, calculus of variations and perturbation 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, course 115, and courses 140A-140B-140C or consent of 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 approximators; the relevant spaces. Infra-functions. Unsolvence. Smoothing. Approximation in the complex and in geometry. Incompatible systems. Rational and harmonic approximation. Convergence. Classes of approximations. Deviator integrals.

271A. Tensor Analysis.

Prerequisite: Course 131A or consent of the instructor. Algebra and calculus of tensors on n -dimensional manifolds. Curvilinear coordinates, and coordinate-free methods. Covariant differentiation. Green-Stokes theorem for differential forms. Applications to topics such as continuum and particle mechanics.

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.

272. Advanced Topics in Continuum Mechanics.

Prerequisite: courses 142 and 251A or the equivalent. Mathematical aspects of solid and/or fluid mechanics. Instability, wave propagation, nonlinear and stochastic phenomena.

273. Wave Mechanics.

Prerequisite: Consent of the instructor. General concepts of mechanical systems (states, space-time, "logics," etc.). Classical and quantum examples. Correspondence principle. Spinors.

M274A. Asymptotic and Perturbation Methods I.

(Same as Engineering and Applied Science M292A.) Prerequisites: Engineering 192A or equivalent; Mathematics 132 or equivalent. The funda-

mental mathematics of asymptotic analysis, asymptotic expansions of Fourier integrals, method of stationary phase, Watson's lemma, method of steepest descent, uniform asymptotic expansions, elementary perturbation problems.

M274B. Asymptotic and Perturbation Methods II.

(Same as Engineering and Applied Science M292B.) Prerequisites: Engineering course M292A or Mathematics M274A. The fundamental mathematics of asymptotic analysis, limit process expansions, regular and singular perturbation problems, matching of asymptotic expansions, multiple scale methods, application to partial differential equations, near and far fields.

PROBABILITY AND STATISTICS

275A-275B-275C. Probability Theory and Stochastic Processes.

Prerequisite: Course 245A. Connection between probability theory and real analysis. Weak and strong laws of large numbers. Central limit theorem. Ergodic theorems. Martingale theorems. Continuous parameter Markov chains. Brownian motion and related topics.

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.

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.

289. 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 8C 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.
(½ 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 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. (½ to 2 courses)

Study and research for the Ph.D. dissertation. May be repeated for credit.

MEDICAL HISTORY

See Department of Anatomy.

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 L. Fahey, M.D., *Professor of Microbiology and Immunology and Medicine (Chairman of the Department).*

William H. Hildemann, Ph.D., *Professor of Microbiology and Immunology.*

David T. Imagawa, Ph.D., *Professor of Pediatrics and 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 Public Health, Preventive Medicine, and Medical Microbiology and Immunology.*

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.*

Debi P. Nayak, B.V.Sc., Ph.D., *Associate Professor of Microbiology and Immunology in Residence.*

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.*

Benjamin Bonavida, Ph.D., *Assistant Professor of Microbiology and Immunology in Residence.*

Jerrold A. Turner, M.D., *Assistant Professor of Medicine and Microbiology and Immunology in Residence.*

Wendell D. Winters, Ph.D., *Assistant Professor of Surgery and Microbiology and Immunology in Residence.*



Charles W. Buggs, Ph.D., *Visiting Professor of Microbiology and Immunology.*

Seymour Froman, Ph.D., *Associate Clinical Professor of 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, viral oncology, tumor biology, or cell biology. 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.

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 148-149).
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 151-154). (Proficiency in a foreign language is not 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).
5. Participation in teaching of a laboratory section in a course presented by the Department.

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. Bahada**

209. Introduction to Laboratory Research in Immunology.

Prerequisite: Consent of the instructor. The principles of immunology will be reviewed and applied in laboratory evaluations of chemical and cellular components of the immune system. Students will also participate in a short term research project. **Mr. Bonavida and 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**

251. Seminar in Microbiology and Immunology. (¼ course)

Consideration of the history of infectious diseases, their host-parasite relationships, etiology, pathogenesis, epidemiology, diagnosis, and immunity. **The Staff**

252. Seminar in Medical Virology. (¼ course)

Review of current literature in the field of medical virology emphasizing fundamental host-cell interrelationships 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. (½ 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

M257. Seminar in Host-Parasite Relationships.

(½ course)

(Same as Microbiology M257.) A discussion of recent advances in our knowledge of host-parasite interactions and means of controlling the parasites.

Mr. Miller, Mr. Pickett

258. Seminar in Immunology. (½ course)

Discussion, two hours. Prerequisite: Introductory course in immunology equivalent to Microbiology & Immunology 201 or Bacteriology 111. An advanced seminar in a specific area of immunology, i.e., cell mediated immunity, proliferation and differentiation transplantation or tumor immunology. Students will be required to read original research articles, present formal reports and participate actively in critical discussions.

Mr. Fahey

M259. Molecular and Cellular Immunology.

(½ course)

(Same as Bacteriology M259.) Lecture, two hours. Prerequisite: Introductory course in immunology,

equivalent to Microbiology & Immunology 201, Bacteriology 111, or consent of instructors. The major aspects of the immune system will be presented with emphasis on fundamental principles and on advances of the past five years.

Mr. Fahey, Mr. Hildemann, Mr. Sercarz

M260. Immunology Form. (½ course)

(Same as Microbiology M260.) Prerequisite: Bacteriology 111, Microbiology and Immunology 201, Microbiology and Immunology 203, or an elementary course in general immunology. A broad range of current topics in immunology will be presented and discussed at an advanced frontier level. This is a continuing UCLA-wide, general graduate level seminar involving faculty, postdoctoral immunologists, and graduate students from diverse departments.

The Staff

Individual Study and Research**596. Directed Individual Study or Research.**

(½ to 1 course)

Laboratory by arrangement. Consent of Graduate Adviser.

The Staff

597. Preparation for the Comprehensive

Examination for the M.S. Degree or the Qualifying Examination for the Ph.D. in Medical Microbiology and Immunology.

(½ to 1½ courses)

The Staff

599. Research for and Preparation of the Doctoral Dissertation in Medical Microbiology and Immunology. (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, virology, virology oncology, tumor biology, or cell biology.

The Staff

METEOROLOGY

(Department Office, 7127 Mathematical Sciences Building)

Akio Arakawa, D.Sc., *Professor of Meteorology.*

Yale Mintz, Ph.D., *Professor of Meteorology.*

*Morris Neiburger, Ph.D., *Professor of Meteorology.*

Zdenek Sekera, Ph.D., *Professor of Meteorology and Geophysics.*

*Sekharipuram V. Venkateswaran, Ph.D., *Professor of Meteorology.*

Morton G. Wurtele, Ph.D., *Professor of Meteorology (Chairman of the Department).*

Michio Yanai, D.Sc., *Professor of Meteorology.*

Jacob Bjerknes, Ph.D., *Emeritus Professor of Meteorology and Geophysics.*

Jorgen Holmboe, M.Sc., *Emeritus Professor of Meteorology.*

James G. Edinger, Ph.D., *Associate Professor of Meteorology.*

*Hans R. Pruppacher, Ph.D., *Associate Professor of Meteorology.*

* Absent on leave, 1972-1973.

* Absent on leave, Fall Quarter, 1972

George L. Siscoe, Ph.D., *Associate Professor of Meteorology.*

Gerald Schubert, Ph.D., *Associate Professor of Planetary Physics.*

Richard M. Thorne, Ph.D., *Associate Professor of Meteorology.*

Preparation for the Major

The required courses are: Course 10, 40A-40B, Physics 7A-7B-7C-7D; Mathematics 11A-11B-11C, 12A-12B-12C and 130 or 13A-13B-13C.

The Major

The required courses are: Meteorology 109A-109B; Physics 110A-110B, 112A, 131A-131B; four courses from Meteorology 143, 151A-151B, 152, 153, 154, 155, 161A-161B, 162, 163 and 164. In addition, students preparing for graduate studies in Dynamics and Synoptic meteorology should take as electives the following courses: Mathematics 133, 130B, 130C, 140A and 140B; students preparing for graduate studies in Dynamics and Microphysics of Clouds and Precipitation should take as electives the following courses: Physics 112B and 140 and Mathematics 133, 130B and 130C; students preparing for graduate studies in Radiation, Upper Atmospheric and Space Physics should take as electives the following courses: Physics 105A-105B, 108 and 122.

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—astronomy, chemistry, engineering, geophysics, mathematics and physics—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

For the general requirements, see pages 148-149.

A bachelor's degree in one of the following: meteorology (atmospheric sciences), astronomy, chemistry, engineering, geophysics, physics or mathematics.

A study program, approved by the Departmental Graduate Advisers, to fill any de-

ficiencies in the student's preparation for the general examination and to prepare the student in one of the fields of specialization: (1) Dynamic and Synoptic Meteorology, (2) Dynamics and Microphysics of Clouds and Precipitation, or (3) Radiation, Upper Atmospheric and Space Physics.

Meteorology 260 is required.

Knowledge of a foreign language is not required.

The Department grants the Master's degree by either the comprehensive examination plan or by the thesis plan. All students are required to pass a general examination covering the three fields of specialization. The student following the examination plan must also pass a detailed examination in his field of specialization. The student following the thesis plan must submit an acceptable thesis on a topic approved by the Graduate Advisers.

Requirements for the Doctor's Degree

For the general requirements, see pages 151-154.

A reading knowledge of one foreign language, or three courses in computer languages approved by the Graduate Advisers.

Before advancement to candidacy, the student must take a minimum of three graduate courses outside his field of specialization and pass the following examinations: (1) the written general examination required of Master's candidates; (2) a written examination in his field of specialization; (3) an oral examination in his field of specialization conducted by his Departmental Guidance Committee; and, (4) an oral qualifying examination conducted by his Doctoral Committee. He must pass these examinations in no more than two attempts. Students with the Master's degree from this Department are exempt from part (1) of the examinations. Students with a different Master's degree may petition for exemption from part (1).

After advancement to candidacy, the candidate must satisfactorily complete a dissertation which represents an original contribution to knowledge, and must pass a final oral doctoral examination conducted by his Doctoral Committee.

Lower Division Courses

2. Air Pollution.

Lecture, three hours; discussion, one hour. A course for all students interested in the causes and effects of high concentrations of pollution in the atmosphere. Topics covered will include the nature and sources of gaseous and particulate pollutants, their transport, dispersion, modification and removal, with emphasis on atmospheric processes on scales ranging from individual sources to global effects; interaction with the biosphere and the oceans; stratospheric pollution. Mr. Edinger

M3. Introduction to the Atmospheric Environment.

(Same as Physical Sciences M3M.) Lecture, three hours; discussion, one hour. A course specifically designed to satisfy in part the breadth requirement of students majoring outside the Physical Sciences. The nature and causes of weather phenomena, including winds, clouds, rain, lightning, tornadoes and hurricanes; solar and terrestrial radiation; phenomena of the higher atmosphere; the ionosphere and the auroras; causes of air pollution; proposed methods and status of weather modification. This course is not open to students who have received credit for M3L or Physical Sciences M3M. Mr. Siscoe

M3L. Introduction to the Atmospheric Environment.

(Same as Physical Sciences M3ML.) Lecture, three hours; laboratory, two hours. Same as Meteorology M3, with laboratory sessions to illustrate and apply the material of the lectures. This course is not open to students who have received credit for M3, or Physical Sciences M3M. Mr. Edinger

10. Introduction to the Atmospheric Sciences.

Lecture, three hours; discussion, one hour. Prerequisites: Mathematics 11A-B and Physics 7A (7B concurrent). An introductory course in atmospheric processes designed for first year science and engineering students. Topics will include the evolution of planetary atmospheres, their present composition and structure; atmospheric radiation and thermodynamics; elementary atmospheric dynamics; climatic change; planetary ionospheres and magnetospheres. Mr. Thorne

Upper Division Courses

40A. Basic Meteorology I.

Lecture, three hours; laboratory, six hours. Prerequisites: Meteorology 10, Math 11C. Terrestrial energy budget; general circulation; atmospheric motions; fronts and cyclones. Mesoscale dynamics; moist air thermodynamics, cumulus convection. Applications to weather forecasting and modification. (Meteorological instrumentation, observing techniques and the basic principles of map analysis will be covered in the laboratory.) Mr. Edinger

40B. Basic Meteorology II.

Lecture, three hours; discussion, one hour. Prerequisite: Meteorology 40A. Atmospheric chemistry. Microstructure and formation of clouds and precipitation. Atmospheric electricity. Scattering and absorption of radiation in the atmosphere. Upper atmospheric phenomena, ionospheric layer formation, aurora, exosphere escape. The Earth's radiation belts and magnetosphere, and its interaction with the solar wind. Mr. Edinger

M109A. Geophysical Fluid Dynamics.

(Same as Planetary and Space Science M109A.) Lecture, three hours; discussion two hours. Prerequisite: Mathematics 12C or 13C; Physics 7A-7D. Together with 109B, an introduction to fluid dynamics as applied to geophysical problems. Kinematics. Equations of fluid motion. Irrotational flow. Circulation theorems. Vorticity and vortices. Acoustic and gravity waves. Mr. Schubert

109B. Geophysical Fluid Dynamics.

Lecture, three hours; discussion two hours. Prerequisite: course 109A. Rotating reference frames. Low Rossby number motions. Inertial waves, Rossby waves on sphere and β -plane. Stratified rotating fluids. Quasi-geostrophic motion and its stability. Ekman boundary layers. Rayleigh convection. The Staff

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. Mr. Wurtele

151A. Atmospheric Motion I.

Lecture, three hours. Prerequisite: course 109B or consent of the instructor. The quasi-static equations of motion. Planetary-scale oscillations. The quasi-geostrophic equations of motion. Barotropic and baroclinic instabilities. The structure of extra-tropical cyclones. Introduction to numerical weather prediction. Mr. Yari

151B. Atmospheric Motion II.

Lecture, three hours. Prerequisite: course 151A. The general circulation of the atmosphere and global budgets of angular momentum, heat and water vapor. The planetary boundary layer. Moist convection. Frontal and mesoscale weather systems. Tropical cyclones. Mr. Yari

152. Physics of Clouds and Precipitation.

Lecture, three hours. Discussion, one hour. Prerequisites: Mathematics 13C and Physics 112A or Chemistry 110A or consent of the instructor. The nature and structure of clouds and precipitation; phase changes of water in the atmosphere; condensation on nuclei; development of precipitation particles. Mr. Neuburger

153. Atmospheric Radiation.

Lecture, three hours. Prerequisite: Physics 110B and either Physics 122 or Meteorology 109A, or consent of the instructor. Thermal radiation from the sun and planets. Transfer of thermal radiation through planetary atmospheres. Radiation budget. Scattering of electromagnetic radiation by atoms, molecules, dust and aerosols. Remote sensing. Meteorological optics.

M154. The Earth's Plasma Environment.

(Same as Planetary and Space Science M154.) Lecture, three hours. Prerequisite: Physics 110B and either Physics 122 or Meteorology 109A, or consent of the instructor. Particle and electromagnetic emissions from the sun under quiet and under disturbed conditions. The solar wind. The magnetospheres and the ionospheres of the earth and other planets. Geomagnetic phenomena. Aurora and airglow. Mr. Siscoe

155. Introduction to the Stratospheric Environment.

Lecture, three hours; discussion, one hour. Prerequisites: Meteorology 109A-B or consent of the instructor. Radiative and dynamic control of the stratosphere and the mesosphere; photochemistry; direct and remote sensing methods; stratospheric climatology and dynamics, including generation and propagation of internal waves, equatorial quasi-biennial oscillations and the maintenance and breakdown of the polar vortex; nacreous and noctilucent clouds; effects of natural and man-made pollutants. Mr. Venkateswaran

161A-161B. Laboratory in Atmospheric Dynamics.

(½ course)

Prerequisite: course 151A-B concurrent with course 161A-B. Mr. Mintz

162. Laboratory in Cloud and Precipitation Physics.

(½ course)

Prerequisite or concurrent: Meteorology 152 or consent of the instructor. Mr. Neiburger

163. Laboratory in Atmospheric Radiation.

(½ course)

Prerequisite: Junior standing and consent of the departmental undergraduate adviser. Mr. Siscoe

164. Laboratory in Ionospheric Measurements.

(½ course)

Prerequisite: Junior standing and consent of the departmental undergraduate adviser. Mr. Venkateswaran

***165. Laboratory in Meteorological Observation.**

(½ course)

Prerequisite: Junior standing and consent of the departmental undergraduate adviser. Theory and application of instrumentation in field and laboratory. The material covered will be partly determined by the students' interests. Mr. Edinger

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. Meteorological Hydrodynamics.**

Lecture, three hours. Prerequisite: course 109B or consent of the instructor. Wave propagation in the troposphere and stratosphere. A unified, systematic presentation of acoustic, gravity, inertial, baroclinic, Rossby, and tidal wave propagation mechanisms. Problems of reflection, refraction, leaking and absorption. Finite amplitude approximations. Observational studies and verifications. This course complements Meteorology 240. Mr. Wartele

206A-*206B. Atmospheric Convection.

Lecture, three hours. Cellular and turbulent convection over a uniform surface, with applications to atmospheric motion; cloud dynamics.

***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. Wartele

***210A. Theory of Planetary Circulations I.**

Lecture, three hours. Laplace's tidal equations. Hough functions. Oscillations of planetary atmospheres. Planetary waves. Gravity-inertia waves and their dispersion. Mutual adjustment of pressure and velocity fields. Quasi-geostrophic wave instability, including barotropic and baroclinic instabilities. Vertical and horizontal propagations of wave energy. Mr. Arakawa

***210B. Theory of Planetary Circulations II.**

Lecture, three hours. Prerequisite: course 210A. Non-geostrophic baroclinic instability. Forced and free mean meridional circulations. Interactions between waves and zonal flow and between waves. Circulation regimes. Thermally and topographically forced motions. 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 Mars. Mr. Mintz

216A. Dynamics of the Tropical Atmosphere I.

Lecture, three hours. Major characteristics of the tropical atmosphere. Diagnosis of the tropical general circulation. Observations and theories of cumulus convection. The role of cumulus convection in the tropical energy budget. The interaction between cumulus clouds and the large-scale flow. Mr. Yanai

***216B. Dynamics of the Tropical Atmosphere II.**

Lecture, three hours. Climatology and diagnosis of tropical cyclone formation. The macro-structure of tropical cyclones. The eye and spiral rain bands. Budgets of angular momentum and energy. Theory and numerical models of tropical cyclones. Mr. Yanai

***216C. Dynamics of the Tropical Atmosphere III**

Lecture, three hours. Large-scale wave disturbances in the tropics. The equatorial β -plane approximation. Theory of equatorial waves. The energy cycle of tropical waves. Observations and theories of the quasi-biennial oscillation. Mr. Yanai

***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.

DYNAMICS AND MICROPHYSICS OF CLOUDS AND PRECIPITATION**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. Neiburger

***223A. Cloud and Precipitation Physics I.**

Lecture, three hours. Physics of water substance: surface and bulk structure, thermodynamic properties, electric properties, of water vapor, liquid water and ice. Microstructure of water and ice clouds. Physical and chemical properties of cloud-condensation-nuclei and ice-forming-nuclei. Mr. Pruppacher

***223B. Cloud and Precipitation Physics II.**

Lecture, three hours. Thermodynamic theory of phase transition. Thermodynamic and kinetic 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

RADIATION, UPPER ATMOSPHERIC AND SPACE PHYSICS***225. Radiative Processes in the Atmosphere.**

Lecture, three hours. Prerequisite: Meteorology 153. Radiative transfer of thermal radiation; analysis and interpretation of radiation measurements from satellite and space probes. Mr. Sekera

***226. Scattering Processes in the Atmosphere.**

Lecture, three hours. Prerequisite: Meteorology 153. Radiative transfer in a scattering medium. Mr. Sekera

228A-228B. Theory of Radiative Transfer in Planetary Atmospheres.

Lecture, three hours. Prerequisites: Meteorology 225, 226 or consent of the instructor. Radiative transfer in plane-parallel atmospheres, subject to different types of scattering, absorption and emission processes. Mr. Sekera

***230. Theory of Planetary Atmospheres.**

Lecture, three hours. Prerequisites: Background in fluid dynamics and electromagnetism required. PSS 230 desirable. Model planetary atmospheres, including evolution, structure, radiative balance and general circulation; ionospheres and magnetospheres. Comparison with the atmospheres of the terrestrial and outer planets. Mr. Thorne

***240. Upper Atmospheric Wave Phenomena.**

Lecture, three hours. Prerequisite: Physics 110B and 122, or consent of the instructor. Propagation characteristics of acoustic, electromagnetic and plasma waves; magnetotonic theory; ionospheric sounding; ray tracing techniques; instabilities in the earth's plasma 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

***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. 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 plasmapause, geomagnetic storms, ionospheric and magnetospheric current systems, particle precipitation, auroral models, aeronomical processes, irregularities. Mr. Thorne

M250A-250B. Dynamics of the Solar Wind.

(Same as Planetary and Space Science M250A-250B.) Lecture, three hours. Prerequisite: PSS 202 or consent of the instructor. Topics to include hydrodynamic solutions and magnetic field models, effects of the magnetic field and solar rotation, shock waves, discontinuities, small amplitude wave propagation, large scale structure, interaction with the moon, planets, and the interstellar medium, stellar winds, and stellar spin-down. 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, Mr. Pruppacher

* Not to be given, 1972-1973.

283. Seminar in Atmospheric Radiation. (½ course)
Mr. Sekera

284. Seminar in Physics of the Upper Atmosphere.
(½ course)
Mr. Siscoe, Mr. Thorne, Mr. Venkateswaran

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

Related Courses in Other Departments

Astronomy 101; 103A-103B-103C.

Chemistry 110A-110B; 118; 114A; 123A-123B.

Engineering 103A; 117A-117B; 120A; 124A;

125A-125B; 125L; 127B; 131C; M140A; 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; M122; 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-250C; 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; 228A-228B; 260A-260B; 265.

■ MICROBIOLOGY

Graduate Study

The M.A. and Ph.D. degrees in microbiology are offered in the Department of Bacteriology (see pages 195-196). 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

Biology (see pages 202-203), and in the Department of Medical Microbiology and Immunology, School of Medicine (see page 415). 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).*

Tommy L. Thompson, M.S., Major, Infantry, *Associate Professor of Military Science.*

Donald E. Smith, B.A., Major, Field Artillery, *Assistant Professor of Military Science.*

Terry L. May, M.A., Captain, Military Intelligence, *Assistant Professor of Military Science.*

Paul H. Roggenkamp, B. S., Captain, Infantry, *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 mini-

mum 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 a 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 United States Army Reserve or Regular 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 or 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 \$100 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 and the Advanced Course before commissioning. A limited number of one, 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 \$100 per month, military science books, and uniforms. Aliens may participate but they are not eligible for subsistence.

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 apply for 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 basic summer camp, the student will enter the Advanced Course under the same requirements as for the four-year program. He will receive \$100 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 or Regular Army. 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 armed 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 ser-

vice 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.

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 qualities 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, have credit for the Basic Course from other institutions authorized to present the equivalent instruction or can present evidence of honorable 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 \$2000

during the two-year period (exclusive of summer camp). Students have the use of 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 period following the completion of the first year of the Advanced Course. 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 the 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 (½ 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. (½ 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. Attention will also be directed to the evolution of weapons and tactics. CPT. May

1B. Introduction to the Theory of Warfare II. (½ 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 mission, function and organization of the U. S. Army.
CPT. May

1C. The US Defense Establishment. (¼ 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. May

Sophomore Year

20A. United States Military History I. (¼ course)

Study of evolution of United States Army from 1755-1865 with emphasis on leaders and combat actions. An introductory survey of opposing strategies and their relationship to the men who led and served in the Army.
CPT. Roggenkamp

20B. United States Military History II. (¼ course)

Continuation of course 20A from the end of the Civil War to 1939 with emphasis on leadership at all levels and strategies and combat operations of the armies of both sides.
CPT. Roggenkamp

20C. Contemporary Military Systems. (¼ course)

A study of contemporary military systems of the U. S. and other nations in the age of modern warfare (WW II to present). The formation of NATO, UNC, and Warsaw Pact forces is discussed.
CPT. Roggenkamp

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. The student is required to meet and maintain minimum standards of physical fitness established by the Department.

103A. Theory of Instruction.

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 pre-

pare and teach a complete original lesson to his fellow students during the course of the class.

MAJ. Smith

103B. Fundamentals and Dynamics of the Military Team.

A study of small military unit organization, operations and communications. Span of control, coordination and decision making factors receive special consideration.
MAJ. Smith

103C. Theory of Management I.

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. Smith

Senior Year

During the Winter Quarter, the student will enroll in Political Science 138A (Defense Strategies and Policies), formerly reflected as Military Science 104B (The U. S. Role in World Affairs). In addition to Political Science 138A, and the 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. Theory of Management II.

Prerequisite: 103C. An advanced study of the theory and practice of the management functions of planning, organizing, staffing, directing and controlling and their application to the military. Conceptual foundations of systems analysis. Human values and social obligations in management.
MAJ. Thompson

104C. Military Legal Systems.

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. Thompson

■ MOLECULAR BIOLOGY (INTERDEPARTMENTAL)

(Institute Office, 5070 Chemistry)

D. E. Atkinson, Ph.D., *Professor of Chemistry.*

Albert A. Barber, Ph.D., *Professor of Cell Biology.*

Paul D. Boyer, Ph.D., *Director, Professor of Chemistry.*

John Fessler, Ph.D., *Professor of Molecular Biology.*

Alexander N. Glazer, Ph.D., *Professor of Biological Chemistry.*

Isaac M. Harary, Ph.D., *Professor of Biological Chemistry.*

Thomas W. James, Ph.D., *Professor of Cell Biology.*

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.*
 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.*
 David Eisenberg, Ph.D., *Associate Professor of Molecular Biology in Chemistry.*
 F. A. Eiserling, Ph.D., *Associate Professor of Bacteriology.*
 C. Fred Fox, Ph.D., *Associate Professor of Molecular Biology in Bacteriology.*
 Dohn G. Glitz, Ph.D., *Associate Professor of Biological Chemistry.*
 Richard N. Halpern, M.D., *Associate Professor of Medicine in Residence.*
 Donald P. Nierlich, Ph.D., *Associate Professor of Bacteriology.*
 Park S. Nobel, Ph.D., *Associate Professor of Molecular Biology in Botanical Sciences.*
 Winston A. Salser, Ph.D., *Associate Professor of Molecular Biology in Zoology.*
 Felix Wettstein, Ph.D., *Associate Professor of Molecular Biology in Medical Microbiology and Immunology.*
 Patrice Zamenhof, Ph.D., *Associate Professor of Biological Chemistry in Residence.*
 Clifford Brunk, Ph.D., *Assistant Professor of Zoology.*
 William R. Clark, Ph.D., *Assistant Professor of Cell and Molecular Biology.*
 Harvey Herschman, Ph.D., *Assistant Professor of Biological Chemistry.*
 Bruce Howard, Ph.D., *Assistant Professor of Biological Chemistry.*
 John M. Jordan, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*
 Michael Konrad, Ph.D., *Assistant Professor of Molecular Biology in Chemistry.*
 Larry Simpson, Ph.D., *Assistant Professor of Cell Biology.*
 Philip Thornber, Ph.D., *Assistant Professor of Molecular Biology in Botanical Sciences.*

Undergraduate Study

Undergraduate studies which readily lead to advanced work or employment in the molecular biology area include undergraduate majors in biochemistry, biology, or physics. Students may wish to supplement 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.

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 variety of areas as indicated later. Applicants for the Ph.D. degree program should have a major in a biological or physical science or mathematics. Course work should include mathe-

matics 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 Adviser 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 super-

vision 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 Adviser. 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 an additional 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 and Virology**—Molecular basis of transmission and expression of genetic information and of viral replication and action.

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. **Bioenergetics, Catalysis, and Control**—Molecular nature of active transport, photosynthesis, oxidative phosphorylation and related processes; mechanisms of biological catalyses; control mechanisms in catalysis, metabolism, growth and differentiation.

4. **Molecular Basis of Cellular Functions**—Biological ultrastructure as revealed by x-ray analysis and electron microscopy; the molecular changes, controls, and structures involved in development and in evolution; the understanding of neural processes at the molecular level; the chemical, genetic, and physical

changes involved in carcinogenesis and in possible cancer control.

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

- M132. Comparative Genetics. (Same as Biology M132)
- 204. Microbial Genetics Lab.
- 208. Regulatory Mechanism in Microbial Physiology.
- M220. Gene Structure and Function. (same as Microbiology M220 and Bacteriology M220)
- 222A-222I. Advanced Topics in Microbiology.
- M227. Chromosome Structure and Replication. (Same as Microbiology M227 and Bacteriology M227)

Biological Chemistry

- M251. Bioorganic Catalysis. (Same as Chemistry M251.)
- M253. Proteins and Nucleic Acids. (Same as Chemistry M253)
- M255. Biological Catalysis. (Same as Chemistry M255)
- M257. Physical Chemistry of Biological Macromolecules. (Same as Chemistry M257)
- M263. Cellular Metabolism. (Same as Chemistry M263)
- M267. Nucleic Acid and Protein Biosynthesis. (Same as Chemistry M267)

Biology

- 144. Introduction to Molecular Biology.
- 146. Physicochemical Biology.
- 154. Functional Ultrastructure of Cells.
- 159. Experimental Cell Biology.
- 225. Biochemical Analysis of Development.
- 229. Structural Macromolecules.
- M233A-233B-233C. Electron Microscopy. (same as Microbiology M233A-233B-233C and Bacteriology M233A-233B-233C)
- 238. Function and Biogenesis of Subcellular Organelles.

243. The Vertebrate Eye.

281. Seminar in Current Topics in Molecular Biology.

Chemistry

233A. Physical Organic Chemistry.

254. Advanced Biochemical Methods Lab.

261A-261B-261C. Advanced Topics in Biochemistry.

Medical Microbiology and Immunology

208. Animal Virology.

Physiology

202. Permeability of Biological Membranes to Ions.

225. Biological and Artificial Membranes.

MUSIC

(Department Office, 2449 Schoenberg Hall)

Frank A. D'Accone, Ph.D., *Professor of Music.*

Paul E. Des Marais, M.A., *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. Kremeniev, Ph.D., *Professor of Music.*

Henri Lazarof, M.F.A., *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. Rubsamen, Ph.D., *Professor of Music (Chairman of the Department).*

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.*

Clarence E. Sawhill, Mus.D., *Emeritus Professor of Music.*

John N. Vincent, Jr., Ph.D., *Emeritus Professor of Music.*

Paul S. Chihara, A.M.D., *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.*

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.*

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.*

Thomas Harmon, Ph.D., *Assistant Professor of Music and University Organist.*

Richard A. Hudson, Ph.D., *Assistant Professor of Music, and Music Librarian.*

Jozef Pacholczyk, Ph.D., *Assistant Professor of Music.*

James Porter, M.A., *Assistant Professor of Music.*

Paul V. Reale, Ph.D., *Assistant Professor of Music.*

Rodney N. Vlasak, B.A., *Assistant Professor of Music.*

———, *Assistant Professor of Music.*

———, *Assistant Professor of Music.*

Mehli Mehta, *Senior Lecturer in Music.*

Aube Tzerko, B.M., *Senior Lecturer in Music.*

Roger Wagner, Mus.D., *Senior Lecturer in Music.*

Ruth Adams, M.A., M.L.S., *Lecturer in Music.*

Kwasi Badu, *Lecturer in Music.*

David M. Breidenthal, *Lecturer in Music.*

Marjorie Call, B.M., *Lecturer in Music.*

Mario Carta, *Lecturer in Music.*

Peter Crossley-Holland, M.A., *Lecturer in Music.*

Charles DeLancey, M.A., *Lecturer in Music.*

Robert L. DiVall, B.A., *Lecturer in Music.*

Bert Gassman, *Lecturer in Music.*

Alan Gilbert, *Lecturer in Music.*

Gary G. Gray, M.M., *Lecturer in Music.*

Johana Harris, *Lecturer in Music.*

Maureen Hooper, Ed.D., *Lecturer in Music.*

Freeman K. James, M.A., *Lecturer in Music.*

Bess Karp, M.A., *Lecturer in Music.*

Leon Knopoff, Ph.D., *Research Musicologist in Ethnomusicology.*

Dong Youp Lee, *Lecturer in Music.*

Natalie Limonick, B.A., *Lecturer in Music.*

Sinclair R. Lott, B.A., *Lecturer in Music.*

Tsun Y. Lui, *Lecturer in Music.*

Peter Mercurio, M.A., *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.*

David Raksin, B.M., *Lecturer in Music.*

Sven H. Reher, M.A., *Lecturer in Music.*

Jesus Sanchez, *Lecturer in Music.*

Peggy Ann Sheffield, M.M., *Lecturer in Music.*

Gerald Strang, Ph.D., *Lecturer in Music.*

Paul O. W. Tanner, M.A., *Lecturer in Music.*

Suenobu Togi, *Lecturer in Music.*

Donn Weiss, M.M., *Lecturer in Music.*

Erwin Windward, B.A., *Lecturer in Music.*

Ikuko Yuge, *Lecturer in Music.*

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———, *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 Theory of Music. 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 Theory of Music 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 17A through F, 26A-26B-26C. 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 12 courses in the upper division, including 107A, 126A-126B-126C; 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, 140-149, 155, 156, and 192A-192B.

2. **History and Literature:** one course from 127A-127C, one course from 127D-127F, one course from 140A-140B-140C, and two electives from 104, 105, 108, 130-138, 150-151, 155-157, and 191.

3. **Ethnomusicology:** 140A-140B-140C, and two courses selected from 108, 127A-127F, 141-149, 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, 140A-140B-140C, 151, 171, 172, and additional courses in performance.

5. **Music Education:** (a) **Elementary Teaching:** courses 110A-110B, two from 115A-115B-115C-115D, 185, 193, and 331. (b) **Secondary Teaching (Instrumental):** courses 111A, 114A, two from 115A-115B-115C-115D*, 185, and 193. (c) **Secondary Teaching (Choral):** courses 110A-110B, 114A-114B, 185, and 193. (d) **Secondary Teaching (General):** courses 110A-110B or 111A, 114A, two from 115A-115B-115C-115D, 185, and 193.

Graduate Year: 200A-200B, two terms of 270 and student teaching. Five elective courses under advisement. Recommended: 112A-112B-112C, 115A-115B-115C-115D, 108, 140A-140B-140C, 182, 184, 274, or 463.

6. **Systematic Musicology:** (a) **Sociology of Music:** Courses 182, 183, 185, and 8 units chosen from 141-149 and electives listed below. (b) **Acoustics of Music:** courses 108, Psychology 187, 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:** courses 186, Psychology 185, 187, and 8 units chosen from the electives listed below. Electives: Music 108, 137, 138, 150A-150B-150C, 182, 183, 184, 185, 186, Philosophy 160 and Psychology 185, 187.

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

Nine courses of upper division work distributed as follows: courses 107A, 126A-126B-126C; two years of performance or-

* Recommended four additional units in the 115 series either in undergraduate or graduate status.

ganization 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. New students will be admitted for graduate study to the Department of Music only once a year, at the beginning of the Fall term.

Admission Timetable

Application for admission by students desiring financial aid must be received by: December 30th

Departmental examinations will be administered: First week in February

Notice of acceptance or denial: March 15th

Accepted students must notify intent to register: April 15th

Application for admission by all other students must be received by: February 15th

Departmental examinations will be administered: First week in April

Notice of acceptance or denial: May 1st

Accepted students must notify intent to register: May 15th

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 148-149. 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). In addition, all applicants are required to take the departmental entrance examination (see below) and are 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 the examination has been taken and 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 151-154. 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 required to take the departmental entrance examination (see below) and are 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 the examinations have been taken and the above materials are received.

Departmental Entrance Examination

The departmental entrance examination will be administered at Schoenberg Hall on the UCLA campus two times a year in February and in April (see above timetable). Applicants who find it impossible to take the examination on campus should make arrangements with the Department of Music to have the examination administered by proxy on or about one of the dates mentioned here. (For details, further information, write the Music Counselor, Department of Music, UCLA.) The departmental entrance examination is approximately three hours in length and consists of five parts: (1) written exercises in harmony and counterpoint, plus sight-singing, melodic and harmonic dictation; (2) harmonic and formal analysis; (3) identification of musical terms; (4) an essay on a historical subject; (5) score reading at the piano and solo performance in the student's principal performing medium. In addition to the above, a comprehensive examination will be required of students in Music Education. Entrance examinations are evaluated by the Graduate Committee of the Music Department to determine the applicant's fitness for graduate study.

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 148-149. 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, 112A-112B-112C*, 114A-114B*, 119A-119B-119C, 127A-127B-127C-127D-127E-127F, 138, 139, 140A-140B-140C**, 141A-141B, 142, 143A-143B, 145, 146, 147, 148, 149, 151, 155, 156, 157, 160-165, 170-171, 172, 180, 181, 182, 183, 184, 185, 186, Psychology 185, 187. 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 adviser 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), 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 adviser.

2. Systematic musicology: 200A, 200B, three terms of 272, and one term of 255, 269, 273 or 275; the remaining courses are elective upon the recommendation of the graduate adviser.

3. Ethnomusicology: 190A, 190B, 200A, 200B, and a minimum of one term of 280; the remaining courses are elective upon the recommendation of the graduate adviser.

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 adviser.

5. Music Education: a. Thesis Plan: 185, 200A, 200B, and two terms of 270; the remaining courses are elective upon the recommendation of the graduate adviser. b. Comprehensive Examination Plan: 185, 200A, 200B, 274, two terms of 270, and 463; electives from 100-200 series upon recommendation of the graduate adviser. Both plans are designed for students intending to teach, or who are currently teaching at the elementary, secondary, or 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 at the college level); 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 pages 150-151). 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 151-154. 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

* May be applied only by students whose emphasis is music education.

** Will not count for students whose emphasis is ethnomusicology.

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 adviser 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 adviser.

2. Systematic musicology: 200A, 200B, five terms of 272 and one term of 255, 269, 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 adviser.

3. Ethnomusicology: 190A, 190B, 200A, 200B, and a minimum of six terms of 280, part of which may be completed at the M.A. level. 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 adviser.

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 adviser.

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 adviser.

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.

In the field of Systematic Musicology, the written qualifying 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); (d) a general examination in sys-

tematic musicology (two hours); (e) two areas to be selected from acoustics, psychology of music, aesthetics of music, sociology of music and organology (six hours).

In the field of 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, with optional emphasis on theoretical writings before or after 1700 (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. 2A surveys the technical and formal principles of music 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)

Four hours weekly. Prerequisite: Music 1 or consent of the instructor. 3A is prerequisite to 3B; 3B is prerequisite to 3C. Mrs. Patton, Mr. Windward

4. Fundamentals of Piano. (½ course)

Three hours weekly. May be repeated for credit.

5A-5B-5C. Fundamentals of Sound and Music of the World. (½ course each)

Prerequisite: consent of the instructor. The acoustical make-up of sound (pitch, tone quality); tuning systems; modes and scales; harmony and polyphony; rhythm and meter; notational systems; relationships of music to culture. Laboratory: Ear training and instrumental techniques. Mr. Morton

17A-17F. Theory of Music.

(Formerly numbered 10A-10B-10C, 11A-11B-11C, 12A-12B, 106A) Eight hours weekly, including four laboratory hours. Prerequisites: Aptitude,

Achievement and Performance examinations. Series must be taken in order A,B,C,D,E,F. An integrated two-year sequence, taught by the same instructor, dealing with basic skills, including theoretical (analytical), creative (compositional), and practical application of disciplines in musicianship, harmony, elementary counterpoint, and instrumentation.

The Staff

26A-26B-26C. History and Literature of Music I.

(Formerly numbered 13A, 100A, 120, 121, 122) Five hours weekly, including one laboratory hour. Prerequisites: Music 17A-17B-17C. 26A is prerequisite to 26B; 26B is prerequisite to 26C. The history and literature of music from the beginning of the Christian era to 1750, with emphasis upon analysis of representative works of each style period. Materials selected will illustrate the history of style and changing techniques of composition. The Staff

60-65. Applied Study of Music Literature:

Intermediates. (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. The Staff

Woodwind Classes. 61A. Flute; 61B. Oboe; 61C. Clarinet; 61D. Bassoon; 61E. Saxophone. The Staff

Brass Classes. 62A. Trumpet; 62B. French Horn; 62C. Trombone. The Staff

Percussion Classes. 63. Percussion. The Staff

Keyboard Classes. 64A. Piano; 64B. Organ; 64C. Harpsichord. The Staff

Voice Classes. 65. Voice. The Staff

70A-70S. Performance Organizations.

(½ course each)

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; 70R. Jazz Ensemble; 70S. Afro-American Music. The Staff

71A-71P. Ethnomusicology Performance Organizations. (½ course each)

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; 71P. Music and Dance of Sunda. 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

101. Keyboard Harmony and Score Reading.

Four hours weekly. Prerequisites: courses 17A through 17F. Emphasizes the reading of figured bass, sequences, modulations in the harmonic vocabulary of the 18th and 19th centuries. Reading at the piano of multistaff 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 17A through 17F. The advanced study of harmonic practices. Mr. Travis

104. Advanced Modal Counterpoint.

Three hours weekly. Prerequisites: courses 17A through 17F and 26A-26B. Writing in three and more voices, with emphasis on 16th century practices. The Staff

105. Fugue.

Three hours weekly. Prerequisites: courses 17A through 17F and 26A-26B-26C. Fugal writing for three and more voices. The Staff

106B-106C. Orchestration.

Three hours weekly. Prerequisites: courses 17A through 17F; course 106B is prerequisite to 106C. Scoring for Ensembles and Full Orchestra. The Staff

107A-107B-107C. Composition.

Three hours weekly. 107A. Prerequisites: courses 17A through 17F. 107A is prerequisite to 107B; 107B is prerequisite to 107C. 107B-107C are 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.

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 discussion. The Staff

109A-109B-109C. Composition for Motion Pictures and Television. (½ course each)

Two hours weekly. Prerequisites: courses 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. Baksin

110A-110B-110C. Study and Conducting of Choral Literature. (½ course each)

Prerequisite: courses 17A through 17F and 26A-26B-26C. 110A is prerequisite to 110B or 110C. The theory and practice of conducting as related to the study of choral works from the Renaissance to the present day. 110A. Conducting fundamentals including basic skills, techniques, analysis and rep-

ertoire. 110B: Stylistic interpretation of music literature. 110C: Skills and techniques applied to practices and problems in the schools. Mr. Weiss

111A-111B-111C. Study and Conducting of Instrumental Literature. (½ course each)

Prerequisite: courses 17A through 17F and 26A-26B-26C. 111A is prerequisite to 111B or 111C. The theory and practice of conducting as related to the study of instrumental works for string and wind ensembles. 111A: Conducting fundamentals including basic skills, techniques, analysis and repertoire. 111B: Stylistic interpretation of music literature. 111C: Skills and techniques applied to practices and problems in the schools. Mr. Mehta

112A-112B-112C. Practical Scoring.

Four hours weekly. Prerequisites: courses 17A through 17F, 26A-26B-26C, and 193. Emphasis on practical problems in scoring for small and large ensembles at various educational levels. 112A. Band Scoring; 112B. Choral Scoring; 112C. Orchestral Scoring. The Staff

113. Music Literature for Children.

Four hours weekly, including one laboratory hour. Prerequisite: courses 1, 2A, 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 17A through 17F, 26A-26B-26C and 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 17A through 17F, 26A-26B-26C and 193. The study of instruments and the techniques used in the development of tone, intonation, fingering, relationships and transposition. The Staff

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

126A-126B-126C. History and Literature of Music II.

(Formerly numbered 13B, 100B, 123, 124, 125) Five hours weekly, including one laboratory hour. Prerequisites: Music 17A through 17F, and 26A, 26B, 26C. 126A is prerequisite to 126B; 126B is prerequisite to 126C. The history and literature of music from 1750 to the present with emphasis upon analysis of representative works of each style period. Materials selected will illustrate the history of style and changing techniques of composition. The Staff

127A-127F. Selected Topics in the History of Music.

Special aspects of the music of each period, studied in depth. Each course may be repeated once for credit by graduate students only. 127A. *Middle Ages*; 127B. *Renaissance*; 127C. *Baroque*; Prerequisites: courses 17A through 17F, and 26A-26B-26C. 127D. *Classic*. Prerequisites: courses 17A through 17F, 26A-26B-26C, and 126A. 127E. *Romantic*. Prerequisites: Courses 17A through 17F, 26A-26B-26C, and 126A-126B. 127F. *Twentieth Century*. Prerequisites: courses 17A through 17F, 26A-26B-26C, and 126A-126B-126C.

130. Music of the United States.

Four hours weekly. Prerequisite: course 2A or consent of the instructor. A survey of art music from colonial times to the present. Mr. Marrocco

131A-131B. Music of Hispanic America.

Four hours weekly. Prerequisites: consent of the instructor. 131A is not prerequisite to 131B. Survey of art music including attention to ethnic developments and Peninsular background. 131A. Mexico, Central America and the Caribbean isles; 131B. Hispanic South America. Mr. Stevenson

132A-132B. Development of Jazz.

Four hours weekly, including one laboratory hour. Prerequisite: course 2A 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.

Four hours weekly, including two laboratory hours. Prerequisite: course 2A or consent of the instructor. The life and works of Johann Sebastian Bach. The Staff

134. Beethoven.

Four hours weekly, including two laboratory hours. Prerequisite: course 2A or consent of the instructor. The life and works of Ludwig van Beethoven. The Staff

135A-135B-135C. History of the Opera.

Five hours weekly, including one laboratory hour. Prerequisite: course 2A 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.

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.

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.

Three hours weekly. Prerequisite: course 2A 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.

Four hours weekly. Prerequisite: course 2A 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.

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.

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.

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.

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

M144. American Folk and Popular Music.

(Same as Folklore M144.) Four hours weekly. Prerequisite: course 2A 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. The Staff

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. Lai

148. Music of the Near East.

Prerequisite: 140A-140B-140C, or consent of the instructor. Study of the music of the Near East, including historical and cultural background, forms and styles of various traditions, instruments and ensembles; the music in its social context. The Staff

149. Music of Tibet

Prerequisite: 140A-140B-140C or consent of the instructor. A study of the traditional music of ethnic Tibet as ritual, recreation, and folklore, including a review of the place of music in Tibetan life and its relationship with other arts, selected analyses of styles and forms, and a study of musical instruments and ensembles. The Staff

150A-150B-150C. Music Criticism. (½ course each)

Two hours weekly. Prerequisite: course 2A 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.

Four hours weekly. Prerequisites: courses 17A through 17F and 26A-26B-26C. A study of musical interpretation and re-creation from the viewpoint of stylistic authenticity. Not open for credit to those who have had two units of 151. The Staff

M154A-154B. The Afro-American Musical Heritage.

(Same as Folklore M154A-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. The Staff

155. Survey of Electronic Music.

Four hours weekly. Prerequisites: courses 17A-17B-17C or consent of the instructor. Designed as an introduction to electronic music. A historical survey of the development of electronic music, its techniques, representative works of the literature, and related developments. Includes introduction to elements of acoustics, electronics, equipment and procedures, and problems of performance. Mr. Reale

156. Techniques of Electronic Music.

Four hours weekly. Prerequisite: courses 107A, 155 or its equivalent and consent of the instructor. Theory and techniques of electronic music including practical experience in manipulation of the equipment in the studio. Mr. Strang

157. Music of Brazil.

Four hours weekly. Prerequisites: Consent of the instructor and some knowledge of Portuguese. History of ethnic and art music in Brazil with some reference to Portuguese antecedents. Mr. Stevenson

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. The Staff

Woodwind Classes: 161A. Flute; 161B. Oboe; 161C. Clarinet; 161D. Bassoon; 161E. Saxophone. The Staff

Brass Classes: 162A. Trumpet; 162B. French Horn; 162C. Trombone. The Staff

Percussion Classes: 163. Percussion. 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. The Staff

Voice Classes: 165. Voice. The Staff

170A-170S. Performance Organizations. (½ course each)

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. 170R. Jazz Ensembles*; 170S. Afro-American Music*. The Staff

171A-171P. Ethnomusicology Performance Organizations. (½ course each)

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; 171P. Music and Dance of Sunda. 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

M180. Transcription, Analysis, and Classification of Folk Music.

(Same as Folklore M180.) Five hours weekly. Prerequisite: course 140 or 144. An intensive study of methods and techniques necessary to the study of folk music. The Staff

M181. Folk Music of Central and Western Europe.

(Same as Folklore M181.) Prerequisite: course 2A 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

* No more than two quarters may be applied toward the departmental performance organization requirement.

† Does not fulfill the performance organization requirement for music majors unless 170J is taken concurrently.

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

M183. Ethnography of Blues.

(Same as Folklore M183.) 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

185. Historical and Philosophical Foundations of Music Education.

Three hours weekly. Prerequisites: courses 17A through 17F, 26A-26B-26C, 193, and any three courses in the music education specialization. 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.**

Three hours weekly. Prerequisites: courses 140A-140B-140C; may be taken concurrently. The Staff

191. Proseminar in Historical Musicology.

Three hours weekly. Prerequisite: courses 126A-126B-126C. The Staff

192A-192B. Proseminar in Composition.

Three hours weekly. Prerequisites: 106C and 107C or consent of the instructor. The Staff

193. Proseminar in Music Education.

Three hours weekly. Prerequisites: courses 17A through 17C. This course is prerequisite to all courses in the music education specialization. Mr. Gerow, Miss Hooper

199. Special Studies in Music.

Prerequisite: senior standing, consent of the instructor and adviser, and a 3.0 grade-point average. 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 93.

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.

Three hours weekly. Prerequisite: consent of the instructor. Vocal and instrumental notation; paleography of the period. Mr. Reaney

211. Renaissance Notation.

Three hours weekly. Prerequisite: consent of the instructor. 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.

Three hours weekly. Prerequisite: courses 106B and 107C. May be repeated for credit. The Staff

252. Seminar in Composition.

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

254A-254B. Seminar in Field and Laboratory Methods in Ethnomusicology.

Three hours weekly. Prerequisites: courses 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: courses 126A-126B-126C. The analysis of structural organizations in music. The Staff

257. Seminar in Music of the United States and Canada.

Three hours weekly. Prerequisite: course 130. Mr. Marrocco

M258. Seminar in Anglo-American Folk Music.

(Same as Folklore M258.) Three hours weekly. Prerequisite: course M144. Mr. Wilgus

259. Seminar in Music of Latin America.

Three hours weekly. Prerequisite: course 131. Mr. Stevenson

260. Seminar in Historical Musicology.

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: courses 126A-126B-126C. Analysis in depth of trends and movements in 20th century music.

269. Seminar in the History of European Instruments.

Three hours weekly.

The Staff

270. Seminar in Music Education.

Three hours weekly. Prerequisite: course 193. May be repeated for credit. Mr. Gerow, Mr. Schwadron

272. Seminar in Systematic Musicology.

Three hours weekly. Prerequisite: course 108, Psychology 185 and 187, 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 188.

Mr. Marrocco

280. Seminar in Ethnomusicology.

Three hours weekly. Prerequisite: courses 190A-190B and 200A-200B. May be repeated for credit. Mr. Hood

Professional Courses**330. Music for the Classroom Teacher.**

Four hours weekly. Prerequisite: consent of the instructor. A professional course to equip the student to teach many phases of music in the elementary school. Emphasis is placed upon the study of musical literature and interpretive activities. (Designed for the non-major.) Miss Hooper

331. Music in the Elementary School.

Four hours weekly. Prerequisites: courses 17A through 17F, 26A-26B-26C, and 193. The study of instructional materials and techniques for music in the elementary school with emphasis on the role of the music specialist. (Designed for the music major and minor.) Miss Hooper

370. Music in General Education. (½ course)

Two hours weekly. Prerequisite: courses 110A-110B 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 185. Music, the Individual, and Society. 187. Perception of Music.****■ NAVAL SCIENCE**

(Department Office, 123 Men's Gymnasium)

Charles B. Armstrong, Jr., A.B., M.A., M.S., Colonel, U. S. Marine Corps, *Professor of Naval Science (Chairman of the Department)*.

David L. Beesley, A.B., Commander, U. S. Navy, *Associate Professor of Naval Science (Vice-Chairman of the Department)*.

Gary C. Chapman, B.S., Lieutenant, U. S. Navy, *Assistant Professor of Naval Science*.

Arthur L. Dean, B.S., *Lieutenant Commander, U. S. Navy, Acting Assistant Professor of Naval Science*.

Nelson P. Hendricks, A.A., B.A., M.S., Major, U. S. Marine Corps, *Assistant Professor of Naval Science*.

Richard F. Schuerger, B.S.(EE), Lieutenant Commander, U. S. Navy, *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 number of free elective courses for which naval science courses may be substituted.

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 an education at civil institutions 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 \$100 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 \$100 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.

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. Introduction to Naval Organization. (½ 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. The Staff

1B. Naval Weapons Systems.

An introduction to naval weapons systems. Representative gun, missile and underwater battery fire control systems are examined to learn how each solves its peculiar fire control problem. Warheads and associated fuses are examined in detail. The Staff

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. The Staff

Sophomore Year

20A. Seapower and Maritime Affairs. (½ course)

A conceptual study of seapower, emphasizing the historical development of naval and commercial power. Seapower is examined in relation to economic, political and cultural strengths, focusing on current abilities of specific nations to utilize the oceans to attain national objectives. The Staff

20B. Oceanology. (½ Course)

Prerequisite: Consent of Instructor. An introductory study of the oceanic environment, focusing on man's increasing ability to effectively operate in the sea and to use it as a resource area. Specific topics include ocean dynamics, seabed topography, current oceanographic research and international implications. The Staff

Junior Year

101. Navigation. (1½ courses)

Prerequisite: consent of Instructor. A study of the principles and procedures of piloting, electronic, and celestial navigation employed in the determi-

nation of position at sea. Course includes spherical trigonometry, mathematical analysis, sextant sights and use of navigation aids. The Staff

105. Naval Analysis. (½ course)

An introduction to tactical formations and dispositions, ship maneuvers, relative motion, maneuvering board. Tactical plots are analyzed for force effectiveness and unity. The Staff

*103. Military Operations.

A study of the evolution of warfare including historical and comparative consideration of the influence that leadership, political, economic, and sociological and technological development factors have had on warfare, and the influence they will continue to exert in the age of limited warfare. The Staff

Senior Year

102A-B. Naval Organization and Management I & II.

A study of the fundamental concepts of management with particular emphasis on management within the Naval Service. The course evaluates basic principles and extends their application to advanced management systems theory, information theory and communication theory. The Staff

102C. Leadership and Military Justice. (½ course)

Conceptual approaches to leadership, interpersonal relationships, motivational practices and counselling techniques, ethical and moral responsibilities of persons in authority. Introduction to military law. The Staff

*104. Amphibious Operations. (1½ courses)

A study of the art of amphibious operations including the historical development of techniques used to project military power from sea to land. The evolution of amphibious doctrine and techniques is examined through study of the U.S. landings during World War II, The Korean Conflict and the Vietnam War. The Staff

102D. Naval Weapons Systems.

The weapons control and delivery problem is analyzed by examination and comparison of representative fire control systems. Generic components, functional operation, capabilities and limitations of sensory systems are examined in detail. Not open for credit to students having taken N.S. 1B. The Staff

* Courses to be taken by candidates for commissions in the Marine Corps or Marine Corps Reserve in lieu of courses 101, 105, 102A-B, 102C.

NEAR EASTERN LANGUAGES

(Department Office, 302 Royce Hall)

Amin Banani, Ph.D., *Professor of Persian and History.*

Arnold Band, Ph.D., *Professor of Hebrew.*

Seeger A. Bonebakker, Ph.D., *Professor of Arabic.*

Pinhas Delougaz, *Baccalaureate Professor of Near Eastern Archaeology in Residence*

Wolf Leslau, *Docteur-ès-Lettres, Professor of Hebrew and Semantic Linguistics.*

Moshe Perlmann, Ph.D., *Professor of Arabic.*

Avedis K. Sanjian, Ph.D., *Professor of Armenian.*

Andras Bodrogligeti, Ph.D., *Visiting Associate Professor of Turkic and Iranian.*

Hanns-Peter Schmidt, Ph.D., *Professor of Iranian.*

Stanislav Segert, Ph.D., *Professor of Biblical Studies and Northwest Semitics.*

Andreas Tietze, Ph.D., *Professor of Turkish.*

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.*

Donald Stilo, Ph.D., *Assistant Professor of Persian.*

Arne A. Ambros, Ph.D., *Assistant Professor of Arabic.*

———, *Chairman of Department.*

Shimeon Brisman, *Lecturer in Hebrew.*

Jay D. Frierman, M.A., *Lecturer in Near Eastern Archaeology.*

Aaron Haddad, Ph.D., *Lecturer in Arabic.*

David L. Lieber, D.H.L., *Lecturer in Hebrew.*

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; one quarter course from History 137A, 137B, 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, 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, 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 East 150A–150B, History 117, 140A–140B, 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 student 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 148–149.

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 151.

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, Phoenician, 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

§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

† Given in alternate years; not to be given 1972-1973.

§ Given in alternate years, to be given, 1972-1973.

†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

162. Archaeology of Palestine.

Lecture three hours. A survey of the archaeology of Palestine and the Sinai Peninsula from the Paleolithic to the destruction of Jerusalem in 586 B.C. with emphasis on the geographic setting and relationships to the other cultures of the Near East.

Mr. Frierman

199. Special Studies in the Ancient Near East. (½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

Graduate Courses**\$210. Late Egyptian.**

(Formerly numbered 122A-122B.) Lecture, 3 hours. Prerequisite: 121A-121B-121C and consent of the instructor. An introduction to late Egyptian grammar and reading of both hieroglyphic and hieratic texts. The quarters in which this course is offered vary from year to year. Check with department.

Mr. Callender

220. Seminar in Ancient Egypt.

Three hours. Prerequisite: consent of the instructor.

Mr. Callender

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

281. 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 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 101A-101B-101C. Egyptian Art and Archaeology.**

104. Art of the Ancient Near East.

210. Egyptian Art.

History 117. History of Ancient Egypt.

124C. Religions of the Ancient Near East.

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, five 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

†103A-103B-103C. Advanced Arabic.

Lecture, five 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: 102A-102B-102C. 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: Arabic 102A-102B-102C. 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. Reading and interpretation of texts from classical Arabic literature: Koran, historiography, geography and poetry.

The Staff

* Not to be given 1972-1973.

† Given in alternate years; not to be given 1972-1973.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years. To be given, 1972-1973.

132A-132B-132C. Philosophical Texts in Classical Arabic.

Lecture, three hours. Prerequisites: courses 102A-102B-102C or consent of the instructor. A study of excerpts from the major works of medieval Arab philosophy. The Staff

140A-140B-140C. Modern Arabic Texts.

Lecture, three hours. Prerequisites: 102A-102B-102C. Readings and interpretation of modern Arabic texts. The Staff

141. Modern Arabic Literature.

Prerequisite: Arabic 140 or its equivalent. Readings of selected texts representing the most important modern styles and trends. May be repeated for credit with the consent of the instructor. 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

180B-180C. Structure of Literary Arabic.

Lecture, three hours. Prerequisite: consent of the instructor. A survey of the basic structural features of literary Arabic. 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. Mr. Bonebakker

240A-240B-240C. Arab Historians and Geographers.

Two hours. Readings from the works of the most outstanding Arab historians and geographers of the classical period of Islam. Mr. Perlmann

250A-250B-250C. Seminar in Arabic Literature.

Two hours. May be repeated for credit with the consent of the instructor. 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. Prerequisites: courses 101A-101B-101C or the equivalent. Reading of selected texts, composition and conversation. The Staff

103A-103B. Advanced Modern Armenian.

Three hours. Prerequisites: courses 102A-102B-102C or the equivalent. Readings in advanced modern Armenian texts. Mr. Sanjian

130A 130B. Elementary Classical Armenian.

Three hours. Grammar of the Classical Armenian language and readings of selected texts. Mr. Sanjian

131A 131B. Intermediate Classical Armenian.

Three hours. Prerequisites: courses 130A-130B or the equivalent. Reading of selected texts. Mr. Sanjian

132A-132B. Advanced Classical Armenian.

Three hours. Prerequisites: 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

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. Fifth 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

* Not to be given, 1972-1973.

† Given in alternate years, not to be given in 1972-1973.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years. To be given, 1972-1973.

\$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

\$280. Seminar in Armenian Historiography.

Two hours. Prerequisite: courses 131A-131B or the equivalent. 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 M150. 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 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**†101. Hebrew Conversation and Composition.**

Five hours. Prerequisites: Hebrew 1A-1B-1C. Summer Session. Credit is not applicable to the Hebrew major. The Staff

†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

†103A-103B-103C. Advanced Hebrew.

Five hours. Prerequisite: courses 102A-102B-102C or the equivalent. 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

* Not to be given 1972-1973.

† Given in alternate years, not to be given in 1972-1973.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years. To be given, 1972-1973.

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. 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, Ahad, Ha'am, Agnon, Yizhar; poetry—Bialik, Tchernichovsky, Greenberg, Shlonsky, Alterman, Amichai. 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 literary, political, sociological, philosophical, and scholarly essay will be studied. The Staff

†190A-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

220. Studies in the Text of the Hebrew Bible.

Lecture, 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. May be repeated for credit. Mr. Segert

*Not to be given 1972-1973.

† Given in alternate years, not to be given in 1972-1973.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years. To be given, 1972-1973.

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

S242A-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 Another Department**History 137A-137B. Jewish Intellectual History.****138A-138B. Jewish History.****Iranian****Upper Division Courses****†101A-101B-101C. Elementary Persian.**

Lecture, four hours; laboratory, two hours.

Mr. Stilo

102A-102B-102C. Advanced Persian.

Lecture, three hours; laboratory, two hours. Prerequisite: courses 101A-101B-101C or the equivalent. Mr. Stilo

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

169. Civilization of Pre-Islamic Iran.

(Formerly Indo-European Studies 169.) A survey of Iranian culture from the beginnings through the Sasanian period. Mr. Schmidt

170. Religion in Ancient Iran.

Lecture, four hours. History of religion in Iran from the beginnings to the Mohammedan conquest. Indo-Iranian Background. Zoroastrianism. Manichaeism. Mazdakism. Mr. Schmidt

†190A-190B. Introduction to Modern Iranian Studies.

Three hours. Prerequisite: Persian 101A-101B-101C or their equivalent. Survey of the Iranian languages. Comparative and historical grammar. The Staff

199. Special Studies in Iranian. (½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

Graduate Courses

***210A-210B. The History of the Persian Language.**

Lecture, three hours. Prerequisite: consent of the instructor. Survey of the development of the new Persian language against the background of Middle and Old Persian stages. Mr. Stilo

220A-220B. Classical Persian Texts.

Three hours. Prerequisite: courses 102A-102B-102C or consent of the instructor. Study of selected classical Persian texts. May be taken independently for credit. Mr. Banani

M222A-222B. Vedic

(Formerly numbered Indo-European Studies 222A-222B and same as Oriental Languages M222A-222B.) Prerequisites: A knowledge of Sanskrit equivalent to Oriental Languages 162, and consent of the instructor. Characteristics of the Vedic dialect and readings in the Rig-Vedic hymns. Mr. Schmidt

230A-230B. Old Iranian.

(Formerly numbered Indo-European Studies 230A-230B.) Lecture 3-4 hours. Prerequisite: consent of the instructor. Studies in the grammars and texts of Old Persian and Avestan. Comparative considerations. Mr. Schmidt

S231A-231B. Middle Iranian.

(Formerly numbered Indo-European Studies 231A-231B.) Prerequisite: consent of the instructor. Studies in the grammars and the texts of such Middle Iranian languages as best serve the students' needs (e.g. Pahlavi, Sogdian, Sakan). Mr. Schmidt

S250. Seminar in Persian Literature.

Three hours. Prerequisite: courses 102A-102B-102C and Iranian 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 Preparation.

(½ to 2 courses)

The Staff

Related Courses in Other Departments

History 211A-211B-211C. Islamic Iran.

Oriental Languages 160. Elementary Sanskrit.

161. Intermediate Sanskrit.

162. Advanced Sanskrit.

Indo-European Studies 210. Indo-European Linguistics: Advanced Course.

260A-260B. Seminar in Indo-European Mythology.

280A-280B. Seminar in Indo-European Linguistics.

Linguistics 225U. Persian Phonology and Syntax.

225V. Persian Syntax. Prerequisite: course 225U.

Islamic

Individual Study and Research

596. Directed Individual Study. (½ to 2 courses)

The Staff

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

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

SM241. Folklore and Mythology of the Near East.

(Same as Folklore M241.) 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

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

* Not to be given, 1972-1973.

† Given in alternate years, not to be given 1972-1973.

‡ Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given 1972-1973.

102A-102B-102C. Advanced Amharic (Modern Ethiopic).

Lecture, three hours. Prerequisite: Semitics 101A-101B-101C or consent of the instructor. Mr. Leslau

S130. Biblical Aramaic.

Three hours. Prerequisite: Hebrew 102A-102B-102C or the equivalent. Grammar of Biblical Aramaic and reading of texts. Mr. Segert

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 Ethiopic languages: Geez, Tigrinya, Tigre, Amharic, Harari, Gurage, and Gafat. Mr. Leslau

210. Ancient Aramaic.

Two hours. Prerequisites: Semitics 130 or consent of the instructor. Reading of the surviving inscriptions and papyri. Mr. Segert

S215A-215B. Syriac.

Two hours. Morphology and syntax of the Syriac language; readings in the Syriac translation of the Bible and Syriac literature. Mr. Segert

†220A-220B. Ugaritic.

Two hours. Prerequisites: Hebrew 103A-103B-103C or the equivalent. Study of the Ugaritic language and literature. Mr. Segert

225. Phoenician.

Lecture, two hours. Prerequisites: Hebrew 103A-103B-103C or the equivalent. Study of Phoenician language and inscriptions. Mr. Segert

230. Seminar in Northwest Semitic Languages and Literatures.

Two hours. Prerequisite: consent of the instructor. May be repeated for credit. Mr. Segert

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

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. The Staff

S111A-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. The Staff

S112A-112B-112C. Uzbek.

Three hours. Prerequisite: 102A or consent of the instructor. Grammar, reading of literary and folkloristic texts. The Staff

†113A-113B-113C. Kirghiz.

Three hours. Prerequisite: 102A, or consent of the instructor. Grammar, reading of literary and folkloristic texts. The Staff

190A-190F. Survey of the Turkic Languages.

Prerequisites: course 102A or consent of the instructor. 190A-190B-190C: Comparative Turkic

‡ Given in alternate years, not to be given in 1972-1973.

† Native speakers of the language will not normally be eligible for this course.

§ Given in alternate years, to be given, 1972-1973.

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. The Staff

199. Special Studies in Turkic Languages.
(½ to 2 courses)

Prerequisite: consent of the instructor. The Staff

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 Diplomats.**

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

598. 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 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.

■ NEUROSCIENCE (INTERDEPARTMENTAL)

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 31). 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 are required to complete a core curriculum 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, and immunology.

Both the core and in-depth curricula include major commitments to appropriate courses listed by departments, in addition to offerings shown below. Written and oral qualifying examinations normally are taken as the formal instruction period approaches completion.

* Not to be given, 1972-1973.

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.

Graduate Courses

200A-200B-200C. Clinical Concepts in the Neurosciences. (½ course each)

Presents information concerning neurological and psychiatric disorders for students from basic science backgrounds.

Mr. Hanley, Mr. Walter

233. Seminar in Neuroscience. (½ course)

Topics of current importance will be presented for discussion. Subject matter will be announced.

Mr. French

254. Interdisciplinary Research Seminar. (½ course)

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

256A-256B-256C. Survey of the Basic Neurological Sciences. (½ course each)

Summary information concerning methodologies utilized in different research approaches to brain study, (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. Sterman

259A-259B-259C. Neurophysiology of Behavior: The Fetus, Newborn, and Infant. (½ course each)

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

596. Directed Individual Study or Research.

(½ to 1 course)

Prerequisite: consent of instructor. Mr. French

597. Preparation for the Doctoral Qualifying Examination. (½ to 1 course)

Prerequisite: consent of instructor. Mr. French

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)

Rheba de Tornay, R.N., M.A., Ed.D., *Professor of Nursing (Chairman of the Department).*

Dorothy E. Johnson, R.N., M.P.H., *Professor of Pediatric Nursing.*

Harriet C. Moidel, R.N., M.A., *Professor of Medical-Surgical 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.*

Beatrice M. Dambacher, R.N., M.S., N.Sc.D., *Associate Professor of Psychiatric Nursing.*

Agnes A. O'Leary, R.N., M.P.H., *Associate Professor of Public Health Nursing and Lecturer in Public Health Nursing*

Donna L. Vredevoe, Ph.D., *Associate Professor of Nursing.*

Pamela Brink, R.N., M.S., Ph.D., *Assistant Professor of Nursing.*

Bonnie Bullough, R.N., M.S., M.A., Ph.D., *Assistant Professor of Nursing.*

Grace L. Deloughery, R.N., M.P.H., Ph.D., *Assistant Professor in Residence in Nursing.*

Louline M. Huckabay, R.N., M.S., Ph.D., *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.*

Betty L. Williams, R.N., M.N., M.S., *Assistant Professor of Nursing.*

Martha Siegel, R.N., M.S., *Assistant Professor of Nursing.*

M. Colleen Sparks, R.N., M.S., *Assistant Professor of Nursing.*

Leonide Tanner, R.N., M.S., *Assistant Professor of Nursing.*

Sally A. Thomas, R.N., M.A., Ph.D., *Assistant Professor of Nursing.*

Barbara Crew, R.N., M.N., *Instructor of Nursing.*

Phyllis A. Paxton, R.N., M.N., *Instructor of Nursing.*

Marilee Rhein, R.N., M.N., *Instructor of Nursing.*

———, *Instructor in Nursing.*



Clara Arndt, R.N., M.S., *Lecturer in Nursing Service Administration.*

Sheila G. Cadman, R.N., M.A., *Lecturer in Nursing.*

Ann D. Drice, R.N., M.S., *Lecturer in Nursing.*

Charles K. Ferguson, Ed.D., *Lecturer in Nursing.*

Judy Grubbs, R.N., M.S., *Lecturer in Nursing.*

Corrine L. Hatton, R.N., M.N., *Lecturer in Nursing.*

Doris M. Holm, R.N., M.N., M.S., *Lecturer in Nursing.*

Jean A. Kerr, R.N., M.S., *Lecturer in Nursing.*

Helen F. McGrane, R.N., M.N., *Lecturer in Nursing.*

Beryl Lovaas, R.N., M.N., *Lecturer in Nursing.*

Betty Neuman, R.N., M.S., *Lecturer in Nursing.*

Mary Quayhagen, R.N., M.S., *Lecturer in Nursing.*
 Joan P. Riehl, R.N., M.S., *Lecturer in Nursing.*
 Cynthia Scalzi, R.N., M.N., *Lecturer in Nursing.*
 G. Marjorie Squaires, R.N., M.A., *Lecturer in Nursing.*
 Bertha B. Unger, R.N., M.A., *Lecturer in Nursing.*
 Rae Jeanne Young, R.N., M.S., *Lecturer in Nursing.*



Rachel A. Ayers, R.N., M.S., *Assistant Clinical Professor of Nursing Service Administration.*
 Elsie M. Beard, R.N., M.S., *Field Work Supervisor.*
 Jacquelin Clutter, R.N., *Field Work Supervisor.*
 Evelyn M. Hamil, R.N., M.N., *Assistant Clinical Professor of Nursing Service Administration.*
 Karen Hasler, R.N., *Field Work Supervisor.*
 Mary Louise Jarvis, R.N., *Clinical Instructor in Public Health Nursing.*
 Ina B. Knight, R.N., M.S., *Clinical Instructor in Public Health Nursing.*
 Barbara W. Madden, R.N., M.S., *Assistant Clinical Professor of Medical-Surgical Nursing.*

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 89 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

104A-104B. The Behavior of Man in Health and Illness.

Lecture, three hours; laboratory, four hours. Prerequisite: Accepted by School of Nursing for Baccalaureate Program in Nursing. A synthesis and ordering of knowledge about biopsychosocial man and his environment within the framework of integrated behavioral systems. Examination of the individual's life cycle, the nature of health and illness and the effects of the stress of illness. Miss Brink

109A-109B. Communication in Health Care. (½ course each)

Lecture, one hour; laboratory, three hours. Study of basic communication and group process theory and its application to practice. Laboratory experience emphasizes development of each individual's ability to communicate effectively in a dyad and in a small group. Mrs. Kerr

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. Kerr, Miss Purinton, Mrs. Tanner

***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 fields. Discussion is directed toward helping the student develop a philosophy and focus for leadership consistent with today's world.

* Not to be given, 1972-1973.

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.

184. Evolution and Dynamics of the Nursing Profession.

Lecture, four hours. A study of the evolution of nursing focusing on historical, ethical, moral, legal, and institutional ramifications of nursing practice. In addition, consideration will be given to the rights, obligations, societal, and institutional expectations of the professional nurse. 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

194. Advanced Clinical Nursing. (1½ courses)

Lecture, 2 hours, laboratory, 16 hours. Prerequisites: 101A-101E, 104A-104B, 109A-109B, 110A-110B-110C, 184. Lecture: Analysis and synthesis of systems for providing nursing care, including evaluation and prediction of success. Laboratory sections in community and hospital settings utilize preceding nursing theory and allow students to pursue areas of interest. Mrs. Williams

195. Nursing Care Practices and Staffing Patterns. (2 courses)

Lecture, three hours; laboratory to be arranged. Prerequisites: courses 101A-101B, 104A-104B-104C, 109A-109B-109C. Analysis and synthesis of systems of administering nursing care programs including evaluation and prediction of success. Participation in administering nursing services. Mrs. Riehl and the 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

199. Special Studies in Nursing. (½ to 1 course)

Prerequisites: senior standing or consent of the instructor. Individual study of a problem in the field of nursing. The Staff

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 Putnam, Miss Vredevoe

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

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. Mrs. Huckabay

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 intervention practice. Mrs. Moidel

409. Survey of Problems in Nursing Care.

Lecture, 2 hours. A theoretical frame of reference for the practice of nursing based on processes related to stressors, reactions to stressors and the reconstitution following stress. Emphasis on socio-cultural, psychological, physiological and development variables. Mrs. Neuman

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. Miss Johnson
Section 2. Management of Developmental Problems. Miss Cahill, Miss Putnam
Section 3. Problems in Patient Motivation. Miss Dambacher
Section 4. Nursing Problems Related to Medical Pathology. The Staff

420. Supervised Practice in Nursing Care.

Prerequisites: courses 401, 410. Application of newly acquired knowledge and technology in nurs-

* Not to be given, 1972-1973.

ing practice. Supervised practice in the clinical area of the student's choice. May be repeated for credit.
The Staff

425. Human Relations in Administration.

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.

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. Mrs. Huckabay

*432. Current Concepts in Community College Nursing Programs.

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.

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. The Staff

*435. Internship in Nursing School Administration. (2 courses)

Prerequisite: postmasters 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. The Staff

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. 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. The Staff

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. Neuman, Mrs. Deloughery

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. Neuman, Mrs. Deloughery

Individual Study and Research

596. Directed Individual Studies for Graduate Students. (1 to 2 courses)

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)

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.*

Kenneth K. S. Chen, Ph.D., *Professor of Oriental Languages (Chairman).*

Kan Lao, B.A., *Academician, Professor of Oriental Languages.*

Richard C. Rudolph, Ph.D., *Professor of Oriental Languages.*

Harmut E. F. Scharfe, Ph.D., *Professor of Indic Studies.*

Fr. Gerhard Schreiber, Ph.D., *Professor of Oriental Languages in Residence.*

* Not to be given, 1972-73.

‡ Recommended for students who elect the thesis plan.

Ensho Ashikaga, M.Litt., Giko, *Associate Professor of Oriental Languages.*

Ben Befu, Ph.D., *Associate 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.*

Shirleen S. Wong, Ph.D., *Assistant Professor of Oriental Languages.*



Y. C. Chu, M.A., *Lecturer in Chinese.*

Kuo-yi Pao (Unensečen), M.A., M.S., *Lecturer in Oriental Languages.*

George Takahashi, M.A., *Lecturer in Japanese.*

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, 13A-13B, and 40A; also History 9B and 9C. For the major in Japanese, courses 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, 122A, 122B, 124A, 124B, 124C, 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, 134A-134B, 137, 139, 142A, 142B, 153A-153B, 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 174 for 114C.

Recommended for Chinese majors: course 13C.

Recommended for both majors: Geography 186 and additional courses in history. Those planning to undertake graduate study are urged to include in their undergraduate pro-

gram three courses in classical Chinese or Japanese at the upper division level. Those planning to undertake advanced graduate study are urged to include five quarters of French or German (see also p. 150).

Requirements for Admission to Graduate Study

Students seeking admission to graduate status in Oriental Languages are expected to meet, in addition to 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. Students whose undergraduate preparation was not in the field of Oriental Languages will be admitted only if they can meet the departmental standards in linguistic competence and complete the minimum departmental requirements for the equivalent of an A.B. degree within the period of one year. 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 will not of itself be deemed sufficient commitment for students from those countries. Foreign students are required to attain a satisfactory score on the Test of English as a Second Language administered by the Educational Testing Service, and 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 148-149.

* On leave, Spring Quarter, 1973.

2. Demonstrate a reading knowledge of French or German by passing the Graduate School Foreign Language Test administered by the 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 these 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. All students will take comprehensive examinations in the areas of Chinese or Japanese 1) language and literature and 2) civilization. In addition, a brief research paper embodying the results of independent investigation will be required. The results of the examinations and the quality of the research paper will determine whether the student will be permitted to enter the Ph.D. program.

Requirements for the Ph.D. Degree

1. For general requirements, see page 151.

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 a M.A. degree or advanced graduate standing from another institution will not automatically be exempted from any part of our graduate program. He may be required to submit a brief research paper showing his ability to conduct original research and his aptitude in communicating his findings.

3. All students must present either Chinese or Japanese language and literature as a major in any program and will complete a minimum of five graduate courses in the department beyond the M.A. degree.

4. 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 Chinese or Japanese, i.e., Mongolian, Sanskrit, Tibetan. Recommended for those majoring 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).

5. All students will present a minor to be chosen with the approval of the graduate adviser. The minor may be in Buddhism, Chinese archaeology, Chinese language and literature (for Japanese majors), Japanese language and literature (for Chinese majors), or in an appropriate field outside of the department, such as art, English literature, history, linguistics, etc. A minimum of three courses at the upper division level followed by two graduate courses will constitute a minor. Students minoring in Buddhism will be required to have completed courses 139, 164A-164B, 168, 172A-172B, Oriental Languages 160 and 161 (Sanskrit). Those minoring in Chinese Archaeology will be required to have completed courses 170A-170B-170C and 188A-188B.

6. The student will demonstrate a reading knowledge of French or 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.

7. Pass qualifying examinations in the major field, the minor field and in East Asian history and culture. Pass an oral qualifying examination on the proposed dissertation topic and in appropriate related areas of study.

8. Present a dissertation embodying the results of independent investigation.

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

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

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 outstanding 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.

Mr. Chou, Mrs. Matsumaga

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, Mr. Pao

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, 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. Lao, Miss Wong

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

122A-122B. Readings in Modern Chinese Literature.

Lecture, four hours. Prerequisite: course 121B or consent of the instructor. Readings and discussion of masterpieces of modern Chinese literature. (A) poetry and prose; (B) drama and fiction.

Mr. Chou, Miss Wong

124A-124B-124C. 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: (A) Nationalist Chinese materials including the May 4th Movement; (B) Political and military materials of Communist China; (C) Economic and educational materials of Communist China.

The Staff

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

134A-134B. 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. Ashikaga, Mr. Befa

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: (A) Beginning to 1600; (B) 1600 to modern times.

Mr. Befa

142A-142B. Readings in Modern Expository Japanese.

(Formerly numbered 143A-143B.) Lecture, three hours. Prerequisite: course 119B. (A) Japanese social sciences. (B) Japanese history.

Mr. Epp

152. Chinese Poetry.

(Formerly numbered 152A.) Lecture, three hours. Prerequisite: course 113B. Readings and discussion of masterpieces of classical poetry.

Miss Wong

153A-153B. 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

154A-154B. Mongolian.

Lecture, three hours; laboratory, one hour. To be offered when requested by a sufficient number of students.

Mr. Pao

160. Elementary Sanskrit.

(Formerly numbered Indo-European Studies 160.) 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.

(Formerly numbered Indo-European Studies 161.) Prerequisite: course 160 or equivalent. Advanced aspects of grammar and the reading of literary texts.

Mr. Scharfe

162. Advanced Sanskrit.

(Formerly numbered Indo-European Studies 162.)
Prerequisite: course 161 or equivalent. In this course the entire Bhagavadgita or a comparable amount of other Sanskrit literature is read. Mr. Scharfe

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

165. Readings in Sanskrit.

(Formerly numbered Indo-European Studies 163.)
Prerequisite: course 162 or equivalent. Extensive reading in such texts as best serve the students' needs. Mr. Scharfe

166. Survey of Sanskrit Literature in Translation.

(Formerly numbered Indo-European Studies 168.)
A general course dealing with Sanskrit literature of India from Vedic times to the present. No knowledge of Sanskrit is required. Mr. Scharfe

167. Introduction of Indic Philosophy.

(Formerly numbered Indo-European Studies 167.)
A survey of the main trends in Indian philosophy from ancient to modern times. Mr. Scharfe

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. Matsumaga

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 catalogues. 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. Introduction to Buddhism.

No language requirement. The life and teachings of the Buddha, the monastic organization, Buddhist literature, the spread of the religion to the countries of southeast Asia, and contemporary Buddhist movements in those countries. Mr. Chen

172B. Development of Buddhism.

No language requirement. Rise of Mahayana Buddhism in India, important Mahayana doctrines, Mahayana literature, art, and the spread of Mahayana Buddhism to Tibet, China and Japan. Discussion of Madhyamika, Vijnaptivada, Tantric, T'ien-t'ai, Zen, and Pure Land schools. Mr. Ashikaga, Mr. Chen

Mr. Ashikaga, Mr. Chen

173. Chinese Buddhism.

(Formerly numbered 173A-173B.) No language requirement. The introduction and development of Buddhism in China, interaction between Buddhism and Chinese culture, rise of the Chinese schools of Buddhism such as Pure Land and Zen, contributions to Chinese culture. Mr. Chen

174. Japanese Buddhism.

No language requirement. The development of Buddhism in Japan and its influence on Japanese culture with emphasis on the arts. Mr. Ashikaga

175. 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

176. Readings in Mongolian.

(Formerly numbered 174.)

Mr. Pao

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. Befu

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. Befu

188A-188B. Chinese Paleography.

(Formerly numbered 198.) 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 this 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

199. Special Studies in Oriental Languages.

(½ 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. Lao

213. Chinese Buddhist Texts.

Mr. Chen

214A-214B. Pali and Prakrits.

(Formerly numbered Indo-European Studies 223A-223B.) A knowledge of Sanskrit equivalent to course 161, and consent of instructor. Grammatical studies and reading of texts. Comparative considerations. Mr. Scharfe

221A-221B. Introduction to Panini's Grammar.

(Formerly numbered Indo-European Studies 221.) Prerequisite: course 162 or equivalent. Reading of selected passages of the text with an introduction to Panini's technique. Mr. Scharfe

M222A-222B. Vedic.

(Formerly numbered Indo-European Studies 222A-222B.) Same as Near Eastern Languages (Persian Section) M222A-222B. Prerequisite: a knowledge of Sanskrit equivalent to course 162, and consent of instructor. Characteristics of the Vedic dialect and readings in the Rig-Vedic hymns.

Mr. Schmidt

223. History of the Japanese Language. The Staff**226. Seminar in Modern Japanese Poetry.**

Analysis of modern poetry to discern how poets respond to their tradition and how they deal with the problems of man, society, and nature. Mr. Epp

229A-229B. Japanese Buddhist Texts.

Mrs. Matrunaga

240. Advanced Chinese Classics.

Prose and poetry in the Classical Style. Mr. Lao

242A-242B. Japanese Classics.

242A. Prose and poetry up to 1600.

242B. Prose and poetry from 1600 to 1868.

Mr. Befu

245. Seminar in Modern Japanese Fiction. Mr. Epp**251. Seminar: Selected Topics in Chinese Literature.**

May be repeated for credit.

Miss Wong

252. Seminar: Selected Topics in Japanese Literature.

May be repeated for credit.

Mr. Befu

253. Seminar: Selected Topics in Japanese Buddhism.

(Formerly numbered 253A-253B.) May be repeated for credit.

Mr. Ashikaga

255. Seminar: Selected Topics in Chinese or Indian Buddhism.

May be repeated for credit.

Mr. Chen

262. Seminar in Sino-logical Literature. The Staff**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**293. Bibliography and Methods of Research in Chinese.**

Mr. Chou

296. Bibliography and Methods of Research in Japanese.

Mr. Befu

Professional Courses**301. Methods of Teaching an Oriental Language as a Foreign 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 the Comprehensive Examination for the M.A. or the Qualifying Examination for the Ph.D.

The Staff

599. Research for and Preparation of the Doctoral Dissertation. (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.

115C. Advanced Japanese Art.

260. Asian Art.

English. 110. Introduction to Poetry.

140. Criticism.

201. Approaches of Literary Criticism.

Geography. 186. Eastern Asia.

285. Asia.

290C. Seminar in Regional Geography: Eastern Asia.

History. 124A-124B. History of Religions.

191A-191D. History of China.

193. Diplomatic History of the Far East.

195A-195B-195C. Japanese History.

196A. Early History of India.

201B. Themes in Early and Modern Chinese History.

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.

282A-282B. Seminar in the history of Religions.

Linguistics. 103. Introduction to General Phonetics.

120A. Linguistics Analysis: Phonology.

120B. Linguistics Analysis: Grammar.

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.

136. International Relations of the Western Pacific Area.

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.*

William H. Carnes, M.D., *Professor of Pathology.*

Walter F. Coulson, M.D., *Professor of Pathology (Vice-Chairman of the Department).*

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.*

Julien L. Van Lancker, M.D., *Professor of Pathology (Chairman of the Department).*

Roy L. Walford, M.D., *Professor of Pathology.*

Louis J. Zeldis, M.D., *Professor of Pathology (Vice-Chairman of the Department).*

John M. Andrews, M.D., *Associate Professor of Pathology and Neurology in Residence.*

Pasquale A. Cancilla, M.D., *Associate Professor of Pathology (Vice-Chairman).*

Robert Y. Foos, M.D., *Associate Professor of Pathology.*

Lazaro E. Gerschenson, M.D., *Associate Professor of Pathology in Residence.*

David D. Porter, M.D., *Associate Professor of Pathology.*

M. Anthony Verity, M.D., *Associate Professor of Pathology.*

Rosemary D. Bevan, M.D., *Assistant Professor of Pathology in Residence.*

Ruth Gussen, M.D., *Adjunct Assistant Professor of Pathology.*

Gen Niwayama, M.D., *Assistant Professor of Pathology.*

Donald E. Paglia, M.D., *Assistant Professor of Pathology.*

Alan M. Roth, M.D., *Adjunct Assistant Professor of Ophthalmology and Pathology.*

George S. Smith, M.D., *Assistant Professor of Pathology.*

Thomas M. Stanley, M.D., *Assistant Professor of Pathology.*

Frans P. Van Roy, M.D., Ph.D., *Assistant Professor of Pathology in Residence.*

Jerry Waisman, M.D., *Assistant Professor of Pathology.*



Philip H. Cooper, M.D., *Acting Assistant Professor of Pathology.*

Joseph Raymond, M.D., *Lecturer in Pathology and Head of Clinical Laboratories.*

Marilyn J. Stein, M.D., *Lecturer in Pathology.*

Takanori Tomura, M.D., Ph.D., *Acting Assistant Professor of Pathology.*

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.

(½ course)

Prerequisite: regular graduate student status and completion of curriculum satisfying basic requirements for study of human pathology. Lectures, demonstrations and individual study of a student loan collection of microscopic slide preparations and of specimens from recent autopsies. Kodachrome

photomicrographs and projection of microslides will be presented. Concentration will be in the area of General Pathology. The Staff

231B-231C. Pathological Anatomy and Physiology. (1 course, ½ course)

Prerequisite: Regular graduate student status and completion of curriculum satisfying basic requirements for study of human pathology. Lectures, demonstrations and individual study of a student loan collection of microscopic slide preparations and of specimens from recent autopsies. Kodachrome photomicrographs and projection of microslides will be presented. Course of study includes special path-

ology of the organ systems, emphasizing the correlation of abnormal anatomy with deranged physiology and chemistry. A term paper may be required.

235A-235B-235C. Regulation of Gene Expression in Mammalian Cells. (½ course each)

Lecture, two hours; discussion, one hour. Prerequisites: consent of instructors. Description of intracellular information flow in mammalian cells by stimuli of different nature as well as induced changes such as induction, repression, differentiation and neoplastic transformation will be analyzed. Use of culture models and its biopathological implications will be stressed. Mr. Gerschenson, Mr. Van Roy

■ 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 (Vice-Chairman of the Department).*

William L. Hewitt, M.D., *Professor of Medicine and Pharmacology.*

Murray E. Jarvik, M.D., Ph.D., *Professor of Pharmacology and Psychiatry.*

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.*

Michael W. Whitehouse, Ph.D., *Professor of Pharmacology and Medicine in Residence.*

Robert O. Bauer, M.D., *Associate Professor of Surgery, Obstetrics and Gynecology and Pharmacology.*

Arthur K. Cho, Ph.D., *Associate Professor of Pharmacology.*

M. David Fairchild, Ph.D., *Adjunct Associate Professor of Pharmacology.*

Louis Levy, Ph.D., *Adjunct Associate Professor of Medicine and Pharmacology.*

Peter Lomax, M.D., D.Sc., *Associate Professor of Pharmacology.*

Jeremy H. Thompson, M.D., M.R.C.P.I., D.Sc., *Associate Professor of Pharmacology.*

Mark A. Goldberg, M.D., Ph.D., *Assistant Professor of Neurology and Pharmacology in Residence.*

Che Su, Ph.D., *Assistant Professor of Pharmacology in Residence.*



Joseph H. Beckerman, Pharm.D., *Lecturer in Pharmacology.*

Bjorn G. Lindeke, Ph.D., *Lecturer in 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.

Requirements for the Degree of Master of Science

Students entering graduate study in the Department of Pharmacology will be expected to pursue the Ph.D. degree. Exceptional cases may be considered for the degree of Master of Science. In those cases, candidates for the master's degree must meet the general requirements set by the Graduate Division for this degree.

Requirements for the Doctor of Philosophy Degree

Advancement to Candidacy. In addition to the general requirements of the Graduate Division, the student may be required to pass a series of qualifying examinations both written and oral. His departmental Guidance Committee may also stipulate additional requirements. This committee will be appointed by the Chairman of the Department.

The responsibility for completion of all technical requirements for the doctor's degree rests solely with the candidate.

Departmental Requirements. In addition to the general requirements of the Graduate Division the student must complete the following courses or their equivalents: Biological Chemistry 101A-101B-101C; Physiology 101-102; Histology; Pharmacology 202 (Pharmacological Basis of Therapeutics); Pharmacology 234A-234B-234C (Experimental Methods in Pharmacology); Pharmacology 236 (Neuropharmacology); Pharmacology 237 (Autonomic, Cardiovascular and Gastrointestinal Pharmacology); Pharmacology 238 (Introduction to Therapeutics); Pharmacology 241 (Introduction to Chemical Pharmacology); Pharmacology 242 (Advanced Chemical Pharmacology); Pharmacology 251 (Seminar); two quarters of Physical Chemistry; and courses in Calculus and Biostatistics.

Upon the completion of the first two years of study each student will be required to take a comprehensive oral examination at which time the student will be recommended 1) for continuation of his studies towards the Ph.D. degree; 2) for further remedial study or; 3) for termination.

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. Principles of Pharmacology and Toxicology.

Lectures. Prerequisite: mammalian physiology; biochemistry. A series of lectures on the principles governing interactions between drugs and biological systems, with particular attention to the application of these principles to the therapeutics and toxicology.

Mr. Jenden in charge

202. Pharmacological Basis of Therapeutics.

(2 courses)

Lectures, discussion, case presentations and laboratories. Prerequisite: Principles of Pharmacology and Toxicology. A detailed and systematic consideration of the principal categories of drugs, their mechanisms of action and the rationale for their therapeutic use.

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. Cho, Mr. George, Mr. Su

235. Systematic Pharmacology and Toxicology.

Prerequisite: Principles of Pharmacology and Toxicology. Lectures, discussion and directed private study of the principal categories of drugs, their pharmacological properties and mechanisms of action.

Mr. Jenden in charge

236. Neuropharmacology.

Prerequisite: neurophysiology. Advanced neuropharmacology, including actions and modes of action 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

237. Autonomic and Cardiovascular Pharmacology.

(½ course)

Prerequisite: Pharmacology 241 (Introduction to Chemical Pharmacology). A detailed consideration of the modes of action and the pharmacological and toxicological effect of drugs on the autonomic, cardiovascular and gastrointestinal systems.

Mr. Su, Mr. Bevan

238. Introduction to Therapeutics.

Prerequisite: Registration as a graduate student in the Department of Pharmacology and completion of the 1st year of studies, or consent of the instructor. A systematic consideration of the etiology, symptoms, signs and pathogenesis of the principal groups of diseases amenable to drug therapy.

Mr. Lomax, Mr. Thompson

* Not to be given, 1972-1973.

241. Introduction to Chemical Pharmacology.

(½ course)

Prerequisite: Organic and Biological Chemistry. Introduction to general principles of pharmacology. The role of chemical properties of drugs in their distribution, metabolism and excretion. Mr. Cho

242. Chemical Pharmacology. (½ course)

Prerequisite: Pharmacology 241 (Introduction to Chemical Pharmacology). Selected topics in Chemical Pharmacology. Mr. Cho

251. Seminar in Pharmacology. (½ course each)

Mr. Levy

***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. Cho

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. 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**586. 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.*Keith S. Donnellan, Ph.D., *Professor of Philosophy.*Donald Kalish, Ph.D., *Professor of Philosophy.*David Kaplan, Ph.D., *Professor of Philosophy.*Herbert Morris, LL.B., D.Phil., *Professor of Philosophy and Law.*Richard A. Wasserstrom, LL.B., Ph.D., *Professor of Philosophy and Law.*Robert M. Yost, Ph.D., *Professor of Philosophy.*Hugh Miller, Ph.D., *Emeritus Professor of Philosophy.*Ernest A. Moody, Ph.D., *Emeritus Professor of Philosophy.*J. Wesley Robson, Ph.D., *Emeritus Professor of Philosophy.*Montgomery Furth, Ph.D., *Associate Professor of Philosophy.*C. Tyler Burge, Ph.D., *Assistant Professor of Philosophy.*Thomas E. Hill, Jr., Ph.D., *Assistant Professor of Philosophy.*John R. Perry, Ph.D., *Assistant Professor of Philosophy.*Warren S. Quinn, Ph.D., *Assistant Professor of Philosophy.*_____, *Assistant Professor of Philosophy.*_____, *Assistant Professor of Philosophy.*_____, *Assistant Professor of Philosophy.*_____, *Assistant Professor of Philosophy.*_____, *Assistant Professor of Philosophy.*Laurent Beauregard, Ph.D., *Acting Assistant Professor of Philosophy.*Bernard Boxill, M.A., *Acting Assistant Professor of Philosophy.*William Schroeder, 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.

* Not to be given, 1972-1973.

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.

Group I. 101, 102, 104, 105, 106, 107, 108, 110; Group II. 125, 126A, 126B, 126C, 127A-127B, 128, 129, 133, 134, 135; Group III. 150A-150B, 151, 152, 155, 156, 160, 161, 164; Group IV. 175, 176, 178, 180, 184, 186, 188, 190, 192, 194.

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 148-149.

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.

First Year Program

Satisfactory completion of Philosophy 250A-250B-250C, 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.

† 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.

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 151-154.

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.

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.

For details of requirements for all graduate degrees in Philosophy, consult the Department's *Graduate Manual*, obtainable on request from the Department office.

* 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.

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. Hill, 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. Perry, Mr. Quinn, Mr. Yost

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

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. Donnellan, Mr. Perry

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. Kalish

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.

Mr. Boxill

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 Predecessors.

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.

Mr. Quinn

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

104. Hume.

Prerequisite: one course in philosophy or consent of the instructor. Selected topics from the metaphysical, epistemological and ethical writings of Hume. Mr. Quinn

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. Perry

107. Kant and Idealism.

Prerequisite: one course in philosophy or consent of instructor. A study of Kant as the basis for later German idealism. Mr. Hill

108. Nineteenth Century Philosophy.

Prerequisite: one course in philosophy or consent of the instructor. Selected topics in nineteenth century thought.

109. Late 19th and Early 20th Century Philosophy.

Prerequisite: one course in philosophy or the consent of the instructor. Selected topics in the work of one or more of the following philosophers: Bolzano, Frege, Husserl, Meinong, the early Russell and Wittgenstein. Mr. Burge

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 instructor; course 110 recommended. Advanced study of selected issues in Islamic philosophy.

112. 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.

113. 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.

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. Mr. Perry

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.

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.

128. Philosophy of Mathematics.

Prerequisite: course 32 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.

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. Mr. Kalish, Mr. Kaplan

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. Kalish

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, Mr. Kaplan

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. Kalish

151A-151B. History of Ethics.

Prerequisites: course 151A not a prerequisite for 151B. Two courses in philosophy or the consent of the instructor.

151A. Selected classics in earlier ethical theories.

151B. Selected classics in late ethical theories.

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. Hill

160. Philosophy of Art.

The aesthetic experience; form and expression; the functions of art; bases of art criticism.

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

164. Philosophy in Literature.

The study of philosophical ideas expressed in literature.

165. Philosophical Problems in Negritude.

Prerequisite: one course in philosophy or consent of the instructor. Analysis of philosophical problems raised by the idea of negritude, pan-africanism and related concepts.

Mr. Boxill

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.

177A. Existentialism.

Prerequisite: one course in philosophy or consent of the instructor. Analysis of the methods, problems, and views of some of the following: Kierkegaard, Nietzsche, Heidegger, Jaspers, Sartre, Marcel, and Camus. Possible topics: metaphysical foundations, nature of mind, freedom, problem of the self, other people, ethics, existential psychoanalysis.

177B. Phenomenology.

Prerequisites: two courses in philosophy or consent of instructor. 177A is not a prerequisite for 177B. Introduction to the phenomenological method of approaching philosophical problems via the works

of some of the following: Brentano, Husserl, Heidegger, Scheler, Sartre, Merleau-Ponty, Ricoeur. Topics fall in the areas of ontology, epistemology, and especially philosophy of mind.

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.

Mr. Yost

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.

Mr. Donnellan, Mr. Perry

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.

Mr. Donnellan

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.

Mr. Furth

NO GROUP**199. Special Studies. (½ to 2 courses)**

Prerequisite: consent of the instructor. As many as eight units of this course can be used for the philosophy major, but the course is not included in any of the four groups.

The Staff

Graduate Courses**GROUP I****201. Plato.**

A study of the later dialogues.

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.

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

206. British Empiricism.

Prerequisite: consent of the instructor. The same as British Empiricism in the upper division course.

207. Kant.

(Formerly numbered 208.) Prerequisite: consent of the instructor. An intensive study of selected writings of Immanuel Kant.

211. Nineteenth Century Philosophy.

Prerequisite: Consent of the instructor. Topics in nineteenth century philosophy.

GROUP II

M221A-221B-221C. Set Theory.

(Formerly numbered 231A-231B and same as Mathematics M221A-221B-221C.) Prerequisite: Mathematics 112A or Philosophy 134 or consent of the instructor. Students may not receive credit for both Mathematics M221A-221B-221C and Philosophy M221A-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-Cödel Theory. Constructability. Results on relative consistency and independence.

222A-222B. Gödel Theory.

222A. Second-order arithmetic. Prerequisite: 261, or three previous courses in logic. First in a series of three courses leading up to Gödel incompleteness theorem and Tarski's definition of truth.

222B. Gödel numbering and Gödel theory. Prerequisite: 222A. Second in the same series of three courses.

223. Model Theory.

Prerequisite: course 135 or Mathematics 112A-112B.

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.

Graduate Seminars

250A-250B-250C. Seminar for First Year

Graduate Students.

Prerequisite: open only to first-year students in philosophy. 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.

251B. Seminar: History of Medieval and Renaissance Philosophy.

Prerequisite: consent of the instructor. Selected problems and philosophers.

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. Mr. Kaplan

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, Mr. Quinn

272. Seminar: Political Theory.

Prerequisite: consent of the instructor.

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

278. Seminar: The Emotions.

Topics in moral psychology.

GROUP IV

280. Seminar: Phenomenology.

Prerequisite: consent of the instructor.
Mr. Donnellan, Mr. Perry

282. Seminar: Metaphysics.

Prerequisite: consent of the instructor.

283. Seminar: Theory of Knowledge.

Prerequisite: consent of the instructor. Mr. Yost

284. Seminar: Philosophy of Perception.

Prerequisite: consent of the instructor. Mr. Yost

286. Seminar: Minds and Machines.

Prerequisite: consent of the instructor. Mechanism, vitalism; minds and machines since Descartes; computer simulation, artificial intelligence, and philosophical analysis.

287. Seminar: Philosophy of Language.

Prerequisite: consent of the instructor. Mr. Furth

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.

($\frac{1}{2}$ 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.

($\frac{1}{2}$ to 2 courses)

Independent study in preparation for examination. May be repeated for credit. Graded only on a satisfactory/unsatisfactory basis. The Staff

599A-599B. Research for Doctoral Dissertation.

($\frac{1}{2}$ 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 (Vice Chairman of the Department).*

Donald T. Handy, Ed.D., *Associate Professor of Physical Education (Chairman of the Department).*

Jack F. Keogh, Ed.D., *Associate Professor of Physical Education.*

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.*
 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

The requirements for and offerings in the major are intended to develop and integrate principles and concepts of human movement (Kinesiology). Upper division courses consist of a common core of requirements for all majors and are grouped into three areas of subsequent concentration which focus on the Department's concern with various aspects of human movement. The core courses in Area I emphasize the biochemical, morphological and general physiological adaptations of man to exercise and environmental conditions. Area II core courses are concerned primarily with the description of movement and the neuromuscular and biomechanical determinants of motor performance, while core courses in Area III focus on the development, acquisition and modification of motor performance.

The major provides a basic education for students who are planning careers in the area broadly defined as physical education, physical or occupational therapy, perceptual-motor education, and other occupations which demand knowledge of human movement. Students intending to major in Kinesiology must confer with a departmental adviser before enrollment in classes, and declaration of an area of concentration must be made prior to the end of the junior year.

The 370 course is a prerequisite for the student teaching experience in Physical Education which in turn is a requirement for those expecting to obtain a California State teaching credential. All students who have secondary school teaching as a career objective are required to complete, *prior* to enrollment in the 370 course, six (6) physical education skill courses, or the equivalent, in the following activities. (a) Track and Field, (b) Gymnastics, (c) Two team sports, (d) Two individual activities including dance. Selection of courses and equivalency should be discussed with a departmental adviser.

No students will be permitted to graduate under the requirements of the major in effect during the 1971-72 Academic Year after the Summer of 1974.

Preparation for the Major

Three lower division departmental courses including 12, 14 and 16 are introductory courses in each of cellular biology (2 or 1A), chemistry, physics and statistics. In addition, one introductory course from two of the following departments are required: psychology, anthropology, philosophy and sociology. Students emphasizing Area I must have a strong background in chemistry and mathematics and are required to take Chemistry 1A-C, 4A-C, 6A-C and Mathematics 3A-B.

The Major

†Departmental courses—108, 110, 111, 130, 131, 150, 151 and two additional courses from one area of concentration (I, II or III). Also, students emphasizing Areas II and III are required to take four elective upper division courses from any departmental offering except 101A, 101B, 102, 370, 401 or 402. Students emphasizing Area I are required to elect only one additional course.

Three extra departmental courses which are related to the student's area of concentration are required. Lists of approved courses for each area of concentration (I, II or III) are available in departmental offices. Students are required to work closely with a departmental adviser in selecting the related courses. Advisers may be contacted initially by making inquiry in WC 124.

Upon completion of the Bachelor's degree the student 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 page 90.

† Major and minor students may take departmental courses, beyond requirements on a pass/fail basis.

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.) All students who are interested in completing a Teaching Minor must consult with a departmental adviser in WG 124.

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 31. 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 pages 150-151) 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.

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. Pillich in charge

2A-2Z. Human Performance (Men and Women).

(½ 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. Unless otherwise specified, all sections are coeducational.

Miss Martin in charge

12. Introduction to Human Physiology.

(Formerly numbered 15B.) Prerequisite: Physical Science M1 and M2; Biology 2; or consent of the instructor. An introduction to human physiology.

Mr. Edgerton

14. Human Neuromuscular Anatomy.

(Formerly numbered 15A.) Prerequisite: Physical Science M1 and M2 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. Miss Smith

16. Human Motor Performance.

(Formerly numbered 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.

The Staff

Upper Division Courses**101A-101B. Elements of Kinesiology.**

(Formerly numbered 111A-111B.) Lecture four hours. Not open to Physical Education major students. 101A must be completed prior to enrollment in 101B. 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

† 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.

102. Nature and Theory of Movement Experience for Children.

(Formerly numbered 121.) Lecture, three hours; laboratory, two hours. Prerequisite: Consent of the instructor. Not open to Physical Education major students. Exploration of varied, graded and sequential physical activities for children. Miss Latchaw

108. History of Kinesiology.

(Formerly numbered 148.) Prerequisite: Upper division standing or consent of the instructor. Challenges, continuity, and change underlying human movement programs. Mr. B. Miller

109. History of Physical Education in California.

(Formerly numbered 149.) Prerequisite: Upper division standing and consent of the instructor. Challenges, continuity, and change underlying physical education programs in California during the past century. Mr. B. Miller

Area I: Biomechanical, morphological, and general physiological adaptations of man to exercise and environmental conditions

110. Exercise Physiology.

(Formerly numbered 110B.) Prerequisites: PE 16, Biology 1A-1B or 2 and PE 14, 15; Physical Sciences M1 and M2 or Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Math 50, Psychology 41 or Sociology 18 (may be taken concurrently with 130). Relationship between man's movement and his structure, function and behavior.

Mr. Egstrom, Mr. Gardner, Miss V. Hunt

111. Laboratory in Exercise Physiology. (1/4 course)

Prerequisites: PE 10, Biology 1A-1B or 2 and Physical Education 14 and 16; Physical Science M1 and M2 or Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Math 50, Sociology 19 or Psychology 41. Course 111 may be taken concurrently with 110.

The Staff

117. Conditioning for Maximum Performance.

Prerequisite: Courses 110, 111, 130, 131 or consent of the instructor. Study of factors and conditions accelerating and retarding levels of performance and work under various physiological and environmental conditions. Mr. Morehouse

118. Cellular Dynamics of Exercise.

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. Laboratory in Cellular Dynamics. (1/4 Course)

Prerequisite: Courses 110, 111, 130, 131.

Mr. Edgerton

Area II: Description of human movement and the neuromuscular and biomechanical determinants of motor performance

130. Applied Anatomy and Biomechanics.

(Formerly numbered 110A.) Prerequisites: Physical Education 16; Biology 1A-1B or 2 and Physical Education 12 and 14; Physical Sciences M1 and M2 or Chemistry 1A-1B-1C, 4A-C, 6A-C; Math. 50, Psychology 41 or Sociology 18. (May be taken con-

currently with 131.) Relationship between man's movement and his structure, function and behavior.

Mr. Egstrom, Mr. Gardner, Miss V. Hunt

131. Laboratory in Applied Anatomy and Biomechanics. (1/4 course)

Prerequisites: Physical Education 10; Biology 1A-1B or 2 and Physical Education 14 and 16; Physical Sciences 1 and 2 or Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Math 50, Psychology 41 or Sociology 19. May be taken concurrently with 130.

The Staff

134. Assessment of Human Movement Skill.

(Formerly numbered 113.) Lecture 4 hours. Prerequisite: Courses 110, 111, 130, 131. Analysis and evaluation of movement skills under varying environmental conditions. Mr. Egstrom, Miss Smith

137. Therapeutic Exercise.

(Formerly numbered 114.) Lecture 4 hours. Prerequisite: 110, 111, 130, 131. The role of exercise in the improvement of movement in physically handicapped individuals. Care and prevention of athletic injuries. Mr. Gardner, Mr. Handy

140. Mechanisms of Neuromuscular Control.

(Formerly numbered 115.) Prerequisites: Physical Education 14, 120 and Psychology 15. Neuromuscular mechanisms of motor behavior with special emphasis on the neural correlates of volitional movement and skilled motor patterns. Some emphasis on neurologically handicapped and motor dysfunction.

Miss Smith

145. Analysis of Expressive Movement.

(Formerly numbered 112.) Lecture 4 hours. Prerequisites: Courses 110, 111, 130, 131 or consent of instructor. Interpretation of the expressive aspects of human movement.

Miss V. Hunt

Area III: Development, acquisition and modification of human motor performance

150. Motor Performance and Skill Acquisition.

(Formerly numbered 125.) An examination of motor performance and motor learning, and the influence of selected psychological variables upon human movement.

Mr. Cratty

151. Laboratory in Motor Performance and Skill Acquisition. (1/4 course)

Prerequisite: Must be taken concurrently with course 150. Laboratory in motor performance and skill acquisition.

Mr. Cratty

160. Human Movement Development.

(Formerly numbered 120.) Prerequisite: Upper division standing. Movement development throughout life with emphasis upon individual and societal determinants.

Mr. Keogh

165. Perceptual Motor Education.

(Formerly numbered 122.) Prerequisites: Courses 100, 111, 130, 131, course 120 recommended. Movement problems of the minimally-neurologically handicapped with emphasis on the clumsy-child syndrome.

Mr. Cratty

170A-170B. Theoretical Aspects of Play, Leisure and Recreation.

(Formerly numbered 139A-139B.) Prerequisite: Upper division standing and consent of the instructor.

tor. A consideration of the historical development, philosophical concepts and social forces influencing leisure and recreation in American life. Mrs. Arnold

175. Sports in American Life.

(Formerly numbered 136.) Prerequisite: junior standing and consent of the instructor. The national and international roles and interrelationships of American sports emphasizing socio-cultural values, changing patterns, current trends, problems and issues. Mrs. Bell, Mr. Snyder

190. Field Studies. (½ to 1 course)

Prerequisite: consent of the instructor. The Staff

193. Kinesiometrics.

Prerequisite: senior standing and 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. Mr. Snyder

220. Exercise Physiology.

(Formerly numbered 267.) Response of organs and systems to exercise, and physiological mechanisms underlying elements of human performance. Mr. Egstrom, 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

228. Intelligence and Motor Activity.

Prerequisites: One course from: Courses 120, 122, 125, 227; or consent of instructor. An overview of the theories and practices which combine intellectual and motor activity. Mr. Cratty

231. Environmental Kinesiology.

Modifications of human movement and kinesiological adaptations to physical environments.

Mr. Egstrom, 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. B. 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. Mr. B. Miller

275. Research in Human Movement.

Application of research designs to problems in human movement. The Staff

280A-280G. 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. Psychology and the Superior Athlete. Prerequisites: Physical Education 227 and consent of instructor. Mr. Cratty

280F. Leisure and Recreation Modifiers. Mrs. Arnold

280G. Neuromuscular Mechanisms and Motor Performance. Miss Smith

290A-290B. Seminars in Neuromuscular Control.

Prerequisites: Physical Education 115 and 118; or consent of the instructor. Selected topics on the muscular and neural determinants of movement behavior. Mr. Edgerton, 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. Departmental 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

M1. Physics.

(Same as Physics M10.) Lecture and demonstration, three hours; quiz and discussion, one hour. No special mathematical preparation is required. This course satisfies in part the College of Letters and Science E requirement in the physical sciences for non-physical science majors. Topics will be selected from: Planetary motion, Newton's Laws, gravitation, electricity and magnetism, wave motion, light, sound and heat, relativity, quantum mechanics, atoms, and subatomic particles. As time permits, the development of physical ideas will be placed in their cultural and historical perspective.

M2. Chemistry.

(Same as Chemistry M2.) 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

M36. Geology.

(Same as Geology M1.) 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

M3M. Meteorology.

(Same as Meteorology M3.) Lecture, three hours; laboratory, two hours. 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.*

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.*

Roy P. Haddock, Ph.D., *Professor of Physics.*

Theodore Holstein, Ph.D., *Professor of Physics.*

George J. Igo, Ph.D., *Professor of Physics.*

Charles Kennel, Ph.D., *Professor of Physics.*

* Not to be given every year.

- 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 (Chairman of the Department)*.
 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*.
 Eugene Wong, Ph.D., *Professor of Physics*.
 Byron T. Wright, Ph.D., *Professor of Physics*.
 Carl M. York, Ph.D., *Professor of Physics*.
 Hans E. Bommel, 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*.
 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. Drickey, 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*.
 Chun Wa Wong, Ph.D., *Associate Professor of Physics*.
 Charles D. Buchanan, Ph.D., *Assistant Professor of Physics*.
 Seth J. Putterman, Ph.D., *Assistant Professor of Physics*.
 Don Villarejo, Ph.D., *Assistant Professor of Physics*.
 Charles A. Whitten, Ph.D., *Assistant Professor of Physics*.
 Norman W. Albright, Ph.D., *Adjunct Assistant Professor of Physics*.
 Ferdinand V. Coroniti, Ph.D., *Adjunct Assistant Professor of Physics*.
 Madhu S. Dixit, Ph.D., *Adjunct Assistant Professor of Physics*.
 N. D. Hari Dass, Ph.D., *Adjunct Assistant Professor of Physics*.
 Arthur D. Liberman, Ph.D., *Adjunct Assistant Professor of Physics*.
 Barrett H. Ripin, Ph.D., *Adjunct Assistant Professor of Physics*.
 F. David Rudnick, Ph.D., *Adjunct Assistant Professor of Physics*.
 Paul F. Shepard, Ph.D., *Adjunct Assistant Professor of Physics*.
 Daniel I. Sober, Ph.D., *Adjunct Assistant Professor of Physics*.
 Reiner L. Stenzel, Ph.D., *Adjunct Assistant Professor of Physics*.
 ———, *Assistant Professor of Physics*.
 ———, *Assistant Professor of Physics*.
 ———, *Assistant Professor of Physics*.



S. Merton Burkhard, M.S., *Lecturer in Physics*.
 Julian Schwinger, Ph.D., *Visiting Professor of Physics*.

•• Member of the Institute of Geophysics and Planetary Physics.

Ivo Slaus, Ph.D., *Visiting Professor of Physics.*

Jules W. Sunier, Ph.D., *Acting Associate 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 following courses are required: Physics 105A, 105B, 110A, 110B, 112A, 115A, 115B, 131A, three courses from the Physics 180 series; three additional upper division physics lecture courses selected from Physics 108, 112B, 113, 114, 115C, 122, 124, 126, 131B and 140. An upper division course in Mathematics may be substituted for Physics 131B *upon approval of 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.

Students preparing for graduate school should take additional courses in physics and mathematics. Physics 113, 122, 124, 126, and 140 are recommended.

The Major in General Physics

This major leads to the degree "B.A. in General Physics." It is intended to provide the necessary flexibility for those students who are interested in fields which can benefit from a strong background of knowledge of physics. Those students who intend to continue work in the Ph.D. in physics are advised to work for the B.S. in physics as described under the "Major in Physics." The course requirements for the B.A. in General Physics are as follows: Physics 105A, 110A, 110B, 112A, 115A, 131A, one course from the 180 series, two upper division physics electives (excluding 121, 185, 198, and 199), and five upper division courses in no more than two departments other than physics. A "C" average in the upper division physics courses is required.

† See explanation of lower division courses on page 477.

‡ A mimeographed brochure giving more detailed information than is contained in this bulletin is obtainable from the Office of Undergraduate Affairs, Department of Physics.

§ A brochure giving additional information of interest to graduate students in physics is obtainable from the Office of Graduate Affairs, Department of Physics.

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 Sciences

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.

The Master of Arts, Teaching (M.A.T.) Degree

This degree leads to qualification for teaching credentials at the secondary school or junior college level. The program consists of at least five graduate physics courses, four of

which are chosen from 231A, 220A, 215A, 210A, or 221A; five additional graduate or upper division courses in physics and education; and a special physics teaching laboratory, Physics 370. For those who have not completed credential requirements, the five additional courses will include Education 100 or 108, 112, 130, and 330 (supervised teaching at the secondary or junior college level). In addition, the student must pass a comprehensive physics examination. 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 151-154. The qualifying examinations for candidates for the Ph.D. degree in physics include (1) a written comprehensive examination; (2) the 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.

Normal Progress for Graduate Students. The normal schedule of progress toward the Ph.D. degree is as follows: the written comprehensive examination should be taken by the fourth quarter in residence at UCLA; examinations in the five fundamental courses should be completed no later than the end of the fifth quarter; a specialized course of study should begin during the second year; the comprehensive oral examination should be completed no later than the eighth quarter, and the oral qualifying examination (advancement to candidacy) no later than the end of the eleventh quarter; the dissertation and final oral examination should be finished during the fourth and fifth years.

Lower Division Courses

Physics 1Q, Contemporary Physics, is intended for entering freshmen physics majors, and will normally be taken in the first quarter of residence. There are no course prerequisites. Although it is not a required course or a part of or prerequisite to any general

physics sequence of courses, it serves a purpose which general introductory courses do not fulfill adequately, if at all, namely to indicate the nature of current research problems in physics.

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).

Physics 7AH-7BH-7CH-7DH is an honors sequence intended for students with an outstanding record in high school science courses and a deep interest in physics. This sequence covers the same material as the Physics 7A-7B-7C-7D sequence but in greater depth.

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 examination with a class at the end of any quarter. These will serve as placement examinations. Qualified students are urged to discuss such possibilities with their advisers.

Physics 3A-3B-3C 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.

The associated laboratory courses 3AL, 3BL, 3CL, carrying one-quarter course credit each (1 unit) are offered to accompany the 3A, B, C lectures. The laboratory is not required for the 3A, B, C lecture course. It is offered for those who need a physics course with laboratory to meet entrance requirements into other programs. The student is responsible to know whether or not he needs the laboratory.

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 3A-3B-3C, 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

§ A brochure giving additional information of interest to graduate students in physics is obtainable from the Office of Graduate Affairs, Department of Physics.

bacteriology majors will be required to complete the physics 6A-6B-6C sequence.

Physical Sciences 1, also called Physics 10, 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 non-physical science majors. Any combination of one of Physics 5, M10, 3A, 3A plus 3AL, or Physical Sciences 1 (Physics M10) with either Physics 6A or 7A shall be limited to six units credit.

Lower Division

Physical Sciences M1. Physics.

See Physical Sciences, page 473.

1Q. Contemporary Physics. (½ course)

Prerequisite: a major in physics. A review of current problems in physics with emphasis on those being studied in our research laboratories at UCLA. The significance of the problems and their historical context.

3A. 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 3A is not open for credit to students who have credit for Physics 7A or the equivalent. Students whose major or curriculum requires a year of Physics with laboratory should enroll in 3A, 3B, 3C, and 3AL, 3BL, and 3CL. The fundamentals of classical mechanics: Newton's Laws; conservation of momentum, angular momentum, energy; Kepler's Laws; dynamics of systems of particles; fluid mechanics.

3B. General Physics: Heat, Sound and Electricity and Magnetism.

Lecture and demonstration, four hours. Prerequisite: course 3A or equivalent. Temperature, heat and the laws of thermodynamics. Introduction to wave motion, resonance. Sound and acoustics. Electric and magnetic fields. Electric power. Elements of DC and AC circuits.

3C. General Physics: Light, Relativity, and Modern Physics.

Lecture and demonstration, four hours. Prerequisite: course 3B or equivalent. Light, optical instruments. Introduction to relativity. The electron and the atom. Matter waves. Nuclear and particle physics.

3AL. Mechanics Laboratory. (¼ course)

Laboratory, two hours per week. Prerequisite: completion of or concurrent enrollment in Physics 3A.

3BL. Heat, Sound and Electricity and Magnetism Laboratory. (¼ course)

Laboratory, two hours per week. Prerequisite: completion of or concurrent enrollment in Physics 3B.

3CL. Light, Relativity, and Modern Physics

Laboratory. (¼ course)

Laboratory, two hours per week. Prerequisite: completion of or concurrent enrollment in Physics 3C.

5. Introduction to University Physics.

A college level course designed to serve as a bridge to the Physics 6 or 7 sequence. It is aimed at that portion of the student population whose educational backgrounds have precluded a traditional scientific base. Credit for both Physics 5 and 6A or 5 and 7A is limited to 6 units.

6A. Physics for Life Science Majors: Mechanics and Wave Motion.

Lecture and demonstration, four hours; laboratory, two 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-discussion sections in small classes, four hours; lecture-demonstration, one hour. Prerequisite: high school physics or chemistry, preferably both; Mathematics 11A completed and 11B concurrent with Physics 7A; or equivalent courses.

7AH. General Physics: Mechanics of Solids-Honors Sequence.

Lecture-discussion sections in small classes, four hours; lecture-demonstration, one hour. This course, intended for students with an outstanding record in high school science courses and a deep interest in physics, covers the same material as Physics 7A but in greater depth. Prerequisites: Mathematics 11A (or preferably 11AH) completed and 11B (or preferably 11BH) concurrent with Physics 7AH; or equivalent courses. Enrollment in Physics 7AH rather than 7A is left to the judgment of the student. In case of doubt, consult the instructor scheduled to give the course.

†7B. General Physics: Electricity and Magnetism.

(Formerly numbered 1C.) Lecture and demonstration, four hours; laboratory, two hours; discussion, one hour. Prerequisite: course 7A; Mathematics 11B completed and 11C concurrent with Physics 7B; or equivalent courses.

7BH. General Physics: Electricity and Magnetism-Honors Sequence.

Lecture and demonstration, four hours; laboratory, two hours; discussion, one hour. This course

† Life sciences 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.

covers the same material as 7B but in greater depth. Prerequisites: course 7AH or 7A with a grade of A or the recommendation of the 7A instructor; Mathematics 11B (or preferably 11BH) completed and 11C (or preferably 11CH) concurrent with 7BH; or the consent of the instructor.

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 7B; Mathematics 11C completed and 12A concurrent with Physics 7C; or equivalent courses.

7CH. General Physics: Mechanics of Fluids, Heat and Sound-Honors Sequence.

Lecture and demonstration, three hours, laboratory, two hours; discussion, one hour. This course covers the same material as 7C but in greater depth. Prerequisites: course 7BH or course 7B with a grade of A or the recommendation of the 7B instructor; Mathematics 11C (or preferably 11CH) completed and 12A (or preferably 12AH) concurrent with Physics 7CH; or the consent of the instructor.

7D. General Physics: Light and Modern Physics.

(Formerly numbered 1D.) Lecture and demonstration, three hours; laboratory, two hours; discussion, one hour. Prerequisite: course 7C; Mathematics 12A completed and 12B concurrent with Physics 7D; or equivalent courses.

7DH. General Physics: Light and Modern Physics-Honors Sequence.

Lecture and demonstration, three hours; laboratory, two hours; discussion, one hour. This course covers the same materials as 7D but in greater depth. Prerequisites: course 7CH or course 7C with a grade of A or the recommendation of the 7C instructor; Mathematics 12A (or preferably 12AH) completed and 12B (or preferably 12BH) concurrent with Physics 7DH; or the consent of the instructor.

M10. Physics.

(Same as Physical Sciences M1.) Lecture and demonstration, three hours; quiz and discussion one hour. No special mathematical preparation is required. This course satisfies in part the College of Letters and Science E requirement in the physical sciences for non-physical science majors. Topics will be selected from: Planetary motion, Newton's Laws, gravitation, electricity and magnetism, wave motion, light, sound and heat, relativity, quantum mechanics, atoms, and subatomic particles. As time permits, the development of physical ideas will be placed in their cultural and historical perspective.

Upper Division Courses

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 sys-

tems, gravitational potentials, linear and nonlinear oscillations.

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 131A. 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 181 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 131A (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

* Not to be given, 1972-1973.

† Life sciences 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.

characteristics and parameters, transistor characteristics and parameters, amplifiers, oscillators, nonlinear 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.

M122. Plasma Physics.

Prerequisite: course 100B for Engineering students only; or 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.

131A. Mathematical Methods of Physics.

Vector differential operators. Partial differential equations of physics; Bessel functions; Legendre functions. Fourier series. Integral transforms. Complex variables.

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.

*180B. Physical Optics and Spectroscopy Laboratory. (1 course)

*180C. Solid State Physics Laboratory.

*180D. Acoustics Laboratory.

*180E. Plasma Physics Laboratory.

*180F. Elementary Particle Physics Laboratory.

*185. Foundations of Physics.

Prerequisite: senior standing in physics or consent of the instructor. The historical development and philosophical sources of classical and modern physics.

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.

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. Statistical Physics.

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.

* Not to be given every year.

† Enrollment is limited and controlled. For details consult the Office of Undergraduate Affairs.

***220B. Mechanics of Continuous Media.**

Stress-strain relations. Dynamic elasticity. Hydrodynamic 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.

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.

Students may not receive credit for both Physics 231B and Mathematics 266B. Ordinary differential equations, partial differential equations, and integral equations. Calculus of variations.

231C. Methods of Mathematical Physics.

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

* Not to be given every year.

cryogenics designed to train the student in the techniques and instrumentation used in acoustic research and low temperature physics.

290. Research Tutorial in Plasma Physics.

Seminars and discussion by staff and students, directed toward problems of current research interest in the plasma physics group, both experimental and theoretical. Each graduate student doing research in plasma physics will be required to take three quarters of Physics 290, ordinarily during his second or third year.

291. Research Tutorial in Elementary Particle Theory.

Prerequisite: 226A, 230A, and 230B. Seminars and discussion by staff, postdoctoral fellows, and graduate students enrolled in this course. Each graduate student doing research in elementary particle theory is required to take this course, ordinarily in his second or third year of study. May be repeated for credit.

292. Research Tutorial in Spectroscopy, Low Temperature, and Solid State Physics.

Seminars and discussion by staff and students on problems of current research interest in spectroscopy, low temperature, and solid state physics. Each graduate student doing research in these fields is required to take this course, ordinarily during his second or third year. May be repeated for credit.

295. Research Tutorial in Solid Earth Physics.

Seminars and discussions in solid earth physics. Each physics graduate student doing research in solid-earth physics is required to take this course, or Physics 292 if appropriate, ordinarily in his second or third year of study. May be repeated for credit.

298. Research Tutorial in Experimental Elementary Particle Physics.

Seminars and discussions by staff and students on current problems in experimental elementary particle physics. Each graduate student doing research in this field is required to take this course, ordinarily during his second or third year. May be repeated for credit. Enrollment limited to six students.

299. Research Tutorial in Nuclear Physics.

Seminars and discussions in nuclear physics by staff and students, in both experiment and theory. Each graduate student doing research in nuclear physics is required to take this course, ordinarily during his second or third year. May be repeated for credit.

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 473.

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)

■ PHYSIOLOGY

(Department Office, 53-247 Center for the Health Sciences)

W. Ross Adey, M.D., *Professor of Anatomy and Physiology.*

Allan J. Brady, Ph.D., *Professor of Physiology.*

Jared M. Diamond, Ph.D., *Professor of Physiology.*

George Eisenman, M.D., *Professor of Physiology.*

Morton I. Grossman, M.D., Ph.D., *Professor of Physiology and Medicine.*

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).*

William D. Odell, M.D., Ph.D., *Professor of Medicine and Physiology in Residence.*

Gordon Ross, M.D., *Professor of Medicine and Physiology.*

Daniel H. Simmons, M.D., Ph.D., *Professor of Medicine and Physiology.*

Ralph R. Sonnenschein, M.D., Ph.D., *Professor of Physiology.*

Bernice M. Wenzel, Ph.D., *Professor of Physiology and Psychiatry (Vice-Chairman of the Department).*

Fred N. White, Ph.D., *Professor of Physiology.*

William S. Yamamoto, M.D., *Professor of Biomathematics and Physiology.*

Mary A. B. Brazier, Ph.D., D.Sc., *Emeritus Professor of Anatomy and Physiology in Residence.*

John Field, Ph.D., *Emeritus Professor of Physiology and Medical History.*

Victor E. Hall, M.D., *Emeritus Professor of Physiology.*

Allan Hemingway, Ph.D., *Emeritus Professor of Physiology.*

Claude Baxter, Ph.D., *Adjunct Associate Professor of Physiology.*

Jennifer S. Buchwald, Ph.D., *Associate Professor of Physiology in Residence.*

Michael H. Chase, Ph.D., *Adjunct Associate Professor of Physiology.*

Sergio Ciani, Ph.D., *Associate Professor of Physiology.*

Robert S. Eisenberg, Ph.D., *Associate Professor of Physiology.*

Eduardo H. Rubinstein, M.D., Ph.D., *Associate Professor of Physiology in Residence.*

John McD. Tormey, M.D., *Associate Professor of Physiology.*

Donald O. Walter, Ph.D., *Associate Professor of Anatomy and Physiology in Residence.*

Charles D. Woody, M.D., *Associate Professor of Physiology, Anatomy in Residence.*

Ernest M. Wright, Ph.D., *Associate Professor of Physiology.*

Henry L. Batsel, Ph.D., *Adjunct Assistant Professor of Physiology.*

Solon Holstein, Ph.D., *Adjunct Assistant Professor of Physiology.*

Earl Homsher, Ph.D., *Assistant Professor of Physiology.*

Douglas Junge, Ph.D., *Assistant Professor of Oral Biology and Physiology.*

Gabor Szabo, Ph.D., *Assistant Professor of Physiology.*

Brian Whipp, Ph.D., *Adjunct Assistant Professor of Physiology.*



Sigmund T. Rich, D.V.M., *Lecturer in Physiology.*

Warren Sanborn, Ph.D., *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 11A-11B-11C). 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, physical 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.

Master of Science Degree

Students entering graduate study in the Department of Physiology will normally be expected to pursue the Ph.D. degree only. 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 148-149).

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 151).

Departmental Requirements. Course requirements ordinarily are: (1) Physiology 200 (2) Physiology 202; (3) Physical Chemistry 110A, 110B; (4) Physiology 101 (Neuromuscular and Cardiovascular Physiology); (5) Physiology 102 (Renal, Respiratory and Gastrointestinal Physiology); (6) Physiology 221, 222, 223 (Graduate Commentary); (7) Biological Chemistry 101A, 101B, and 101C or Chemistry 153 (Biochemistry); (8) Zoology 111 (Functional Ultrastructure of Cells); (9) Physiology 213 (Linear Analysis of Living Systems); (10) Physiology 224 (Physiology of Nerve Cells).

At the completion of the first year of study students will normally take the Department Written Exam at which time the student will be 1) recommended for continuation of his studies toward the Ph.D. degree, 2) recommended for further remedial study or 3) terminated. Near the completion of the second year of study the student may elect to take a Departmental Oral exam (optional) or to waive this exam and proceed directly to the University Qualifying Oral Examination (mandatory) administered by the student's graduate committee.

The student should begin his research work as soon as he has completed his basic program and selected a sponsor.

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 151-154).

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. Rubinstein and Staff**

101. Neuromuscular and Cardiovascular Physiology. (1½ courses)

Prerequisites: Basic courses in chemistry, physics, and biology, at least one year each; organic chemistry; histology; gross anatomy, human or comparative. Primarily for first year medical students, but open to others with consent of the instructor. Lectures, laboratory and conferences. An analysis of the electrical properties of muscle and nerve, the contractility of muscle and the heart, and the cardiovascular system and its regulation. **Mr. Tormey and the Staff**

102. Renal, Respiratory and Gastrointestinal Physiology. (1½ 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 respiration, and the distribution of water, electrolytes and metabolites by the renal and gastrointestinal systems, and the special physiology of certain organs. **Mr. Tormey 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. **Ms. Buchwald**

105N. Elementary Physiology.

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. **Ms. Seraydarian**

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. Permeability of Biological Membranes to Non-electrolytes. (½ course)

Prerequisite: consent of the instructor. A survey of passive and active transport of non-electrolytes across cell membranes. The topics to be considered include the composition and structure of membranes, the molecular and atomic forces controlling passive permeation, the significance of permeation through pores, and the mechanisms of sugar and amino acid transport. **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. **The Staff**

202. Permeability of Biological Membranes to Ions. (½ course)

Prerequisites: Chemistry 113B and 113C or the equivalent, or consent of the instructor. Topics include: ion permeation mechanisms, ion distribution, and physical basis of ion discrimination across cell membranes. **Mr. Diamond**

203. Neurophysiology. (½ course)

Prerequisites: Same as for course 103. 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. Sonnenschein, Mr. White**

207. 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. **Ms. 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. (¼ course)

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. (¼ course)

Prerequisite: consent of the instructor. Mathematical analysis of neuronal systems, with emphasis on stochastic models of nervous activity. Mr. Walter

210A-210B-210C. Basic Foundation in Endocrinology. (½ course each)

Prerequisites: courses 101, 102; Biological Chemistry 101A, 101B, and 101C or consent of the instructor. 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

211A-211B-211C. Basic Foundation in Endocrinology. (½ course each)

Prerequisites: Physiology 210A, 210B, 210C or consent of instructor. In depth seminar-lecture series on endocrinology. Physiology 211 is a continuation of the Physiology 210 series. Mr. Odell

212A-212B-212C. Critical Topics in Physiology. (¼ course each)

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.

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. Mr. Eisenberg

221. Graduate Commentary: Excitation and Contraction. (½ course)

Prerequisites: same as for course 101. For graduate students. An advanced supplementation of the topics being presented in course 101. Mr. Brady and Staff

222. Graduate Commentary: Energetics and Metabolism. (½ course)

Prerequisite: course 101. For graduate students. An advanced supplementation of the topics being presented in course 102. Mr. Brady, Mr. Homsher, Mr. Mommaerts

223. Graduate Commentary: Physiology of the Nervous System. (½ course)

Prerequisites: same as for course 101; consent of the instructor. For graduate students. An advanced

supplementation of the topics being presented in basic neurology. Ms. Buchwald

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. Hagiwara

225. Biological and Artificial Membranes. (½ course)

Prerequisites: consent of the instructor. Advanced lectures on the electrical properties of membranes of single cells and the molecular mechanisms for ion permeation in well-defined model membranes. Mr. Eisenman, Mr. Szabo

226. Bilayer Membranes.

Prerequisites: Consent of the instructor. Advanced lectures and laboratory demonstrating physical and chemical principles that underlie the behavior of lipid bilayer membranes, both artificial and natural. 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

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. The Staff

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 Doctoral Qualifying Examination or the Master's Comprehensive 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)

- Orson L. Anderson, Ph.D., *Professor of Geophysics.*
 Paul J. Coleman, Jr., Ph.D., *Professor of Planetary Physics.*
 Robert E. Holzer, Ph.D., *Professor of Geophysics.*
 William M. Kaula, M.S., *Professor of Geophysics.*
 Leon Knopoff, Ph.D., *Professor of Geophysics and Physics.*
 Richard E. Lingenfelter, B.S., *Professor of Geophysics in Residence.*
 Clarence E. Palmer, D.Sc., *Professor of Geophysics.*
 George W. Wetherill, Ph.D., *Professor of Geophysics and Geology (Chairman of the Department).*
 Friedrich H. Busse, Ph.D., *Associate Professor of Planetary Physics.*
 Gerald Schubert, Ph.D., *Associate Professor of Planetary Physics. (Vice-Chairman of the Department).*
 David D. Jackson, Ph.D., *Assistant Professor of Planetary Physics.*
 Hugh H. Kieffer, Ph.D., *Assistant Professor of Planetary Physics.*
 Robert L. McPherron, Ph.D., *Assistant Professor of Planetary Physics and Geophysics.*
 Durward D. Skiles, Ph.D., *Assistant Professor of Planetary Physics.*



Thomas A. Farley, Ph.D., *Lecturer in Planetary Physics.*



Ajit K. Mal, Ph.D., *Associate Professor of Engineering and Applied Science.*
 George L. Siscoe, Ph.D., *Associate Professor of Meteorology.*

Preparation for the Major

Chemistry 1A, 1B, 1C; Mathematics 11A, 11B, 11C and 12A, 12B, 12C; Physics 7A, 7B, 7C, 7D.

The Major

Physics 105A, 105B; 110A, 110B; 112A, 131A or Mathematics 145A; Planetary and Space Science M109, 120, M154. Three courses selected from Planetary and Space Science 101, M131, M134, M136, 265. Three electives selected from upper division courses with the approval of the adviser.

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 concentration. Appropriate fields of concentration are: the earth's interior, including gravity, tectonics, and seismology; geophysical fluid dynamics, including turbulence, rotating systems, and hydromagnetism; space physics, including the magnetosphere, solar wind, and cosmic rays; the moon and planets, including dynamics, surfaces, and atmospheres. The program for the individual student will be developed through consultation with the graduate adviser.

Requirements for the Degree of Master of Science

For general University requirements see pages 151-154.

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-200D 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. 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 151-154.

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 five fundamental physics courses: Physics 210A, Physics 215A, Physics 231A, 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-200D, (2) the comprehensive written examination of the Department of Planetary and Space Science, the written and oral field examination, on the student's major field of concentration.

Each student seeking a Ph.D. degree is required to fulfill the following University requirements. A qualifying oral examination. A dissertation on a subject chosen by the candidate with the approval of his doctoral committee. 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**

M109A. Geophysical Fluid Dynamics.

(Same as Meteorology M109A.) Lecture, 3 hours, discussion, 2 hours. **Prerequisites:** Mathematics 12C or 13C; Physics 7A, 7B, 7C, 7D. Together with Meteorology 109B, an introduction to fluid dynamics as applied to geophysical problems. Kinematics, Equations of fluid motion. Irrotational flow. Circulation theorems. Vorticity and vortices. Acoustic and gravity waves. Viscous flow. **Mr. Schubert**

120. Physics of the Earth.

Lecture, 3 hours; discussion, 1 hour. **Prerequisite:** Physics 7A, 7B, 7C, Mathematics 11A, 11B, 11C, or consent of instructor. Application of physics to the structure and evolution of the solid earth. Seismol-

ogy, convection and heat flow, gravity, geomagnetism, rock magnetism, and the relation of these topics to plate tectonics and other problems of current geophysical interest. **Mr. Skiles**

M131. Geochemistry.

(Same as Geology M131 and Geophysics M131.) Lecture, 3 hours, discussion, 1 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 Geology and Geophysics course M130.)

Mr. Kennedy, Mr. Wasson, Mr. Wetherill

M134. Mineral Physics and Equation of State.

(Same as Geology M134.) Lecture, 4 hours. **Prerequisite:** consent of instructor, upper division standing. Interrelationship of the physical properties of rock-forming minerals: optical reflectivity, refraction index, sound velocity, elastic constants, specific heat, and thermal expansivity. Determination of pressure, volume, and temperature relationships in planet-forming compounds. Variation of elastic constants with temperature and pressure. Application of shock-wave experiments to equations of state. **Mr. Anderson**

M136. Geophysical Exploration.

(Same as Geology M136 and Geophysics M136.) Lecture 3 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**

M154. The Earth's Plasma Environment.

(Same as Meteorology M154.) Lecture, 3 hours. **Prerequisites:** Physics 110B and either Physics 122 or course M109A, or consent of the instructor. Particle and electromagnetic emissions from the sun under quiet and under disturbed conditions. The solar wind. The magnetospheres and the ionospheres of the earth and other planets. Geomagnetic phenomena. Aurora and airglow. **Mr. Venkateswaran**

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: The Solid Earth.

Prerequisites: Physics 105A, 110A, 112A, 131 or consent of instructor. Geochemistry and petrology; geology; gravity field and rotational dynamics; seismology; heat transfer, thermal and mechanical evolution of the mantle; the core and geomagnetism. **Mr. Jackson, Mr. Schubert**

200B. Fundamentals of Planetary and Space Physics 2: the Earth's Ocean and Atmosphere.

Prerequisite: Physics 105A, 110A, 112A, 131 or consent of instructor. Chemistry of the ocean, atmosphere and upper atmosphere; non-circulating atmosphere; heat balance, evolution; fluid dynamics of

rotating and convective systems; circulation in the ocean and atmosphere; waves. Mr. Busse, Mr. Kieffer

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

200D. Fundamentals of Planetary and Space Physics 4: the Moon and Planets.

Prerequisites: Physics 105A, 110A, 112A, 131 or consent of the instructor. Dynamics of the solar system; meteorites and cosmochemistry; molecular spectra; observational techniques; current knowledge of the planets; origin of the solar system; origin and evolution of the earth's ocean and atmosphere.

Mr. Kaula, Mr. Kieffer

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. Kaula

202. Physics of Continuous Media.

Kinematics and dynamics of continuous media. Properties of stress, strain and rate of strain tensors. Conservation of mass, momentum, angular momentum and energy in integral and differential form. Applications of conservation principles to geophysical and astrophysical phenomena. Mr. Schubert

205. Geophysical Data Analysis.

Geophysical application of stochastic processes, time series analysis, spectral representation, filtering, linear regression, etc. Emphasis on problems of special geophysical interest, such as non-uniform distribution of data and inversion problems, including ill-posed linear and non-linear systems.

Mr. Jackson, Mr. Kaula

210. Hydrodynamic Instabilities and Turbulence.

An introduction to the theories of hydrodynamic instability and the non-statistical description of turbulence: stability bounds by the energy method; linear theory of instability; finite amplitude theories of post-instability flows; bounds on properties of turbulent flows by variational techniques. Mr. Busse

214. Geophysical Fluid Dynamics.

Prerequisite: Consent of the instructor. Dynamics of stationary and transient motions in rotating systems; Ekman boundary layer theory; inertial oscillations; β -plane approximation; Rossby waves; theory of thermally induced motions; applications to flow phenomena in planetary atmospheres, in the oceans, and in the earth's core. Mr. Busse

215. Magnetohydrodynamics.

The continuum theory of the interaction of conducting fluids and magnetic fields. Electrodynamics of moving media, boundary conditions, wave motion in bounded and unbounded media, energy flow, dynamo problem. Boundary layers and the effects of rotation. Geophysical and astrophysical applications. Mr. Skiles

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

M224A. Elastic Wave Propagation.

(Same as Engineering M258C.) 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

M224B. Elastic Wave Propagation.

(Same as Engineering M258D.) Prerequisite: course M224A. 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.

Magnetohydrostatic equilibria; 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 space-

craft; interaction of surface and atmosphere. Current observations and theories will be critically discussed. Mr. Kieffer

M250A-250B. Dynamics of the Solar Wind.

(Same as Meteorology M250A-250B.) Prerequisite: course 202 or consent of the instructor. Topics to include hydrodynamic solutions and magnetic field models, effects of the magnetic field and solar rotation, shock waves, discontinuities, small amplitude wave propagation, large scale structure, interaction with the moon, planets, and the interstellar medium, stellar winds, and stellar spindown.

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

266. Cosmic Ray Physics.

Cosmic ray composition, origin, acceleration, propagation, interactions with interstellar matter, magnetic field and radiation field, role in interstellar heating, non-thermal galactic radio and galactic x- and gamma-radiation, interactions in the earth's atmosphere.

Mr. Lingenfelter

262. 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. Busse, Mr. Skiles

M265. Seminar on the Origin of the Solar System.

(Same as Astronomy M265.) 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

267A-267B-267C. Seminar in Seismology.

Problems of current interest in seismology.

Mr. Knopoff

268A-268B-268C. Seminar on Current Problems in Space Physics.

Theoretical and experimental problems concerning particles and fields in space. Solar dynamical processes; the solar wind and its interactions with planetary bodies; the geomagnetic cavity; auroral and radiation belt particles and magnetospheric plasma; geomagnetic storms, sub-storms, and pulsations.

Mr. Coleman

269A-269B-269C. Seminar in Fluid Dynamics.

Research in fluid dynamics with emphasis on geophysical applications, including stability theory, turbulence, and magnetohydrodynamics. Mr. Busse

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); geochronology, lunar geology, and meteorites (Mr. Wetherill); climatology (Mr. Palmer); planetary surfaces and atmospheres (Mr. Kieffer); cosmic ray physics (Mr. Lingenfelter); seismology (Mr. Knopoff, Mr. Jackson); mineral physics (Mr. Anderson).

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-200D 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

Engineering 255A-255B. Advanced Dynamics.

258A-258B. Continuum Mechanics.

260A-260B. Celestial Mechanics.

Mathematics 272. Advanced Topics in Continuum Mechanics.

Physics 210A-210B. Electromagnetic Theory. 215A. Statistical Physics.

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.

Meteorology 240. Atmospheric Wave Phenomena.

246. Physics of the Ionosphere.

248. Dynamics of the Magnetosphere.

249. Plasma Phenomena in the Earth's Environment.

■ PLANT SCIENCE

See Department of Biology 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*.
 Roman Kolkowicz, Ph.D., *Professor of Political Science*.
 Andrzej Korboniski, 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 (Chairman)*.
 John C. Ries, Ph.D., *Professor of Political Science*.
 Harry M. Scoble, Ph.D., *Professor of Political Science*.
 David O. Sears, Ph.D., *Professor of Political Science and Psychology*.
 Foster H. Sherwood, Ph.D., LL.D., *Professor of Political Science*.
 Richard L. Sklar, 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*.
 H. Arthur Steiner, Ph.D., *Emeritus Professor of Political Science*.
 Richard E. Ashcraft, Ph.D., *Associate Professor of Political Science*.
 Richard D. Baum, Ph.D., *Associate Professor of Political Science*.
 David G. Farrelly, Ph.D., *Associate Professor of Political Science*.
 Robert C. Fried, Ph.D., *Associate Professor of Political Science*.
 Douglas S. Hobbs, Ph.D., *Associate Professor of Political Science*.
 Michael F. Lofchie, Ph.D., *Associate Professor of Political Science*.
 Francine Rabinovitz, Ph.D., *Associate Professor of Political Science*.
 David C. Rapoport, Ph.D., *Associate Professor of Political Science*.
 John R. Sisson, Ph.D., *Associate Professor of Political Science*.
 David O. Wilkinson, Ph.D., *Associate Professor of Political Science*.
 E. Victor Wolfenstein, Ph.D., *Associate Professor of Political Science*.
 Ciro Zoppo, Ph.D., *Associate 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*.

Carl P. Hensler, Ph.D., *Assistant Professor of Political Science.*
 Susan Kaufmann Purcell, Ph.D., *Assistant Professor of Political Science.*
 Karen J. Orren, Ph.D., *Assistant Professor of Political Science.*
 Simon H. Serfaty, 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.*



Leonard Freedman, Ph.D., *Lecturer in Political Science.*
 Paul J. Halpern, M.A., *Acting Assistant Professor of Political Science.*
 Marvin Hoffenberg, M.A., *Professor of Political Science in Residence.*

Preparation for the Major

Two lower division courses (8 units): Political Science 1; and Political Science 2, or 3, or 4.

The Major

Nine upper division political science courses (for a total of 36 units) numbered from 101 to 199 (101 is required). In addition, the student is required to complete 4 upper division courses (for a total of 16 units) in one or more of the following social sciences: Anthropology, Management (only 150, 180, 190A-190B), Economics, Geography, History, Psychology (except 115, 116, 117), Sociology. All of these classes (a minimum of 13) must be taken for a letter grade (not pass-fail).

Upper division courses are organized into six fields: (I) Political Theory, (II) International Relations, (III) Politics, (IV) Comparative Government, (V) Public Law, and (VI) Public Administration and Local Government.

Each political science major will be required to complete successfully Political Science 101, *Introduction to Political Theory*. Each major must also concentrate in one field by successfully completing at least three (3) upper division courses in that field. These courses count toward satisfaction of the requirement for nine upper division courses in the department. (See below for special field concentration requirements.) In addition the student must satisfy a distribution requirement by successfully completing at least one (1) course in each of three (3) other fields. Political Science 101 counts as one course in Political Theory (Field I) for either the concentration or the distribution requirement. Political Science 197 and 199 are not applicable to fulfillment of either the concentration or the distribution requirement. Only

one of the defense studies courses—138A, 138B, and 138C—may be counted toward field distribution requirements.

Specific requirements for *field concentration* are as follows: (I) *Political Theory*: Political Science 101 and any 2 additional courses in Field I; (II) *International Relations*: Political Science 2 and any 3 courses in Field II. Four units from 175A-175B may be counted as one of the three courses in Field II; (III) *Politics*: Any 3 courses in Field III. Political Science 182A may also be counted toward concentration in this field; (IV) *Comparative Government*: Political Science 168 and any 2 additional courses in Field IV. Political Science 115, 188A, or 188B—but not more than one of them—may also be counted toward concentration in this field; (V) *Public Law*: Political Science 170 or 171 and any 2 additional courses in Field V. Political Science 117 or 187—but not more than one of them—may also be counted toward concentration in this field; (VI) *Public Administration and Local Government*: Any 3 courses in Field VI. Political Science 138C, 173, or 174—but not more than one of them—may also be counted toward concentration in this field.

No course may be counted toward both concentration and distribution requirements.

Applicability of New Requirements. The above requirements shall be effective at the beginning of the Fall Quarter 1971 subject to the following modifications:

Any student who had achieved Junior standing by the beginning of the Fall Quarter 1971 is exempt from the new Preparation for the Major requirements.

Any student who had successfully completed what was formerly denoted as a "core course" in Political Theory is exempt from the Political Science 101 departmental requirement.

Political Science 150 (now deleted) will be

considered the equivalent of Political Science 168.

In addition to requirements for graduation prescribed by the College of Letters and Science, the student is expected to maintain a 2.0 grade-point average in all upper division political science.

The Honors Program. Students wishing to qualify for graduation with honors must have a 3.25 grade-point average in upper division political science; they must complete two honors proseminars, Political Science 197, and they must have an overall grade-point average of 3.0. See Political Science 197 for course prerequisites.

Several proseminars will be offered each quarter. Each proseminar will be devoted to a selected theme suitable for individual research and group discussion. 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 Undergraduate office before the last day of instruction of the preceding quarter.

Related Curricula. For the curricula in international relations and public service, see pages 78-79 and page 85 of 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

In addition to the requirements of the Graduate Division described on pages 31-33 of this announcement, the Department requires 2 letters of recommendation, GRE scores (both Aptitude and Advanced Government Tests) or Law School Aptitude scores. These materials are to be submitted by January 15 to the Graduate Adviser of the Political Science Department.

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; and Public Administration and Local Government.*

In addition to a series of introductory courses on problems of political inquiry (courses 203A-203C), the Department offers three types of graduate courses.

1. The 210 series of general courses.
2. The 220 through 240 series of specialized courses.

3. The 250 through 270 series of seminars which are ordinarily 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.

M.A. as well as Ph.D. students are expected to carry a full-time program which consists of a minimum of two full courses per quarter.

The M.A. Program

The Department operates under the Comprehensive Examination Plan (a one-field examination and overall evaluation), although the Thesis Plan may be pursued in special cases with the approval of the Graduate Studies Committee.

Course Requirements. Nine quarter courses taken while the student is in graduate status, five (5) of which must be graduate courses, distributed among three (3) fields of study offered in the Department of Political Science. Courses 203A and 203B together may be substituted for one of three fields. The 596 course will not normally apply to this five course requirement. It should be noted that the 597 course can *never* be used to meet this requirement—this course is designed only for independent study and is not given unit or course credit for a degree. The remaining four courses may be chosen by the student at his discretion, in or out of the Political Science Department. None of these courses may be lower division courses.

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 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.

Language Requirement. There is no language requirement for the M.A. degree.

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 by the end of the fourth quarter after entering the graduate 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 confidential faculty reports. The examining committee may in addition give the student an oral examination. The examining committee then makes one of the following determinations: (1) That the student receive the M.A. degree (when all departmental and University requirements are met) and be permitted 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. degree in Political Science or the equivalent is a prerequisite for admission to the Ph.D. program. A student entering with an M.A. degree from another university or another UC campus must first pass the M.A. screening examinations in this department by the end of the fourth quarter after entering the graduate program before being admitted to the Ph.D. program.

Course Requirements: A minimum of fourteen (14) courses, including three (3) seminars distributed among three of the six departmental fields prior to taking the Ph.D. Evaluation Sequence. A minimum of nine of the fourteen courses must be taken in the Department of Political Science, no more than five of which may be in the 500 series and upper division level. None of these four-

teen courses may be lower division courses. A maximum of two 500 series courses may be taken with the same professor. The nine courses taken in the M.A. are included in the Ph.D. course requirement. Furthermore, a student admitted to the Department with graduate work completed elsewhere may petition the Graduate Studies Committee for permission to apply credits to this requirement. A student must take a minimum of three courses (including two graduate courses) in a field other than his or her three major fields. This constitutes the "write-off" field, and may be within or without the Department (see Outside Field below), and must be approved by the Graduate Studies Committee. Only one field in the student's program may be outside the Department.

In addition to the course requirements, all graduate students in the Department are required to have formal teaching experience in an institution of higher learning. Waiver of this requirement is possible in exceptional circumstances upon petition to the Graduate Studies Committee. Serving as a Teaching Assistant in the Political Science Department satisfies this teaching requirement.

Outside Field. For one field, the student may request a substitution of a field outside the Department. This may be either an examination field or the "write-off" field. The student, the student's adviser, and the instructor under whom the student wishes to do his work outside the Department, will draft a written proposal for this field which must state the substantive material to be covered, the course program, and how the outside field fits into the student's overall program and intellectual interests. 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. Three quarters in advance of the student's taking the Ph.D. Evaluation Sequence, the proposal must be approved by the student's adviser, the outside instructor, and the Graduate Studies Committee.

Research Tool Requirement. Graduate students must fulfill one of the following research tool requirements: (1) a demonstration of advanced proficiency in one foreign language suitable for field research. This level and the manner of examination is determined for each language by the Depart-

ment of Political Science. Ordinarily advanced proficiency is demonstrated by passing the GSFLT examination with a minimum score of 850. Where judged by the student's adviser as necessary for the successful conduct of research, the student choosing this option shall be required to demonstrate proficiency in that language through an oral examination conducted by an appropriate member of the faculty. (2) A demonstration of advanced proficiency in research methodology. Detailed regulations regarding this option are available in the Political Science Graduate Office.

The student's choice of a Research Tool must be approved by the adviser. Students in the Ph.D. program are expected to complete this requirement prior to taking the Ph.D. Evaluation Sequence.

Ph.D. Evaluation Sequence. Within three years after admission to the Department, a student will be evaluated during one quarter in the student's three major fields as follows: (a) In one field other than that in which the student took the M.A. screening examination the student will take a written examination; (b) for a second field the student will submit a chapter of a dissertation or a paper of superior quality; (c) in a third field the student will define a broad segment of the field, and prepare a bibliographic essay or a course syllabus and an annotated bibliography which becomes the basis of a structured oral examination in the field. The faculty committee responsible for the evaluation process in each field shall formulate procedures for the administration of each of the forms of evaluation in that field. This Evaluation Sequence is administered twice a year (near the end of the fall quarter, and near the end of the spring quarter).

If the student passes all three fields, the student will be allowed to proceed to the University oral qualifying examination. A delay of up to six months in taking the University oral examination may be required by the Department Review Committee. If a student fails in one field, the student shall be reevaluated at the next regularly scheduled examination period. If the student fails in more than one field, the student may be terminated by the Department Review Committee. If not terminated, the student will be reevaluated at the next regularly scheduled examination period. Further details regarding the Department Review Committee are available in the Political Science Graduate Office.

If a student fails the second evaluation, the student is terminated as a graduate student in the Department.

Doctoral Committee. Upon satisfactory completion of the Ph.D. Evaluation Sequence, course work, and research tool requirements, the student proceeds to the University oral qualifying examination to determine whether or not the student should be advanced to candidacy.

Upon being advanced to candidacy, the student will be eligible for 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 proposal for the dissertation. The dissertation must be approved within seven years after being advanced to candidacy.

Master of Public Administration

The program leading to the degree of Master of Public Administration is designed both for those who have recently earned a bachelor's degree and wish to prepare for a career in governmental administration, and for public servants who wish to 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. Specific inquiries regarding this program should be addressed to: Director, Master of Public Administration Program, Mathematical Sciences 8308.

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. The applications will be reviewed by the Graduate Admissions 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.)

University Requirements: See pages 148-149 of this bulletin.

Admission to the Program. (a) The student must have received the degree of Bachelor of Arts with undergraduate training or work experience which the Master of Public Administration admissions committee regards as satisfactory preparation. (b) In addition to the application for admission to graduate status to be filed with the Graduate Division, an M.P.A. application must be submitted to the Director of the M.P.A. Program.

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. All programs must be approved by the Director of the M.P.A. Program.

Comprehensive Examinations. 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 Specialty. (One option to be chosen; listing is illustrative.) 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; transportation.

Written examinations are conducted in each of the three fields of study. An oral examination follows completion of the written examinations. The oral examination committee determines whether a student has passed or failed the examination sequence. A student who fails the sequence shall be permitted to retake the examination(s), but only once, and at the next regularly scheduled examination period.

Internship. In addition to the 36 units (nine courses) of course credit, 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. This course is required of all students concentrating in Field II and may be used to fulfill one of the two requirements for the Preparation for the Major. The Staff

3. Introduction to Comparative Government.

Lecture, three hours; discussion, one hour. Prerequisite: Political Science 1. A comparative study of constitutional principles, governmental institutions, and political processes in selected contemporary states, with emphasis on the major European governments. This course may be used to fulfill one of the two course requirements for the Preparation for the Major. The Staff

4A-4Z. Current Problems in Political Science.

Prerequisite: Successful completion of or concurrent enrollment in Political Science 1 and consent of the instructor. Proseminars will be offered each quarter dealing with selected political problems. Topics will be announced during the preceding quarter. Enrollment will be limited. Preference will be given to declared freshman majors. This course may be used to fulfill one of the two course requirements for the Preparation for the Major. The Staff

Upper Division Courses

Prerequisite for all upper division courses: upper division standing or consent of instructor.

GROUP 1. POLITICAL THEORY

101. Introduction to Political Theory.

Lecture, three hours; discussion, one hour. An exposition and analysis of selected political theorists and concepts from Plato to the present. This course is required of all majors. The Staff

110. Early Modern Political Theory.

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.

Lecture, three hours; discussion, one hour. 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 101 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. This course may be counted in either Field I or IV.

Mr. Lofchie, Mr. Nixon

117. Jurisprudence.

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. This course may be counted in either Field I or V.

Mr. Gerstein, Mr. Sherwood

119A-119Z. Special Studies in Political Theory.

Prerequisites: Political Science 101, one additional course in Field I, and consent of the instructor. Intensive examination of one or more special problems appropriate to political theory. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

GROUP II. INTERNATIONAL RELATIONS

120. Foreign Relations of the United States.

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. Serfaty

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

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. Kolkowicz, Mr. Korbonaki

129. Regional International Politics.

Lecture, three hours; discussion, one hour. 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. Baum, Mr. Wilson

131. Latin American International Relations.

The major problems of Latin-American international relations and organization in recent decades.

Mr. Gonzalez, Mrs. Parcell

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

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

137. International Relations Theory.

Prerequisites: 2 courses in Field II, or Political Science 2 and 1 course in Field II. An analysis of contemporary theories of international relations. One or more theorists representative of the leading approaches to the study of international relations will be selected for study. This course is primarily for students concentrating in international relations who intend to go to graduate school in political science.

Mr. Wilkinson, Mr. Zoppo

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.

A study of the institutional and policy framework in the national military field. This course may be counted in either Field II or VI.

Mr. Ries

139A-139Z. Special Studies in International Relations.

Prerequisites: Two courses in Field II, or Political Science 2 and one course in Field II, and consent of the instructor. Intensive examination of one or more special problems appropriate to international relations. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

See also course 175A-175B.

GROUP III. POLITICS**141. Public Opinion and Propaganda.**

Lecture, three hours; discussion, one hour. 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. 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.

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.

Prerequisite: course 141. 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

147. Minority Group Politics.

Lecture, three hours; discussion, one hour. Prerequisites: Political Science 1, plus one of the following: one additional 140-level course; or one upper-division course on race or ethnicity from History, Psychology, or Sociology; or consent of the instructor.

A systematic evaluation of the functioning of the American polity, related to problems of race and ethnicity. Topics include: leadership, organization, ideology, conventional versus unconventional political behavior, inter-minority relations, co-optation, symbolism, and repression.

Mr. Scoble

149A-149Z. Special Studies in Politics.

Prerequisites: Two courses in Field III and consent of the instructor. Intensive examination of one or more special problems appropriate to politics. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

See also course 182A.

GROUP IV. COMPARATIVE GOVERNMENT**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. Korbonski

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, Mr. Kolkowicz

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. Kolkowicz, Mr. Korbonski

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

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 and political processes and problems of states in Southeast Asia (Burma, Thailand, Malaya, Laos, Cambodia, Vietnam, Indonesia, and the Philippines).

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

163A. Government and Politics in Latin America.

(Formerly numbered 168A.) A comparative study of governmental and political development, organization and practices in the states of Middle America.

Mr. Gonzalez, Mrs. Purcell

163B. Government and Politics in Latin America.

(Formerly numbered 168B.) A comparative study of governmental and political development, organization and practices in the states of South America.

Mr. Gonzalez, Mrs. Purcell

164. Government and Politics in the Middle East.

A comparative study of government in the Arab States, Turkey, Israel and Iran.

Mr. Kerr

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-166B-166C. Government and Politics in**Sub-Saharan Africa.**

166A. Western Africa.

166B. Eastern Africa.

166C. 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 three 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 non-industrial societies are examined in light of the current debate about imperialism. Mr. Sklar

168. Comparative Political Analysis.

Prerequisites: Two courses in Field IV, or Political Science 3 and one course in Field IV. Major approaches to the study of comparative politics. Concepts and methodology of comparative analysis. Required of all students concentrating in Field IV.

The Staff

169A-169Z. Special Studies in Comparative Government.

Prerequisites: Two courses in Field IV, or Political Science 3 and one course in Field IV, and consent of the instructor. Intensive examination of one or more special problems appropriate to comparative government. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

See also Courses 115, 188A, 188B.

GROUP V. PUBLIC LAW**170. The Anglo-American Legal System.**

Lecture, four hours; discussion, one hour. 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. Either this course or Political Science 171 is required of all students concentrating in Field V. Mr. Gerstein

171. The Supreme Court.

Lecture, four hours; discussion, one hour. 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. Either this course or Political Science 170 is required of all students concentrating in Field V. Mr. Gerstein, 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.

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. This course may be counted in either Field V or VI.

Mr. Bernstein, Miss Orren

174. Government and Labor.

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. This course may be counted in either Field V or VI. Mr. Bernstein

175A-175B. International Law.

A study of the nature and place of international law in the conduct of international relations. 175A and 175B may be offered in consecutive terms or simultaneously. If offered consecutively, 175A is prerequisite to 175B, and a student may take 175A alone for four units credit. If they are offered simultaneously, a student must take both courses for 8 units. A maximum of 4 units (1 course) may be counted in Field II.

Mr. Sherwood

179A-179Z. Special Studies in Public Law.

Prerequisites: Political Science 170 or 171, one additional course in Field V, any special requirements, and consent of the instructor. Intensive examination of one or more special problems appropriate to public law. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

See also Courses 117, and 187.

GROUP VI. PUBLIC ADMINISTRATION AND LOCAL GOVERNMENT**180. State and Local Government.**

A study of state political systems, including their administrative and local sub-systems; intergovernmental relationships; and their policy outputs, with specific attention being given to California.

Mr. Crouch

181. The Politics of Federal Bureaucracy.

Analysis of the causes and consequences of the emergence of the federal bureaucracy as a major actor in national policy-making and implementation. Emphasis will be placed on questions of power, performance, and responsiveness.

Mr. Fried, Mrs. Rabinovitz

182A. Metropolitan Area Government and Politics.

An overview of the political and social organization, decision-making processes, policy problems, and conflicts of metropolitan areas and their central cities and suburbs. Attention is also given to the impact on these areas of the national and state political systems and racial, ethnic, and protest movements. This course may be counted in either Field III or VI.

Mr. Bolles, Mrs. Rabinovitz

182B. City Government and Politics.

Prerequisite: Political Science 182A or consent of the instructor. Intensive analysis of contemporary urban governance in the United States. Emphasis is given to such student participatory activities as field-work, research, and gaming of urban politics and policy problems.

Mr. Bollens, 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

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.

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. This course may be counted in either Field IV or VI.

Mr. Sherwood

188A. Comparative Public Administration.

An analysis of bureaucratic structures and function 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. This course may be counted in either Field IV or VI.

Mr. Fried

188B. Comparative Urban Government.

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. This course may be counted in either Field IV or VI.

Mr. Fried, Mrs. Rabinovitz

189A-189Z. Special Studies in Public Administration

Prerequisites: Two courses in Field VI and consent of the instructor. Intensive examination of one or more special problems appropriate to public administration. Sections will be offered on a regular basis with topics announced in the preceding quarter. Courses 119, 139, 149, 169, 179 and 189 may be applied no more than twice toward the field concentration requirement. No more than three of these courses may be applied toward the major.

The Staff

190. Theories of Organization.

Prerequisite: courses 181 or 186. An examination of the theoretical frameworks for studying public and

private bureaucracies, with emphasis upon ideologies, values, behavioral patterns, and concepts of organization.

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

See also Courses 138C, 173, and 174.

UNGROUPED**197A-197Z. Undergraduate Honors Proseminars.**

Prerequisite: At least four upper division courses in political science with a grade-point average of 3.25, and an over-all 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)

Prerequisites: upper division standing, consent of the instructor and approval by the Chairman of the Department. May be repeated for a total of four full courses. Individual study. See additional information in statement of requirements for the major in political science.

The Staff

Graduate Courses**GENERAL****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

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**

SUBSTANTIVE COURSES**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**

224A-224K. 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.

A critical evaluation of the literature concerned with the backgrounds of public men, and with the screening and sponsoring mechanisms affecting their careers and political perspectives.

Mr. Marvick, Mr. Snowiss

224C. Politics and Society.

The application of selected classical and contemporary sociological theories to politics.

Mr. Halpern, Mr. Scoble

224D. Group Theories of Politics.

Critical appraisal of "group theory" approaches to the study of political decision-making, with special attention to empirical research problems and findings.

Miss Orren, 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. Marvick, Mr. Snowiss

224F. Executive Politics and the Presidency.

An analysis of executive organization and leadership with emphasis on the American presidency. Special attention to theories of organization and personality and the relationship between the executive and other institutions and groups.

Mr. Halpern, Mr. Snowiss

M224G. Political Psychology.

(Same as Psychology M228.) A survey of psychological approaches to political analysis; topics include personality, small group analysis, experimental social-psychology, and cognitive psychology.

Mr. Hensler, Mr. Sears

M224H. Comparative Community Political Systems.

(Same as Architecture and Urban Planning M214.)

Critical evaluation of the literature on community power and secondary analysis of data from extant research. Special attention to power distributions, leadership recruitment, and public and private decision making.

Mrs. Rabinovitz, Mr. Scoble

224I. Political Parties.

A critical examination of the literature on party systems and organization. Special attention will be given to political functions, electoral campaigns, and party cadres.

Mr. Marvick

224J. Mass Political Attitudes and Behavior.

An analysis of the development and change of political attitudes in mass publics, and their relationship to voting, protest, and violence.

Mr. Hensler, Mr. Marvick, Mr. Sears

224K. Polity and Economy.

An analysis of the theoretical and practical relationships between economic organization and governmental institutions. Study will include the development and political implications of the market system, banking and finance, corporate enterprise, and organized labor.

Mr. Halpern, Miss Orren

225. Studies in Comparative Politics.**225A. Political Culture and Socialization.**

The interrelationships between culture and political forms, the processes by which citizens acquire political values and beliefs, and the norms which regulate the ways in which beliefs are expressed in political behavior.

The Staff

225B. Authority Systems.

A comparative analysis of the principles and organizational forms of political authority. Topics include constitutionalism, federalism, corporatism, totalitarianism and mass society.

The Staff

225C. Leadership and Elite Recruitment.

A comparative analysis of the modes and bases of political elite recruitment and the nature of leadership with attention to various elite theories and analytical frameworks.

The Staff

225D. Comparative Political Participation.

Patterns and effects of public involvement in the political process. Topics include the comparative analysis of political parties, groups, movements, and electoral behavior.

The Staff

225E. Political Development.

An analysis of the major contemporary schools of development theory, emphasizing interrelationships among political, social, and economic variables.

The Staff

225F. Comparative Administrative Systems.

An examination of variations in the organization style, and performance of administrative systems, including central and subnational governmental bureaucracies. Emphasis on the interdependence of administrative behavior and political, cultural, and economic variables.

The Staff

225G. Comparative Policy and Governmental Performance.

This course focuses on policy outputs and the impact of governmental performance in countries at various stages of social and economic development. It attempts to assess the significance of governmental as compared to social, economic, and cultural factors in shaping the scope of politics.

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

M228C. Political and Administrative Aspects of Planning.

(Same as Architecture and Urban Planning M205.) A study of the political constraints on and support for effective planning. To be explored are the relationships between planning performance and government structure, political culture, and the scope of planning goals.

Mr. Engelbert, Mr. Fried

228D. The National Administrative System.

An examination of the formulation and implementation of policy at the federal level. The consequences of administrative performance for American political and social life will be explored.

The Staff

228E. State Administrative Systems.

An analysis of state administrative systems, their local sub-systems, and their outputs.

Mr. Crouch

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

231A-231E. 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.

The Staff

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. Wilkinson

231E. Theories of Regional International Relations.

An examination of varying approaches to the study of regional international relations.

Mr. Cantori, Mr. Spiegel

235. Selected Topics in Comparative Politics.

(Formerly numbered 225.) A critical examination of a major problem in comparative politics. The Staff

238A-238D. 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

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. 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.

250A-250L. Seminars in Regional and Area Political Studies.

250A. Latin-American Studies. Mr. Gonzalez

250B. Russian and Slavic Studies.

Mr. Cattell, Mr. Kolkowicz, Mr. Korbonaki

250C. Chinese and East Asian Studies. Mr. Baum

250D. Japanese and Western Pacific Studies.

Mr. Baerwald

250E. African Studies. Mr. Lofchie, 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

256. Seminar in Comparative Government.

The Staff

257. Seminar in Political Theory.

The Staff

259. Seminar in Political and Electoral Problems.

Prerequisite: two graduate courses in Politics.

The Staff

262. Seminar in Municipal Government. 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.

The Staff

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.*

Walter R. Goldschmidt, Ph.D., *Professor of Psychiatry and Anthropology.*

Frank M. Hewett, Ph.D., *Professor of Education and Medical Psychology.*

Harry J. Jerison, Ph.D., *Professor of Medical Psychology in Residence.*

Donald B. Lindsley, Ph.D., *Professor of Psychiatry, Psychology and Physiology.*

James T. Marsh, Ph.D., *Professor of Medical Psychology.*

Philip R. A. May, M.D., *Professor of Psychiatry in Residence.*

John H. Menkes, M.D., *Adjunct Professor of Psychiatry, Pediatrics and Neurology.*

Ivan N. Mensh, Ph.D., *Professor of Medical Psychology.*

George J. Popjak, M.D., *Professor of Psychiatry and Biological Chemistry.*

Douglas R. Price-Williams, Ph.D., *Professor of Anthropology in Residence.*

Eugene Pumpian-Mindlin, M.D., *Professor of Psychiatry.*

Arnold B. Scheibel, M.D., *Professor of Psychiatry and Anatomy.*

Edwin S. Shneidman, Ph.D., *Professor of Medical Psychology in Residence.*

Robert J. Stoller, M.D., *Professor of Psychiatry.*

George Tarjan, M.D., *Professor of Psychiatry and Public Health.*

Bernice M. Wenzel, Ph.D., *Professor of Psychiatry and Physiology.*

L. J. West, M.D., *Professor of Psychiatry (Chairman of the Department).*

Frank F. Tallman, M.D., *Emeritus Professor of Psychiatry.*

Charles W. Tidd, M.D., *Emeritus Professor of Psychiatry.*

Pietro Castelnuovo-Tedesco, M.D., *Associate Professor of Psychiatry in Residence.*

Robert B. Edgerton, Ph.D., *Associate Professor of Anthropology in Residence.*

Bernice T. Eiduson, Ph.D., *Adjunct Associate Professor of Psychiatry.*

Samuel Eiduson, Ph.D., *Associate Professor of Biological Chemistry in Residence.*

Edward Geller, Ph.D., *Adjunct Associate Professor of Psychiatry.*

- Joshua S. Golden, M.D., *Associate Professor of Psychiatry in Residence.*
 Richard Green, M.D., *Associate Professor of Psychiatry in Residence.*
 Chester D. Hull, Ph.D., *Associate Professor of Medical Psychology in Residence.*
 John G. Kennedy, Ph.D., *Associate Professor of Anthropology in Residence.*
 Henry Lesse, M.D., *Associate Professor of Psychiatry in Residence.*
 Michael T. McGuire, M.D., *Associate Professor of Psychiatry in Residence.*
 Edward M. Ornitz, M.D., *Associate Professor of Psychiatry in Residence.*
 Morris J. Paulson, Ph.D., *Associate Professor of Medical Psychology in Residence.*
 Michel Philippart, M.D., *Associate Professor of Pediatrics in Residence.*
 Edward R. Ritvo, M.D., *Associate Professor of Psychiatry in Residence.*
 Alexander C. Rosen, Ph.D., *Associate Professor of Medical Psychology and Psychology in Residence.*
 Richard J. Schain, M.D., *Associate Professor of Pediatrics in Residence.*
 Donald A. Schwartz, M.D., *Associate Professor of Psychiatry.*
 Donald E. Spiegel, Ph.D., *Adjunct Associate Professor of Medical Psychology.*
 J. Thomas Ungerleider, M.D., *Associate Professor of Psychiatry in Residence.*
 Charles D. Woody, M.D., *Associate Professor of Psychiatry, Anatomy and Physiology in Residence.*
 Arthur Yuwiler, Ph.D., *Adjunct Associate Professor of Psychiatry.*
 Frederick D. Abraham, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Linda J. Beckman, Ph.D., *Adjunct Assistant Professor of Psychology.*
 Stephen Bernstein, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 John P. Blass, Ph.D., M.D., *Assistant Professor of Psychiatry and Biological Chemistry.*
 Robert J. Bonkowski, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Mary A. Campbell, Ph.D., *Assistant Professor of Psychiatry and Biomathematics in Residence.*
 Stephen D. Cederbaum, M.D., *Assistant Professor of Psychiatry in Residence.*
 Barbara F. Crandall, M.D., *Assistant Professor of Psychiatry in Residence.*
 Louise D. Epps, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Charles V. Ford, M.D., *Assistant Professor of Psychiatry in Residence.*
 Ira M. Frank, M.D., *Assistant Professor of Psychiatry in Residence.*
 Richard Friedman, M.D., *Assistant Professor of Psychiatry in Residence.*
 Irene T. Goldenberg, Ed.D., *Assistant Professor of Medical Psychology in Residence.*
 Frederick Gottlieb, M.D., *Assistant Professor of Psychiatry in Residence.*
 Nancy B. Graves, Ph.D., *Assistant Professor of Sociology in Residence.*
 Bijan M. Guilani, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 John Hanley, M.D., *Assistant Professor of Psychiatry in Residence.*
 Jean C. Holroyd, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Isabelle F. Hunt, D.P.H., *Assistant Professor of Nutrition in Residence.*
 Julian Kivowitz, M.D., *Assistant Professor of Psychiatry 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.*
 Lionel B. Levin, M.D., *Adjunct Assistant Professor of Psychiatry.*
 Lionel Levison, M.D., *Adjunct Assistant Professor of Psychiatry.*
 Edward H. Liston, M.D., *Assistant Professor of Psychiatry in Residence.*
 Gayle G. Marsh, Ph.D., *Adjunct Assistant Professor of Medical Psychology.*
 Charles P. McCreary, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 William H. Miller, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Clinton Y. Montgomery, M.D., *Assistant Professor of Psychiatry in Residence.*
 Gene R. Moss, M.D., *Adjunct Assistant Professor of Psychiatry.*
 Thelma S. Moss, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Kazuo Nihira, Ph.D., *Assistant Professor of Psychology and Medical Psychology in Residence.*

Robert O. Pasnau, M.D., *Assistant Professor of Psychiatry in Residence.*
 Michael I. Paul, M.D., *Assistant Professor of Psychiatry in Residence.*
 Donald F. Piper, M.D., *Assistant Professor of Psychiatry and Pediatrics in Residence.*
 Beatrice Rasof, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Diane M. Reardon, Ph.D., *Adjunct Assistant Professor of Medical Psychology.*
 Carol S. Ricci, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Kiki V. Roe, Ph.D., *Adjunct Assistant Professor of Medical Psychology.*
 Paul F. Slawson, M.D., *Assistant Professor of Psychiatry in Residence.*
 Serena Stier, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Charles B. Stone, M.D., *Assistant Professor of Psychiatry in Residence.*
 John M. Suarez, M.D., *Assistant Professor of Psychiatry in Residence.*
 Peter E. Tanguay, M.D., *Assistant Professor of Psychiatry in Residence.*
 James W. Teague, M.D., *Assistant Professor of Psychiatry in Residence.*
 Kenneth C. Troutman, D.D.S., *Assistant Professor of Dentistry in Residence.*
 Alexander J. Tymchuk, Ph.D., *Assistant Professor of Medical Psychology in Residence.*
 Mario Valente, M.D., *Assistant Professor of Psychiatry in Residence.*
 Theodore Van Putten, M.D., *Assistant Professor of Psychiatry in Residence.*
 Leila Beckwith, Ph.D., *Adjunct Instructor in Psychiatry.*
 Elliot M. Brenner, Ph.D., *Instructor in Medical Psychology in Residence.*
 R. Wyman Sanders, M.D., *Instructor in Psychiatry in Residence.*
 Douglas R. Schiebel, Ph.D., *Instructor in Medical Psychology in Residence.*



Mary J. Amundson, M.D., *Acting Assistant Professor of Nursing.*
 William C. Beckwith, Ph.D., *Assistant Clinical Professor of Medical Psychology.*
 Philip E. Blake, M.A., *Acting Assistant Professor of Psychology.*
 Darrell W. Bolen, M.D., *Assistant Clinical Professor of Psychiatry.*
 Stewart M. Bramson, M.D., *Clinical Instructor in Psychiatry.*
 Marvin D. Brown, M.S.W., *Lecturer in Social Work.*
 Alexander B. Caldwell, Ph.D., *Assistant Clinical Professor of Medical Psychology.*
 Maury T. Carlin, Ph.D., *Clinical Instructor in Medical Psychology.*
 Ronald H. Cooper, J.D., *Lecturer in Legal Psychiatry.*
 Georgia A. Dooley, M.S.W., *Associate in Social Work.*
 Herbert H. Eveloff, M.D., *Assistant Clinical Professor of Psychiatry.*
 Don E. Flinn, M.D., *Associate Clinical Professor of Psychiatry.*
 Steven R. Forness, Ph.D., *Demonstration Teacher.*
 Florence Frisch, M.S.W., *Associate in Social Work.*
 Charlotte B. Gelb, M.S.W., *Associate in Social Work.*
 Ronald J. Griffith, M.D., *Assistant Clinical Professor of Psychiatry.*
 Betty L. Harker, M.S.W., *Lecturer in Social Work.*
 Sheldon H. Kardener, M.D., *Assistant Clinical Professor of Psychiatry.*
 Charles V. Keeran, M.S.W., *Lecturer in Mental Hospital Administration.*
 William C. Keirn, M.S.W., *Associate in Social Work.*
 Norma E. Lappen, M.S.W., *Associate in Social Work.*
 Perry C. Lessin, M.S.W., *Associate in Social Work.*
 Jaclyn Miller, M.S.W., *Associate in Social Work.*
 Armando Morales, M.S.W., *Acting Assistant Professor of Social Work.*
 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 Psychology.*
 Marion Pastor, M.S.W., *Associate in Social Work.*
 Irene Paulson, M.S.W., *Associate in Social Work.*
 Stephanie L. Pearlstein, M.S.W., *Associate in Social Work.*

Frederick R. Penrose, M.S.W., *Associate in Social Work.*
 Rita R. Rogers, M.D., *Associate Clinical Professor of Psychiatry.*
 Mitchell S. Rosenthal, M.D., *Lecturer in Psychiatry.*
 Barbara R. Salkin, M.S.W., *Associate in Social Work.*
 Eustace A. Serafetinides, M.D., Ph.D., *Visiting Associate Professor of Psychiatry.*
 James Q. Simmons, M.D., *Associate Clinical Professor of Psychiatry.*
 Jerald I. Simon, M.D., *Assistant Clinical Professor of Psychiatry.*
 Roland C. Summit, M.D., *Lecturer in Psychiatry.*
 Jivan R. Tabibian, M.A., *Lecturer in Psychiatry.*
 Sherry Terzian, M.S., *Librarian.*
 Thomas S. Weisner, Ph.D., *Acting Assistant Professor of Anthropology.*
 Joyce Will, M.S.W., *Associate in Social Work.*
 Bruce H. Woolley, M.S., *Lecturer in Hospital Administration.*

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 141 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 14 courses in the graduate or upper division level and a thesis are required. No less than 7% of the 14 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, Psychology, Public Health or Sociology is required), subject to approval by the graduate adviser.

Comprehensive Examination Plan. A minimum of 15% courses of graduate and upper division level are required, of which at least 7% 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, Psychology, Public Health 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 Courses

M105. The Social Sciences in Psychiatry.

(Same as Anthropology M101.) Prerequisite: consent of the instructor. An introduction to the fields of social psychology, sociology, cultural anthropology, and ethology. Mr. Kennedy

199. Special Studies in Psychiatry. (½ to 1 course)

Prerequisite: consent of the instructor. The Staff

Graduate Course

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 and Community 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. The Staff

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. The Staff

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 456A is prerequisite for course 456B. Review of major theories of consultation and presentation of techniques for dealing with common problems of consultant-client interactions.

Mr. Gabor

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 each)

(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. Wallace

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. Egge

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. Cannon, Mr. Newman

Individual Study and Research

596. Special Studies in Social Psychiatry.

(1½ courses)

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.

Mr. Kennedy

|| To be offered Winter Quarter, 1972.

■ 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 Engineering and Applied Science and Professor of Psychology.*
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.*
Joseph A. Gengerelli, Ph.D., *Professor of Psychology.*
Harold B. Gerard, Ph.D., *Professor of Psychology.*
Michael J. Goldstein, Ph.D., *Professor of Psychology.*
Wendell E. Jeffrey, Ph.D., *Professor of Psychology.*
Harry Jerison, Ph.D., *Professor of Medical Psychology and Psychology in Residence.*
F. Nowell Jones, Ph.D., *Professor of Psychology.*
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, Psychiatry 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 (Chairman of the Department).*
William H. McGlothlin, Ph.D., *Professor of Psychology in Residence.*
Charles Y. Nakamura, Ph.D., *Professor of Psychology (Vice Chairman of Graduate Affairs).*
Allen Parducci, Ph.D., *Professor of Psychology.*
Bertram H. Raven, Ph.D., *Professor of Psychology.*
Eliot H. Rodnick, Ph.D., *Professor of Psychology.*
David O. Sears, Ph.D., *Professor of Psychology and Political Science.*
John P. Seward, Ph.D., *Professor of Psychology.*
Joseph G. Sheehan, Ph.D., *Professor of Psychology.*
Edwin S. Shneidman, Ph.D., *Professor of Medical Psychology and Sociology.*
Gerald H. Shure, Ph.D., *Professor of Psychology and Sociology.*
Marion A. Wenger, Ph.D., *Professor of Psychology.*
S. Carolyn Fisher, Ph.D., *Emeritus Professor of Psychology.*
Milton E. Hahn, Ph.D., *Emeritus Professor of Psychology.*
Laurence A. Petran, Ph.D., F.A.G.O., *Emeritus Professor of Music and Psychology.*
Richard P. Barthol, Ph.D., *Associate Professor of Psychology.*
Peter M. Bentler, Ph.D., *Associate Professor of Psychology.*
Barry E. Collins, Ph.D., *Associate Professor of Psychology.*
Kent Dallett, Ph.D., *Associate Professor of Psychology.*
Gaylord D. Ellison, Ph.D., *Associate Professor of Psychology.*
Morton P. Friedman, Ph.D., *Associate Professor of Psychology (Acting Chairman).*
John P. Houston, Ph.D., *Associate Professor of Psychology.*
Richard A. Kalish, Ph.D., *Adjunct Associate Professor of Public Health and Psychology.*
Franklin B. Krasne, Ph.D., *Associate Professor of Psychology.*
John C. Liebeskind, Ph.D., *Associate Professor of Psychology.*
Millard C. Madsen, Ph.D., *Associate Professor of Psychology.*
Albert Mehrabian, 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.*
 Alexander C. Rosen, Ph.D., *Associate Professor of Medical Psychology and Psychology in Residence.*
 James P. Thomas, Ph.D., *Associate Professor of Psychology.*
 Bernard Weiner, Ph.D., *Associate Professor of Psychology.*
 Jackson Beatty, 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.*
 Terry T. Faw, Ph.D., *Assistant Professor of Psychology.*
 Gilbert Freitag, Ph.D., *Assistant Professor of Psychology.*
 Gerald M. Goodman, 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.*
 Eugene B. Johnson, Ph.D., *Assistant Research Psychologist and Adjunct Assistant Professor of Psychology.*
 David E. Kanouse, Ph.D., *Assistant Professor of Psychology.*
 Adam T. Kohler, Ph.D., *Adjunct Assistant Professor of Psychology.*
 Donald G. MacKay, Ph.D., *Assistant Professor of Psychology.*
 Ronald A. Mann, Ph.D., *Adjunct Assistant Professor of Psychology.*
 Dennis J. McGinty, Ph.D., *Adjunct Assistant Professor of Psychology.*
 Kazuro Nihira, Ph.D., *Assistant Professor of Medical Psychology and Psychology in Residence.*
 Allan J. Pantle, Ph.D., *Assistant Professor of Psychology.*
 David A. Parker, Ph.D., *Adjunct Assistant Professor of Psychology.*
 Kelyn H. Roberts, Ph.D., *Assistant Professor of Psychology.*
 Edward K. Sadalla, Ph.D., *Assistant Professor of Psychology.*
 Alexander J. Tymchuk, Ph.D., *Assistant Professor of Medical Psychology and Psychology in Residence.*
 Thomas D. Wickens, Ph.D., *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.*
 Robert S. Berns, M.D., *Associate Physician Diplomat in Student Health Service and Associate Clinical Professor of Psychology.*
 Frances B. Berres, Ph.D., *Associate Head and Supervisor of Teaching in the Fernald School and Lecturer in Psychology.*
 William H. Brown, Ph.D., *Research Psychologist.*
 Daphne E. Bugental, Ph.D., *Assistant Research Psychologist.*
 Matthew W. Buttiglieri, Ph.D., *Associate Clinical Professor of Psychology.*
 Philip M. Carman, Ph.D., *Associate Clinical Professor of Psychology.*
 Leo M. Chalupa, Ph.D., *Assistant Research Psychologist.*
 Thomas Cullen, Ph.D., *Associate Research Psychologist.*
 Darrell C. Dearmore, M.A., *Associate in Psychology.*
 James W. Dorris, Ph.D., *Assistant Research Psychologist.*
 Allan E. Edwards, Ph.D., *Lecturer in Psychology.*
 Jerome R. Evans, Ph.D., *Assistant Research Psychologist.*
 Carl Faber, Ph.D., *Lecturer in Psychology.*
 Ruth Forer, Ph.D., *Assistant Research Psychologist.*
 Louis Friedman, Ph.D., *Lecturer in Psychology.*

- James E. Gardner, Ph.D., *Lecturer 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.*
 Donald Griffin, Ph.D., *Lecturer in Psychology.*
 Charlyne T. Herbert, Ph.D., *Associate Clinical Professor of Psychology.*
 Harrington V. Ingham, M.D., *Associate Clinical Professor of Psychiatry and Psychology.*
 Margaret Hubbard Jones, Ph.D., *Research Psychologist in Engineering and Psychology.*
 Richard D. K. Josslin, Ph.D., *Lecturer in Psychology.*
 Takaaki Koyazu, Ph.D., *Visiting Assistant Research Psychologist.*
 Leonore Rice Love, Ph.D., *Lecturer in Psychology.*
 John D. Lovell, Ph.D., *Assistant Research Psychologist.*
 Angelica W. Macadar, M.D., *Assistant Research Physiologist.*
 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.*
 John W. McKelligott, Ph.D., *Associate Clinical Professor of Psychology.*
 Sigrid R. McPherson, Ph.D., *Lecturer in Psychology and Assistant Research Psychologist.*
 Norman Miller, Ph.D., *Research Psychologist.*
 Wilbur E. Morley, Ph.D., *Lecturer in Psychology.*
 Herbert A. Moskowitz, Ph.D., *Research Psychologist in Engineering and Psychology.*
 Philip Oderberg, Ph.D., *Lecturer in Psychology.*
 Barbara M. Ornelas, Ph.D., *Assistant Research Psychologist.*
 James O. Palmer, Ph.D., *Associate Clinical Professor of Medical Psychology and Lecturer in Psychology.*
 Frank T. Price, Ph.D., *Acting Assistant Professor of Psychology.*
 George F. Seacat, Ph.D., *Clinical Professor of Psychology.*
 Madeleine Schlag-Rey, *Doctor en Sciences, Sociales, Assistant Research Psychologist.*
 Manuel J. Smith, Ph.D., *Assistant Clinical Professor of Psychology.*
 Zanwill Sperber, Ph.D., *Lecturer in Psychology.*
 Linda L. Taylor, Ph.D., *Acting Assistant Professor of Psychology.*
 Zev Wanderer, Ph.D., *Lecturer in Psychology.*
 Kathryn L. West, Ph.D., *Assistant Research Psychologist.*
 Carol K. Whalen, Ph.D., *Assistant Research Psychologist and Assistant Professor of Social Ecology.*
 Barbara Stewart Wilbur, Ph.D., *Associate Clinical Professor of Psychology.*
 Glenn F. Wilson, Ph.D., *Assistant Research Psychologist.*
 Gary M. Yontef, Ph.D., *Lecturer in Psychology.*
 Seymour Zelen, Ph.D., *Lecturer in Psychology.*
 Tamar Zelniker, Ph.D., *Assistant Research Psychologist.*

The Major in Psychology

Training in Psychology at UCLA emphasizes the idea of Psychology as a biosocial laboratory science. To meet the diverse needs of students, there are three different major curricula: (A) The Psychology Major, (B) The Quantitative Psychology Major, (C) The Psychobiology Major.

Students should note that all courses required for these majors (which include lower

division courses, major courses, and related fields courses) must be taken for a letter grade.

The Psychology Major

The Psychology Major program is intended to give students broad training in the biosocial science of Psychology.

Required Lower Division Courses for the Psychology Major. Broad training in general

science is required for the major in Psychology. The required lower division courses are as follows: Anthropology 11; Biology 1A or Biology 2; Chemistry M2; Engineering 10; Mathematics 2A-2B or 3A-3B or 11A-11B; Physics M10; Psychology 10; Psychology 41 or Mathematics 50.

It should be noted that the above are the minimum requirements in preparing for the major. More advanced courses in science would provide stronger preparation for the major.

Required Upper Division Major Courses. (Admission to the major and to certain of the courses listed below is limited to students who have completed *all* of the above preparation courses with a 2.0 grade-point average. See the section below entitled "Admission to the Various Undergraduate Majors" for the procedures to follow to enroll in the Psychology Major.) (1) All of the following content core courses: Psychology 110, 115, 120, 125, 135; (2) One of the following laboratory courses: Psychology 111, 116, 121, 143; (3) One of the following laboratory or field research courses: Psychology 126, 132B, 136, 137C, 170B, 174, 176; (4) An additional three upper division elective courses (or 12 units) in Psychology.

Related Courses Required for the Major. Six upper division courses are required, divided among not more than three related departments. Particular courses for this requirement will depend on a student's needs and interests. Students must receive prior approval for the pattern of courses used to meet this requirement. The Psychology Advising Office should be consulted for further information and appointments with faculty advisers. The adviser may approve up to twelve units of the following lower division courses: Chemistry 1C, 4A-4B-4C, 6A-6B-6C; Mathematics 12A-12B-12C, 13A-13B-13C; Physics 3C, 6A-6B-6C, 7A-7D. All six courses may be in the same department or divided as chosen between three related departments.

These requirements became effective for all UCLA entering Freshmen in Fall, 1971, and students transferring to UCLA in Fall, 1972, and for all current UCLA students who wish to be admitted to the Psychology Major. *Students enrolled as Psychology majors under previous catalog requirements must graduate by Summer 1975.*

The Quantitative Psychology Major

This major is an alternative to the Psychology Major. It provides students with

basic training in both quantitative skills and in Psychology. Quantitative and computer skills are important in all fields of Psychology and are a very positive aspect in the student's preparation for a career in Psychology or related fields.

Required Lower Division Courses for the Quantitative Psychology Major. Biology 1A or Biology 2; Chemistry M2; Engineering 10; Mathematics 11A-11B-11C; Physics M10; Psychology 10.

It should be noted that the above are minimum requirements in preparing for the major. More advanced courses in science would provide stronger preparation for the major.

Required Upper Division Quantitative Psychology Major Courses. (Admission to the Quantitative Psychology Major is limited to students who have completed certain of the above preparation courses with a 2.0 grade-point average. See the section below entitled "Admission to the Various Undergraduate Majors" for the procedures to follow to enroll in the Quantitative Psychology Major.) (1) One of the following sets of courses: Public Health 160A-160B or Mathematics 150A-150B or Mathematics 152A-152B or Engineering 193A-193B; (2) All of the following courses: Psychology 110, 115, 120, 125, 135; (3) Seven additional upper division courses in Quantitative Psychology, Mathematics, Biostatistics, Computer Science, and Systems Science. Two of these courses must emphasize research methodology in Psychology.

Particular courses for the last requirement will depend on a student's needs and interests. Students will consult their adviser for prior approval of courses to meet these requirements.

The Psychobiology Major

This major is an alternative to the Psychology Major and is designed for students who plan to go on to postgraduate work in psychobiology or the health sciences.

Required Lower Division Courses for the Psychobiology Major. Biology 1A-1B; Chemistry 1A-1B-1C, 4A-4B-4C, 6A-6B-6C; Engineering 10; Mathematics 3A-3B-3C or 11A-11B-11C; Physics 6A-6B-6C; Psychology 10; Psychology 41 or Mathematics 50.

Required Upper Division Psychobiology Major Courses. (Admission to the Psychobiology Major is limited to students who have completed certain of the above lower division courses with a 2.0 grade-point

average. See the section below entitled "Admission to the Various Undergraduate Majors" for the procedures to follow to enroll in the Psychobiology Major.) (1) All of the following courses: Biology 129 or Psychology 118A; Biology 166, 171; Psychology 110, 111, 115, 116, 120; (2) One of the following courses: Psychology 125, 127, 130, 135, (3) Two of the following courses: Psychology 118B, 118C, 119A, 119B, Biology 111, 115, 123, 124, M132, 138, 144, 153, 158, 161, 169, 173, 177. Particular courses for the last requirement will depend on a student's needs and interests. Students will consult their adviser for prior approval of courses to meet these requirements.

Admission to the Various Undergraduate Majors. Admission to the three majors described above and enrollment in certain courses required by the majors is limited to students who have completed certain lower division preparation courses. *Students must complete the preparation courses listed below for the different majors with a 2.0 grade-point average before they can enroll in certain upper division required Psychology courses.* While students are completing the lower division preparation courses, they should be enrolled as *Prepsychology Majors*. Students may enroll in this premajor at the College of Letters and Science in Murphy Hall. Early in the quarter in which the student is completing the preparation courses, he should go to the Psychology Advising Office, 1531 Franz Hall, for advising and admission to one of the majors.

The required preparation courses for admission to the majors are: (1) *The Psychology Major*: Anthropology 11; Biology 1A or 2; Chemistry M2; Engineering 10; Mathematics 2A-2B or 3A-3B or 11A-11B; Physics M10; Psychology 10 and 41; (2) *The Quantitative Psychology Major*: Biology 2; Chemistry M2; Engineering 10; Mathematics 11A-11B; Physics M10; Psychology 10; (3) *The Psychobiology Major*: Biology 1A; Chemistry 1A; Engineering 10; Mathematics 3A-3B or 11A-11B; Physics 6A; Psychology 10 and 41.

Advising of Students. Students should consult the Psychology Advising Office, 1531 Franz Hall, for questions regarding the major and to make appointments with faculty advisers.

Preparation for Graduate Work in Psychology. Although requirements for admission to graduate programs in Psychology in most universities will be satisfied by the above major requirements, students should

realize that both his admission to graduate work and his progress towards his degree will be impeded in certain areas of Psychology if additional preparation is not obtained at the undergraduate level. For this reason, students who plan to do graduate work in psychology are advised to take additional work in methodology and statistics, and to take advantage of the many advanced undergraduate courses in specific fields offered both by the Psychology Department and related departments. Students might also note that graduate students at UCLA are expected to have a course in History and Systems of Psychology before completing the doctoral program. This course may be taken at the undergraduate level.

Students should 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. The Department no longer requires a foreign language except in certain areas such as Social Psychology and Measurement/Psychometrics; but at many other universities two foreign languages are required.

Honors Program in Psychology. The Honors Program is intended to provide exceptional students with an opportunity for advanced research and study under the tutorial guidance of a member of the faculty. Students are selected for the program at the end of their junior year. During their senior year, Honors students participate in an Honors Seminar and work towards the completion of a formal bachelor's thesis. A student whose thesis is judged acceptable by the Honors Committee is awarded his degree with Honors or Highest Honors in Psychology. Interested students should consult the Psychology Advising Office for further information and application forms.

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 510.) 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 31 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 and quantitative) 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 December 30 for consideration for the following fall quarter. Graduate students are admitted only once a year in the fall. 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 December 30 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 150. A thesis is not required for the M.A. degree.

Ph.D. Degree. Eligibility for an oral qualifying examination and advancement to candidacy requires prior qualification in the departmental core courses; qualification in comprehensive examinations in areas of the candidate's specialization; and, for students in some areas, the passing of a reading comprehensive examination in one approved foreign language or a substitute program of courses in research methods. 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 many graduate students obtain work in the profession as assistants or trainees, or receive one of the several 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.

A general introduction including the topics of learning, perception, thinking, intelligence and personality. Mr. Parducci

15. Introductory Psychobiology.

(Formerly numbered 12.) A survey of genetic, evolutionary, physiological, pharmacological and experiential factors affecting behavior. Using the comparative approach where appropriate, the relevance of biological mechanisms to an understanding of man and his interaction with his environment will be emphasized. Mr. Butcher, Mr. Ellison, Mr. Novin

41. Psychological Statistics.

Prerequisites: Mathematics 2A-2B, or 3A, or 11A. Basic statistical procedures and their application to research and practice in various areas of psychology. Mr. Comrey, Mr. Friedman

50. Introduction to Psychological Research.

Prerequisites: course 10, 41. The philosophy, orientation, and methodology of the science of psychology; an examination of current faculty research in the various content areas of psychology. This course is intended to give potential majors a realistic picture of the nature of the field and a preview of the emphasis of the upper division major coursework. Mr. Holland

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.

Mr. Faber

95. Lower Division Seminars.

Prerequisite: course 10. Open only to Freshmen and Sophomores. Intensive analysis in seminar situations of selected topics of current psychological interest. See the Schedule of Classes for current topics and instructors. May be repeated more than once for credit.

The Staff

Upper Division Courses

The following courses have only Psychology 10 as the prerequisite plus the prerequisites listed with each course: 119A, 119B, 127, 130, 132A, 132B, 134, 135, 137A, 137B, 137C, 148, 149, 170A, 180A, 180B, 184, 185, 189. For special topics courses such as 195, prerequisites will depend upon the nature of the course. The prerequisite to other upper division courses are all courses listed under *Admission to the Various Undergraduate Majors*.

102. History and Systems of Psychology.

Prerequisite: senior standing or consent of the instructor. An historical and systematic analysis of psychological thought and points of views.

Mr. Jones

110. Fundamentals of Learning.

Prerequisite: course 41. 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. Carder, Mr. Houston

111. Learning Laboratory.

Prerequisite: course 41. Prerequisite or concurrent: course 110. Laboratory experience with techniques in the study of learning especially with animals.

Mr. Carder

112A. Human Learning.

Prerequisite: course 110. Acquisition, retention, and transfer of verbal and nonverbal human learning.

Mr. Houston

***112B. Theories of Learning.**

Prerequisite: course 110. Critical discussion of the major theories in the light of experimental evidence.

Mr. Dallett

112C. Thinking.

Prerequisite: course 110. An analysis of experimental studies of problem solving, reasoning, insight, concept, formation, and related topics.

Mr. Roberts

112D. Motivation.

Prerequisite: course 110. Theories and experimentally determined facts concerning drives, needs, preferences, and desires.

Mr. Carder

***112E. Current Topics in Learning.**

Prerequisite: course 110. A study of related issues in the psychology of learning. Topics will vary with the interests of the instructor and the class. May be repeated for credit with permission of the instructor.

The Learning Staff

115. Physiological Psychology.

Prerequisite: Biology 2 and Psychology 41. For non-psychology majors, Biology 1A, 1B and consent of the instructor. Integrative activities, receptor and effector processes in relation to neuromuscular structure and function. Facts, problems and methods.

Mr. Ellison, Mr. Krame, Mr. Liebeckind

118. Physiological Psychology Laboratory.

Prerequisite: course 41. Prerequisite or concurrent: course 115. Laboratory experience with various topics in physiological psychology.

The Physiological Staff

117. Seminar in Psychobiology.

(Formerly numbered 117C.) Prerequisite: course 115. Advanced topics in brain and behavior. May be repeated for credit with permission of instructor.

Mr. Liebeckind

118A. Comparative Psychobiology.

(Formerly numbered 117B.) Prerequisite: course 115. A survey of the determinants of species-specific behavior including genetic influences and learning.

Mr. Jerison

118B. Behavioral Pharmacology.

Prerequisite: course 115. Experimental and theoretical treatment of drug-behavior relationships. Particular emphasis on behavior and pharmacological mechanisms of drug action and drug interaction with neuronal function; drugs as tools to investigate various behavior processes such as mood, aggression, learning and motivation; experimental studies of addiction.

Mr. Butcher

118C. Psychophysiology of Motivation.

Prerequisite: course 115. The basic psychophysiology, including brain and endocrine mechanism, involved in the control of motivation. Discussion of homeostatic drives such as hunger and thirst and nonhomeostatic drives such as reproductive behavior will be emphasized.

Mr. Ellison, Mr. Novin

119A. Selected Studies in Human Psychophysiology.

(½ course)

Prerequisites: Upper division or graduate status; course 15 or other comparable biological background. A consideration of research or interactions between mental and physiological functions. Both psychogenic and somatogenic influences are discussed, including psychosomatic disorders and organic changes or states that alter mental activity and other behavior (e.g., hormones, drugs, etc.).

Mr. Wenger

119B. Selected Studies in Human Psychophysiology.

(½ course)

Prerequisites: Concurrent or prior enrollment in Psychology 119A or equivalent, and consent of Instructor. (Priority will be given to graduate students and seniors in Psychology.) This course provides experience (a) in electrophysiological recording of responses in man in selected psychophysiological experiments, and (b) in analyzing such data and in the preparation of reports.

Mr. Wenger

120. Perception.

Prerequisite: course 41. Methods and approaches to the study of perception. Experimental results, theoretical interpretations, and demonstrations.

Mr. Jones, Mr. Fantle, Mr. Thomas

* Not to be given, 1972-1973.

121. Perception Laboratory.

Prerequisite: course 41. Prerequisite or concurrent: course 120. Laboratory experience with various topics in perception. Mr. Jones

122. Language and Communication.

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

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. Current Topics in Perception.

Prerequisite: course 120. Advanced consideration of special topics in perception. May be repeated for credit with consent of the instructor. Mr. Jones, Mr. Pantle

125. Personality.

A survey of the major topics in the field of personality, including personality theory, personality assessment, and the physiological behavior and cultural role of perception, learning and motivation in personality. Mr. Bentler, Mr. Feshbach, Mr. Sadalla

126. Personality Laboratory.

Prerequisite: course 41. Prerequisite or concurrently with special permission: course 125. Laboratory experience with various topics in personality. Mr. Weiner

127. Abnormal Psychology.

Study of the dynamics and prevention of abnormal behavior, including neuroses, psychoses, character disorders, psychosomatic reactions and other abnormal personality patterns. Mr. Freitag, Mr. Goldstein, Mr. Rodnick

*128. Structure of Individual Differences.

Prerequisite: Psychology 41. Research approaches to the study of individual differences in abilities, personality, interests, attitudes, and values. Measurement of these individual differences. Utilization of individual differences for selection and guidance. Mr. Comrey

129A. Personality Measurement.

Prerequisite: course 125. The rationale, 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.

Prerequisite: course 125. 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.

Prerequisite: course 125. 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

129D. Special Topics in Personality.

Prerequisite: course 125. Study of selected topics in the psychology of personality. Topics will vary with the interests of instructor and class. May be repeated for credit by consent of instructor. Personality Staff

130. Developmental Psychology.

An elaboration of the developmental aspects of physical, mental, social, and emotional growth from birth to adolescence. Mr. Faw, Mr. Jeffrey

*131. Developmental Psychology Laboratory.

Prerequisite or concurrent: course 130. Observation and experimentation in developmental psychology. The Staff

132A. Learning Disorders.

Prerequisite: course 10 and 41. An examination of the psychological factors underlying the understanding, diagnosis and treatment of reading and other learning disorders in children, adolescents and young adults. A background in developmental psychology, e.g., Psychology 130, is recommended for students enrolled in this course. Mr. Faw, Mr. Griffin

132B. Learning Disorders: Laboratory.

Prerequisite or concurrent: course 132A, and upper division standing. Discussion and demonstration of alternative educational therapy techniques; supervised laboratory experience with remedial cases in the Fernald School as the student is ready. Mrs. Berres

132C. Learning Disorders: Advanced Laboratory.

Prerequisite: course 132B and consent of the instructor. Advanced work at the Fernald School in the diagnosis of learning disorders and the designing and implementation of research and treatment programs. May be repeated once for credit. Mrs. Berres

133A. Adolescence.

Prerequisite: course 130 or consent of the instructor. The physical, psychological and social development of the adolescent. Miss Rhulman

*133B. Exceptional Children.

Prerequisite: course 130. Study of the issues and research problems in the areas of mental retardation, giftedness, learning disorders, emotional disorders and childhood psychosis. Mr. Tymchuk

*133C. Psychological Development in the Adult Years.

Prerequisite: course 130 or consent of the instructor. Theory and research on changes in motivation, aptitudes and abilities as related to genetics, age, sex and socio-cultural variables. The Staff

133D. Psychological Development of the Minority Child.

Prerequisites: courses 127, 130, upper division Psychology standing and consent of the instructor.

* Not to be given 1972-1973.

An examination of the theoretical issues and research problems relating to the development of minority children. Topics will include intelligence, identity, survival skills, family structure and community development. Mr. Price

133E. Current Issues in Developmental Psychology.

Prerequisite: course 130 and upper division Psychology standing. A critical examination of current issues in developmental psychology. The specific issues of concern will vary depending on the interests of the class and instructor. May be repeated with permission of the instructor.

The Developmental Staff

134. Educational Psychology.

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 Rhulman

135. Social Psychology.

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. Kanouse, Mr. Raven

136. Social Psychology Laboratory.

Prerequisite: course 41. Prerequisite or concurrent: course 135. Laboratory experience with such topics as small group behavior, attitude measurement, and interpersonal influence. Mr. Gerard, Mr. Shure

137A. Group Behavior.

Prerequisite: course 135. Psychology of interdependence, group membership, leadership, and social influence. Mr. Kelley

137B. Attitude Formation and Change.

Prerequisite: course 135. Effects of propaganda, personal influence, socialization and social structure on private attitudes and public opinion. Mr. Gerard

137C. Survey Research in Psychology.

Prerequisite: course 135. 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

137D. Special Topics in Social Psychology.

Prerequisite: course 135. Study of selected topics in social psychology. The Social Staff

142. Advanced Statistical Methods in Psychology.

Prerequisite: course 41. Chi square, special correlation methods, multiple regression, non-parametric methods, analysis of variance, reliability and validity. Mr. Comrey

*143. Foundations of Psychological Investigation.

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.

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.

Introduction to the applications of psychology in industry and business. Mr. Barthol

149. Problems in Human Relations.

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

*150. Mathematical Models in Psychology.

Prerequisites: Mathematics 3C or 11C, Engineering 10, or consent of the instructor. Review of theoretical models and the experimental evidence for these models in various areas of Psychology. Topics will include mathematical computer models of learning, perception, cognition and personality. Recommended for Quantitative Psychology Majors. Mr. Friedman

151. Computer Applications in Psychology.

Prerequisite: Engineering 10 and consent of the instructor. Topics will include hardware and software computer problems in the design, control, and analysis of experiments; programming problems arising in the evaluation of models of psychological processes of the various content areas such as learning, perception, social, personality, and clinical. Recommended for Quantitative Psychology Majors. Mr. Carterette

*160. Problems in Humanistic Psychology.

Prerequisites: course 125 and consent of the instructor. Humanistic psychology and its impact on general psychology; problems in phenomenology and existential theory; study of central humanistic concepts such as "empathic understanding," "shared experience," "inclusion," and the like. Mr. Dallett

162. The Psychological Approaches of Henry

Murray: The Study of Biography.

(Formerly numbered 198.) Prerequisite: consent of the instructor. The study of lives and the personality theory of Henry Murray, touching upon autobiographical writings and biographical materials; and personality as a dynamic system of growth and change. Creative, proactive, normal and super-normal aspects of personality; the roles of values in the study of personality, society and culture. Mr. Shneidman

M163. Death and Suicide: Psychological and Sociological Aspects.

(Formerly numbered 198. Same as Sociology M158.) The definition and taxonomy of death; the new permissiveness and taboos relating to death; the romanticization of death; the role of the individual in his own demise; the modes of death; development of ideas of death through the life span; ways in which ideas of death influence the conduct of lives; the impact of dying on the social structure surrounding the individual; preventive, interventive and postventive practices in relation to death and suicide; partial death; megadeath; lethality; the psychological autopsy; the death of institutions and cultures. Mr. Shneidman

165. Psychology of Women.

The course covers the psychology of women and psychological literature relevant to both men and women. Some topics included are physiological and

* Not to be given, 1972-1973.

personality differences between the sexes, sex role development and role conflict and women and traditional therapy. Ms. McIver

168. Environmental Psychology.

Prerequisite: Psychology Majors or Majors in Analysis and Conservation of Ecosystems, and consent of the instructor. A research-oriented course which surveys theoretical and methodological issues which comprise the area of environmental psychology. Issues discussed will include application of the concept of ecosystems to human behavior, perception and evaluation of environmental attributes, the relationship between environmental variables such as population density, urban design, and behavior patterns such as aggression, interpersonal communication, life style, etc. Mr. Sadalla

170A. Behavior Modification.

Prerequisites: Upper division standing. Applied behavior theory; a study of the application of principles derived from learning theory, especially modelling and reinforcement, to behavior problems of retarded and autistic children, adult psychotic disorders, reading disorders, etc. Lectures, discussions and demonstrations. Mr. Lovaas

170B. Fieldwork in Behavior Modification.

Prerequisites: course 170A. Psychology Junior or Senior Major standing and permission of instructor. Advanced discussion and fieldwork in Applied Behavior Theory; especially to problems of retarded and autistic children, adult psychotic disorders, etc. Two hours discussion and eight hours fieldwork per week; may be repeated once for credit. Mr. Lovaas

174. Interpersonal Process Analysis.

Prerequisites: course 41, 127, and Junior and Senior Psychology Major standing. An introduction to the conceptual tools for analyzing interpersonal structures and functions in goal-oriented human interaction such as psychotherapy, persuasion, courtship, etc. Class sessions will integrate small group exercises with lecture and discussion. Additional laboratory work to be arranged. Mr. Goodman

*175. Community Psychology.

Prerequisites: junior or senior psychology major standing and consent of the instructor. The application of psychological principles to the understanding and solution of community problems. Topics will include community development, community mental health problems, drugs, racism, and rehabilitation of prisoners. Mr. Price, Mr. Rodnick

176. Experimental Community Psychology.

Prerequisites: course 127 and consent of the instructor. Examination and experimental application of concepts drawn from interpersonal and community psychology for understanding the behavior of individuals in structured social systems (communities, schools, mental hospitals, prisons, etc.). Mr. Freitag, Mr. Rodnick

180A. Feeling and Emotion. (½ course)

(Formerly numbered 117A.) Prerequisite: Recommended: Psychology 15 or equivalent. Studies of emotional behavior with particular emphasis on the critical evaluation of theories of emotion. Mr. Wenger

180B. Laboratory: Feeling and Emotion. (½ course)

Prerequisites: Concurrent or prior enrollment in Psychology 180A or equivalent and consent of Instructor. Priority will be given graduate students and seniors in Psychology. This course provides

experience (a) in electrophysiological recording of responses in man as elicited by selected emotion-provoking stimuli and (b) in analyzing such data and in the preparation of reports. Mr. Wenger

184. Disorders of Human Communication.

Prerequisite: junior or senior Psychology major standing. A clinical approach to speech problems with emphasis on stuttering and neurological disorders and their treatment. Mr. Sheehan

185. Music, The Individual, and Society.

Prerequisite: upper division standing. Emphasis will be on the social psychology of musical style; interrelationships of musical style with social structure and patterns of social interaction; stability and change of musical style over time. Mr. Dowling

*187. Perception of Music.

Prerequisite: upper division standing. The nature of musical sound; universal constraints imposed on music by the auditory system; effects of experience on music perception; emotional reactions to music. Mr. Dowling

189. Psychological Approaches to the Social Sciences.

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. Holland

195. Current Issues in Psychology.

Prerequisites: Junior or Senior Psychology major standing. Some sections may require permission of instructor. A study of selected current topics of psychological interest. See Schedule of Classes for topics and instructors to be offered each quarter. This course may be repeated for credit, and may apply as elective units on the major. The Staff

199. Directed Individual Research and Study.

(½ to 1 course)

Prerequisites: Junior or Senior Psychology major standing, consent of the instructor and the Chairman of the Department. To be arranged with individual faculty members. Consent is based on a written proposal outlining the proposed course of study. Students should consult the Psychology Advising Office, Franz Hall 1531A, for further information and approval forms. Note the following regulations concerning 199 courses: A student may take only one 4-unit 199 course in Psychology per quarter. Only 4 units of 199 may be applied toward the Psychology major elective course requirement. Only one Psychology 199 course may be taken for a letter grade; additional Psychology 199 courses may be taken only on a passed/not passed basis. The Staff

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

* Not to be given, 1972-1973.

204A-204G. Seminar in Critical Problems. In Learning.

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. Roberts

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. Psychophysiology of Psychopathology.

Prerequisites: consent of the instructor. Psychology 204C and Biomathematics 213 recommended. Review of research and theory concerned with the psychophysiology and psychopathological conditions such as the schizophrenias, manic-depressive disorders, and sociopathy. Emphasis will be on the psychophysiological correlates of learning, attention, and motivation. Students will have an opportunity for experimentation with different psychopathologies in a computer-based laboratory located in a mental hospital. (Enrollment is limited.)

Mr. Maltzman, Mr. Parker, Mr. Ziskind

***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. The Experimental Analysis of Behavior.

A survey of experimental approaches to the assessment of psychological process. Measurement of motivation and emotion. Particular emphasis on operant technology.

204G. Mathematical Models of Learning and Memory.

Prerequisite: Psychology 250A or consent of instructor. Survey of various quantitative models for learning and memory processes, the emphasis being on human verbal learning. Topics to be covered will include paired-associate learning, concept identification, and the structure of memory. Mr. Wickens

205. Physiological Correlates of Behavior.

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

206. Psychophysiology of Brain Function.

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. Lindaley

207A-207B-207C. Seminar in Physiological Psychology.

Prerequisite: course 115 or the equivalent.

Mr. Butcher, Mr. Krasne, Mr. Liebeskind

***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.

Mr. Krasne

211. Perception.

Basic experiments and theories of perception and judgment, with applications to learning, motivation, and personality. Laboratory demonstrations and individual experiments.

Mr. Thomas

***212. Advanced Perception.**

Advanced study of topics in perception with emphasis on theories of perception.

Mr. Jones

213. Psychology of Vision.

An advanced treatment of psychophysiology and psychophysics of vision with special attention to modern theories.

Mr. Pantle

***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.

Mr. Holland

220. Social Psychology.

An intensive consideration of the concepts, theories, and major problems in social psychology.

The Social Staff

221. Seminar in Attitude Formation and Change.

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. Kanouse

222A-222B. Seminar in Group Behavior.

Prerequisite: course 220, 227, or consent of the instructor. Special topics in interpersonal relations and group dynamics. Power control, structure and organization, group functioning.

Mr. Kelley, Mr. Raven

223. Survey Methods in Psychology.

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. Centers

224. Experimental Methods in Social Psychology.

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. Shure

* Not to be given 1972-1973.

225. Seminar: Critical Problems in Social Psychology.

Prerequisite: course 220, 227, or consent of the instructor. May be repeated for credit with consent of the instructor.

Mr. Centers, Mr. Kanouse, Mr. Kelley

***M226. Seminar in Behavioral Science and the Law.**

(Same as Law M333.) 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

***M228. Seminar in Political Psychology.**

(Same as Political Science M224G.) 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

***229A-229B. Issues in the Social Development of the Minority Child.**

Prerequisite: Consent of instructor and graduate status. A critical evaluation and integration of existing research on the social psychological development of the minority child. The two-quarter seminar will focus on the socialization of cognitive and personality style, with the goal of empirically clarifying the issues raised in this area of developmental study.

Mr. Collins, Mr. Price

***231. Seminar in Language and Communication.**

Prerequisites: courses 260A-260B.

Mr. Dowling, Mr. MacKay

232. Seminar in Judgment.

Consideration of topics in human judgment.

Mr. Parducci

234. Personality and Cognition.

A critical analysis of unified cognitive theories of personality combined with a consideration of relevant empirical literature. The work of such theorists as Kelly, Piaget, and Bruner will be considered along with experimental work in the areas of category theory, imagery, and meaning.

Mr. Sadalla

235. Personality.

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.

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.**

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.** 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.

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

242. Seminar in Developmental Psychology.

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.

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.**

Construction and analysis of mathematical models of behavior. Emphasis on applications to research in learning, perception, social, and other areas.

Mr. Holman, Mr. Wickens

***246. Seminar in Advanced Mathematical Psychology.**

247A-247B. Computer Techniques in the Behavioral Sciences.

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. Carterette

250A. Advanced Psychological Statistics.

Review of fundamental concepts. Basic statistical techniques as applied to the design and interpretation of experimental and observational research.

Mr. Wickens

250B. Advanced Psychological Statistics.

Advanced experimental design and planning of investigations.

Mr. Wickens

251A-251B. Research Methods.

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

* Not to be given, 1972-1973.

***252. Quantitative and Laboratory Methods in Psychology.**

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.

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.

Theory of measurement, law of comparative judgment, methods of unidimensional scaling, multidimensional scaling, and related topics of current interest.

Mr. Comrey, Mr. Holman

255. Quantitative Aspects of Assessment.

Fundamental assumptions and equations of test theory. Current problems in assessment.

Mr. Bentler

256. Seminar in Critical Problems in Psychological Measurement.

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. Dowling, Mr. Roberts

260B. Psycholinguistics II. Seminar.

Prerequisite: course 260A. Continuation of course 260A.

Mr. MacKay, Mr. Roberts

261A-261B-261C. Advanced Industrial Psychology.

Selection and training of employees, factors influencing efficiency of work.

Mr. Barthol

262. Special Problems in Industrial Psychology.

Mr. Barthol

263. Seminar in Cognitive Psychology.

Prerequisite: consent of the instructor. This seminar deals with current and historical views on how humans process complex information. Possible topics include experimental epistemology, attention, memory, pattern perception, language behavior and thinking.

Mr. MacKay, Mr. Dowling, Mr. Wickens

270. Issues and Concepts of Clinical Psychology.

Mr. Broen

271A-271B-271C. Clinical Psychological Methods.

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.

Course 401 must be taken concurrently, except with consent of instructor.

*272A. Introduction.

Mr. Sheehan

*Not to be given, 1972-1973.

272B. Psychotherapy with Adults. Mr. Ingham

272C. Clinical Intervention of Psychological Problems in Children. Mrs. Love

273. Advanced Interpersonal Processes.

Mr. Goodman

274A-274B. Group Therapy Dynamics.

Mr. Lehner

***275A-275B. Seminar in Abnormal Psychology.**

Mr. Coleman

M276A-276B. Seminar: Children with Learning Disorders.

Same as Education M280D-280E. Mr. Coleman

***277. Seminar in Clinical Psychology and Speech Pathology.**

Mr. Sheehan

278A-278B. Seminar in Motivation, Conflict and Neurosis.

Mr. Feshbach

279A-279B. Seminar in Research in Psychopathology.

Mr. Rodnick

280. Seminar in Experimental Psychodynamics.

Mr. Broen

281. Seminar in Behavior Therapy.

Mr. Lovaas

282. Interpersonal Forms—Analysis of Human Interaction Structures.

Conceptual and experimental study of six response modalities common to psychotherapy and everyday interaction; questions, silences, advisement, interpretation, self-disclosure, and reflection. Laboratory work will be performed in conjunction with lecture and seminar sessions.

Mr. Goodman

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)

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)

Prerequisite: consent of the instructor. Practical work in hospitals and clinics in diagnostic testing and psychotherapy with speech disorders.

Mr. Sheehan

409. Minority Poor Counseling.

Prerequisite: consent of the instructor. A program utilizing students to function as counselors to minority group members, which is being organized to work under the supervision of Student Health Psychiatry. Students will be trained in the counseling process and will serve as counselors to minority group members.

Mr. Berns, Mr. Ingham

***412. Psychological Interviewing and Case Study Methods.**

Procedures, methods, and problems in the collection of personal data in the interview situation.

451. Internship in Clinical Psychology. (1 or 2 courses)

Prerequisite: course 401. Open only to students who have passed departmental qualifying examination. May be repeated for credit. The Clinical Staff

454. Internship in Industrial Psychology. (½ to 1 course) The Staff**495. Presentation of Psychological Materials.**

Supervised practicum in undergraduate teaching. Students will serve as discussion section leaders in selected undergraduate courses. Mr. Friedman

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 2 courses)

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 concern of the client with systematic investigation 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 professional services to 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 therapy and 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.

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. Three courses focusing on learning disorders, Psychology 132A, lecture, 132B and 132C, laboratory, are specifically associated with the Fernald School programs. Psychology 132A provides an overview of the field and the opportunity to examine the etiology, diagnosis and treatment of learning difficulties. Psychology 132B affords the University student the unique opportunity to observe and to participate under supervision in the remediation of the academic deficiencies of Fernald School students. Psychology 132C

allows further and more independent participation in working with learning problems.

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, 51-279 Center for the Health Sciences)

Roslyn B. Alfin-Slater, Ph.D., *Professor of Nutrition.*

A. Ralph Barr, Sc.D., *Professor of Public Health.*

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 and Social Medicine 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 and Social Medicine,*

Professor of Medical Microbiology and Immunology and Professor of Epidemiology.

Wilfrid J. Dixon, Ph.D., *Professor of Biomathematics and Professor of Public Health.*

Olive Jean Dunn, Ph.D., *Professor of Biostatistics and Professor of Biomathematics (Vice Chairman of the Department).*

Lenor S. Goerke, M.D., M.S.P.H., *Professor of Public Health and Professor of Preventive and Social Medicine.*

Ralph Goldman, M.D., *Professor of Medicine and Professor of Public Health.*

M. Alfred Haynes, M.D., M.P.H., *Professor of Preventive and Social Medicine in Residence and Professor of Public Health in Residence.*

Marvin Hoffenberg, M.A., *Professor of Political Science in Residence and Professor of Public Health in Residence.*

Carl E. Hopkins, Ph.D., M.P.H., *Professor of Public Health (Chairman of the Department).*

Derrick B. Jelliffe, M.D., D.T.M. & H., D.C.H., M.R.C.P., *Professor of Public Health and Professor of Pediatrics.*

Raymond J. Jessen, Ph.D., *Professor of Management 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.*

Charles E. Lewis, M.D., Sc.D., *Professor of Public Health and Professor of Preventive and Social Medicine.*

Frank J. Massey, Jr., Ph.D., *Professor of Biostatistics, Professor of Preventive and Social Medicine and Professor of Biomathematics.*

Edward L. Rada, Ph.D., *Professor of 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 and Social Medicine.*

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.*

Daniel M. Wilner, Ph.D., *Professor of Public Health and Professor of Preventive and Social Medicine.*

Henry H. Work, M.D., *Professor of Psychiatry and Professor of Public Health.*

Telford H. Work, M.D., M.P.H., D.T.M.&H., *Professor of Infectious and Tropical Diseases, Professor of Medical Microbiology and Immunology and Professor of Preventive and Social Medicine.*

Gladys A. Emerson, Ph.D., *Emeritus Professor of Nutrition.*

John F. Kessel, Ph.D., *Emeritus Professor of Infectious Diseases.*

Frank F. Tallman, M.D., *Emeritus Professor of Psychiatry and Emeritus Professor of Public Health.*

Abdelmonem A. Affi, Ph.D., *Associate Professor of Biostatistics and Associate Professor of Biomathematics.*

Lawrence R. Ash, Ph.D., *Associate Professor of Public Health in Residence.*

Virginia A. Clark, Ph.D., *Associate Professor of Biostatistics and Associate Professor of Biomathematics.*

Roger Detels, M.D., *Associate Professor of Epidemiology and Associate Professor of Preventive and Social Medicine.*

Hector B. Garcia Manzanedo, M.A., Dr.P.H., *Acting Associate Professor of Public Health.*

Robert A. Mah, Ph.D., *Associate Professor of Public Health.*

Alfred K. Neumann, M.D., M.P.H., *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. Pogrud, 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.*

Emil Berkanovic, Ph.D., *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.*

Donald Du Bois, Dr.P.H., *Assistant Professor of Public Health in Residence and Assistant Professor of Preventive and Social Medicine in Residence.*

Earl S. Flowers, M.S., Ph.D., *Assistant Professor of Public Health.*

Michael S. Goldstein, Ph.D., *Assistant Professor of Public Health.*

David W. Hosmer, Jr., Ph.D., *Assistant Professor of Biostatistics.*

Isabelle Hunt, M.P.H., Dr.P.H., *Assistant Professor of Nutrition in Residence.*

Aaron E. Ifekwunigwe, M.D., M.P.H., D.T.M.&H., D.C.H., M.R.C.P., *Assistant Professor of Public Health in Residence and Assistant Professor of Pediatrics in Residence.*

William Shonick, Ph.D., *Assistant Professor of Public Health.*



Lilla Aftergood, Ph.D., *Assistant Research Biochemist.*

Charles I. Barron, M.D., *Associate Clinical Professor of Public Health.*

Arnold R. Beisser, M.D., *Lecturer in Public Health and Associate Clinical Professor of Psychiatry.*

Donald W. Belcher, M.D., *Lecturer in International Health.*

Harold V. Brown, M.P.H., Dr.P.H., *Lecturer in Public Health.*

Fred A. Bryan, M.D., *Lecturer in Public Health.*

Richard Call, M.D., *Associate Clinical Professor of Public Health.*

J. Alfred Cannon, M.D., M.P.H., *Lecturer in Public Health and Clinical Professor of Psychiatry.*

Jo Ann Cannon, M.P.H., Dr.P.H., *Lecturer in International Health.*

Edith M. Carlisle, Ph.D., *Assistant Research Biochemist.*

- 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.*
- Carl F. Coffelt, M.D., M.P.H., *Lecturer in Public Health.*
- Alvin Davis, M.D., *Associate Clinical Professor of Public Health.*
- John C. Dums, B.A., M.P.H., *Lecturer in Hospital Administration.*
- Kenneth M. Eastman, B.S., *Associate Clinical Professor of Public Health.*
- Wadie M. Elaimy, M.P.H., 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.*
- Toby Freedman, M.D., *Associate Clinical Professor of Public Health and Associate Clinical Professor of Preventive and Social Medicine.*
- Jay W. Freidman, D.D.S., M.P.H., *Researcher and Lecturer in Public Health.*
- Richard B. Froh, Pharm.D., M.P.H., *Lecturer in Public Health.*
- June D. Gorski, B.S., M.E., Dr.P.H., *Lecturer in Health Education.*
- Elizabeth A. Hefferin, Dr.P.H., *Associate Researcher and Lecturer in Public Health.*
- Gerald A. Heidbreder, M.D., M.P.H., *Lecturer in Public Health.*
- Deborah Hensler, A.B., *Assistant Researcher and Lecturer in Public Health.*
- Paul B. Hofman, B.S., M.P.H., *Lecturer in Hospital Administration.*
- Arthur C. Hollister, M.D., M.P.H., *Lecturer in Public Health.*
- Olive G. Johnson, B.A., *Lecturer and Specialist in Health Records Systems.*
- Charles Keeran, M.S.W., *Lecturer in Mental Hospital Administration.*
- Addie Lou Klotz, M.D., M.P.H., *Lecturer in Public Health and Lecturer in Preventive and Social Medicine.*
- 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., *Lecturer 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.*
- Irvin M. Lourie, M.D., M.P.H., *Lecturer in International Health.*
- Jerome W. Lubin, B.S., M.C.P., *Lecturer in Public Health.*
- Louis E. Mahoney, Jr., M.D., Dr.P.H., *Adjunct Assistant Professor of Public Health and Adjunct Assistant Professor of Preventive and Social Medicine.*
- 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 and Social Medicine.*
- Florence C. McGucken, M.S., *Lecturer in Nutrition.*
- Thomas C. McIndoe, B.S., M.P.H., *Lecturer in Public Health.*
- Jean L. Mickey, Ph.D., *Lecturer in Public Health.*
- Magda Moustafa Montasir, M.D., D.T.M.&H., *Assistant Researcher in Infectious and Tropical Diseases.*
- David M. Myers, B.A., M.P.A., *Lecturer in Medical Care Organization.*
- Jerome W. H. Niswonger, M.D., M.P.H., *Lecturer in International Health.*
- David Odell, A.B., M.H.A., *Lecturer in Hospital Administration.*
- George W. Prichard, M.D., J.D., M.P.H., *Lecturer in Public Health.*
- Harriet B. Randall, M.D., *Lecturer in Public Health.*
- Donald T. Rice, M.D., M.P.H., *Lecturer in Public Health.*
- Charles J. Roach, B.S., M.S., *Lecturer in Comprehensive Health Planning.*
- Robert S. Rooke, M.D., M.P.H., *Lecturer in Public Health.*
- Jack C. Rogers, B.S., *Lecturer in Public Health.*
- Martin B. Ross, M.P.H., *Lecturer in Hospital Administration.*

- David S. Sanders, M.D., M.P.H., *Lecturer in Public Health and Assistant Clinical Professor of Psychiatry.*
- Simon A. Sayre, M.D., *Lecturer in Public Health and Assistant Clinical Professor of Obstetrics and Gynecology.*
- Marian G. Selvin, B.S., M.P.H., *Associate in Public Health.*
- Charles L. Senn, M.S., *Lecturer in Public Health.*
- Laurens Silver, B.A., J.D., *Lecturer in Law and Lecturer in Public Health.*
- Robert L. Smith, M.D., M.P.H., *Associate Clinical Professor of Public Health.*
- Daniel Sullivan, B.A., M.P.H., *Lecturer in Public Health.*
- Helen Marie Summers, M.P.H., *Lecturer in Public Health.*
- Leo Tepper, M.D., M.P.H., *Lecturer in Public Health.*
- Packard Thurber, Jr., M.D., *Lecturer in Public Health and Associate Clinical Professor of Preventive and Social Medicine.*
- J. Albert Torribio, M.S.S.W., M.S.W., *Lecturer in Health Education.*
- Marsden Wagner, M.D., M.S., *Lecturer in Public Health.*
- J. Arthur Waites, Ph.D., *Lecturer in Hospital Administration.*
- 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, Lecturer in Preventive and Social Medicine and Associate Clinical Professor of Medicine.*

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. Zukin

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.

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

108. 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.

Prerequisites: Chemistry 1A or equivalent, and one course from Biology 1A, Bacteriology 6, 10, 100A. A broad coverage of the field of environmental health and ecological control. 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. McGucken

* Not to be given, 1972-1973.

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. McGucken

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. Pogrund

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. Johns

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

142. The World's Population and Food.

(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. Detels, Mrs. Stern

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.

Mr. Goldstein

150. Infectious Diseases and Public Health.

(½ course)

Prerequisite: junior standing with consent of the instructor. Introduction to infectious diseases of man emphasizing modes of transmission and control of etiologic agents of Public Health importance.

Mr. Schacher and 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

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.

The Staff

160C. Introduction to Biostatistics.

Lecture, three hours; laboratory, three hours. Prerequisite: courses 160A, 160B, or consent of the instructor. Design of experiments, analysis of variance, multiple and polynomial regression analysis, covariance analysis with biomedical applications.

The Staff

160D. Introduction to Biostatistics.

Lecture, three hours; laboratory, three hours. Prerequisite: course 160B or consent of the instructor. Introduction to concepts of probability used in medical science, enumeration statistics, nonparametric methods, and sequential analysis in medical trials.

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

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.**

Prerequisite: course 450A, Management 281. Interorganizational relationships between community health care institutions and the community they serve. Alternative intraorganizational functions and relationships in the hospital.

Mr. Odell, Mr. Ross, Mr. Waites

202A. 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

202B. 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

203. 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. Ifekwunigwe

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

208. 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. Environmental Physiology.

Prerequisite: courses 114A-114B-114C. Man's adaptive physiological and biochemical responses to the physical and chemical environment. Total organism and cellular reaction to such stimuli as temperature, atmospheric gaseous and particle composition, radiation in the electromagnetic spectrum, noise, and chemical pollutants. Mr. Pogrand

224A-224B. Environmental Toxicology. (½ course each)

Prerequisite: courses 114A-114B-114C. Essentials of toxicology, stressing selective toxicity, mechanisms of action, statistics of dose response, and discussion of physical, chemical and biological agents that adversely affect man and environmental quality. Mr. Flowers

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. The Staff

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. Mr. Garcia

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. Mr. Torribio

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. The Staff

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. Goldstein

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. A&B, 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. A&B, 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

M245A. Research Methods in Community Health.

(Same as Anthropology M292.) 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.

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 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

245C-245D. Evaluative Research in Health and Mental Health Settings.

Prerequisite: courses 160A, 160B, 245A, 245B or equivalent. Principles, philosophy, and behavioral sciences methodology appropriate in evaluating programs aimed at reducing morbidity and mortality; disease detection programs; and rehabilitation programs in health and mental health fields. Mr. Reeder, Mr. Wilner

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. Detels

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. Detels and the Staff

M249A. Sociocultural Aspects of Health and Illness.

(Same as Sociology M249A.) Prerequisite: course 149 or graduate standing in sociology, anthropology or psychology and consent of the instructor. The relationship between the sociological, cultural, and psychosocial factors in the etiology, occurrence, and distribution of morbidity and mortality. Emphasis is on life styles and other socioenvironmental factors associated with disease and mortality. Mr. Reeder

M249B. Sociocultural Aspects of Health and Illness.

(Same as Sociology M249B.) Prerequisite: course 249A or consent of the instructor. Sociological, cultural, and psychosocial factors in health and illness

behavior. Emphasis is on the relationship of these factors to definitions of illness, health care behavior, and professional-client relationships. Mr. Reeder

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

252. Seminar in Community Mental Health. (½ course)

Prerequisite: consent of the instructor. Community problems in mental disorders, mental retardation and delinquency and the social agencies developed to meet them. Suicide prevention, psychological problems of aging and the interrelationship of social and individual causes of mental disorders. Emphasis 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 290C.) 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

261. Seminar in Community Health Education. (½ course)

Prerequisite: consent of the instructor. Mr. Garcia

262. Current Problems with Mosquito Vectors.

Lecture, two hours; laboratory, six hours. Prerequisite: course 219; Biology 107, 181; 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.**(1½ 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 program.

Mr. Jelliffe

264. Current Problems with Metazoal Parasites.**(1½ course)**

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

265. Seminar in Epidemiology. (½ course)

Prerequisite: course 147 or 246A and 160A, or consent of the instructor. Student presentations of pertinent material examining the methods and principles of epidemiology as applied to specific diseases. May be repeated for credit.

Mr. Chapman, Mr. Detels 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. Locke

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. Wilner

274. Seminar in Environmental Toxicology. (½ course)

Prerequisite: consent of the instructor and courses 224A-224B. Review of current literature and research on toxic effects of environmental agents. May be repeated for credit.

Mr. Flowers

275. Seminar in Environmental Physiology. (½ course)

(Formerly numbered 275A-275B-275C.) Prerequisite: consent of the instructor. Topics in environmental physiology, such as aerospace and un-

dersea environment, natural resource contamination, pesticides, noise, and application of systems analysis. Student presentation of published papers or own research progress. May be repeated for credit.

Mr. Pogrund

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

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.

The Staff

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.

The Staff

286. Nutritional Problems in Developing Areas. (½ course)

(Formerly numbered Nutritional Science 256.) Prerequisite: consent of instructor. Manifestations and dietary treatment of nutritional deficiencies.

The Staff

290. 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. Population, Family and International 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.

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. Ross, Mr. Waites

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

403A-403B-403C. Field Studies in Comprehensive Health Planning.

Prerequisite: consent of the instructor. Preparation for and study of practical field work in all phases of comprehensive health planning such as areawide planning organizations, health agencies, and professional organizations.

Mr. Lubin and the Staff

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. Waites

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. Clinical experience in medical residence in the areas of Pulmonary Disease, Dermatology, Physical Medicine and Rehabilitation and Occupational Medicine.

The Staff

413. Biomedical Research Methods.

Lecture, two hours; laboratory, six hours. Prerequisite: consent of the instructor. Techniques of biomedical research for students in biological and paramedical disciplines. Emphasis is on techniques of experimental study of infectious diseases in laboratory animals, field zoonotic/epidemiologic studies and thesis/publication techniques.

Mr. Schacher

414. Parasitologic Methods.

Prerequisite: consent of the instructor. Open to qualified graduate and undergraduate students—course limitation of 12 students. Methods used in the laboratory diagnosis of parasitic diseases in the field, and laboratory aspects of research in parasitology.

Mr. Ash

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. Sayre

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.

The Staff

430. Practicum in Health Education. (1 or 2 courses)

(Formerly numbered 430C.) Lecture, two hours; laboratory, six or eighteen hours. Prerequisite: consent of the instructor. The study of community- and group-felt health needs as reflected by behavioral responses. Analysis of the data with respect to understanding the needs; and planning, implementing, and evaluating need-directed health education and medical care programs.

Mr. Garcia

434. Health Education in Clinical Settings.

(Formerly numbered 235.) 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

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.

The Staff

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

* Not to be given, 1972-1973.

445. Principles of Public Health Nutrition.

Lecture, two hours; field trips, three hours. Prerequisite: courses 114A-114B (114B may be taken concurrently) or equivalent courses in nutrition. Methods used in public health nutrition to assess and improve nutritional status of population groups. A survey of problems and practices of health agencies dealing with community nutrition. Mrs. Hunt

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. Lewis

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. 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

452A-452B. Community Mental Health.

Prerequisite: graduate status. Concepts of mental health, mental illness, prevention of mental disorders. Mental health in public health programs. Public health aspects of control of mental disorders. Epidemiology, program planning and legal aspects of mental disorders. Mr. Sanders

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 sponsorships and with varied scopes of coverage and benefits. Relationships to public and private medical care developments. The Staff

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

454. Issues and Problems of Local Health Administration. (½ course)

Analysis of organizational issues currently faced by local health departments in increasing the scope and quality of services; exploration of administrative problems and interagency relationships. Mr. Zukin

455. Financing Health Programs. (½ course)

Prerequisite: Economics 100 or consent of the instructor. Sources and costs of financing, conditions for repayment of funds, program budgeting, and evaluating goal attainments. Mr. Rada

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. (½ course)

(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

456C. Issues in International Health Administration.

(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. Katz

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 con-

ducting 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.
(1 course, ½ course)

Prerequisite: courses 147, 160A, 453B, and Management 403A-403B. Description of hospital data sources. Methods and tools for systematic application of quantitative analysis to hospital management. Mr. Hoffmann

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. Ross, Mr. Waites

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

(Department Office, 8907 Mathematical Sciences Building)

The Public Service major is currently under revision. Please consult the Public Service Curriculum Office (MS 8907) for a

description of the program and requirements that apply to students entering under the 1972-1973 catalog.

■ RADIOLOGICAL SCIENCES

(Department Office, BL-428, Center for the Health Sciences)

Leslie R. Bennett, M.D., *Professor of Radiological Sciences.*

John A. Campbell, M.D., *Professor of Radiological Sciences in Residence.*

Andrew H. Dowdy, M.D., *Professor of Radiological Sciences.*

Moses A. Greenfield, Ph.D., *Professor of Radiological Sciences.*

William N. Hanafee, M.D., *Professor of Radiological Sciences (Chairman of the Department).*

Joseph Jorgens, M.D., *Professor of Radiological Sciences in Residence.*

Edward A. Langdon, M.D., *Professor of Radiological Sciences.*

Norman S. MacDonald, Ph.D., *Professor of Radiological Sciences.*

Amos Norman, Ph.D., *Professor of Radiological Sciences.*

Leo G. Rigler, M.D., *Professor of Radiological Sciences in Residence.*

Justin J. Stein, M.D., *Professor of Radiological Sciences.*

George V. Taplin, M.D., *Professor of Radiological Sciences.*

Raymond L. Libby, Ph.D., *Emeritus Professor of Radiological Sciences.*

Richard E. Ottoman, M.D., *Emeritus Professor of Radiological Sciences.*

J. Michael Criley, M.D., *Associate Professor of Radiological Sciences and Cardiology in Residence.*

Julius H. Grollman, M.D., *Associate Professor of Radiological Sciences.*

Michael T. Gyepes, M.D., *Associate Professor of Radiological Sciences.*

Delores E. Johnson, M.D., *Associate Professor of Radiological Sciences and Medicine in Residence.*

Norman D. Poe, M.D., *Associate Professor of Radiological Sciences.*

Richard F. Riley, Ph.D., *Associate Professor of Radiological Sciences.*

Richard J. Steckel, M.D., *Associate Professor of Radiological Sciences.*

Milo M. Webber, M.D., *Associate Professor of Radiological Sciences.*

Gabriel H. Wilson, M.D., *Associate Professor of Radiological Sciences (Vice Chairman of the Department).*

Frederick S. Mishkin, M.D., *Associate Professor of Radiological Sciences in Residence.*

John R. Bentson, M.D., *Assistant Professor of Radiological Sciences.*

John E. Byfield, M.D., *Assistant Professor of Radiological Sciences in Residence.*

James D. Collins, M.D., *Assistant Professor of Radiological Sciences.*

J. Duncan Craven, M.D., *Assistant Professor of Radiological Sciences in Residence.*

Harvey S. Frey, M.D., Ph.D., *Adjunct Assistant Professor of Radiological Sciences and Biomathematics.*

David S. Goller, M.D., *Acting Assistant Professor of Radiological Sciences.*

L. Stephen Graham, Ph.D., *Assistant Professor of Radiological Sciences in Residence.*

Robert K. Gray, M.D., *Assistant Professor of Radiological Sciences in Residence.*

James L. Harpstreith, M.D., *Assistant Professor of Radiological Sciences.*

Michael Hayes, M.D., *Assistant Professor of Radiological Sciences in Residence.*

Barbara M. Kadell-Wootton, M.D., *Assistant Professor of Radiological Sciences.*

Ralph S. Lachman, M.D., *Assistant Professor of Radiological Sciences and Pediatrics in Residence.*

James W. Lecky, M.D., *Assistant Professor of Radiological Sciences.*

Eugene G. Petersen, M.D., *Adjunct Assistant Professor of Radiological Sciences.*

Benjamin J. Seligman, M.D., *Assistant Professor of Radiological Sciences in Residence.*

Richard C. Small, M.D., *Assistant Professor of Radiological Sciences in Residence.*

Harold D. Snow, D.V.M., *Adjunct Assistant Professor of Radiological Sciences.*

Peter Spiegler, Ph.D., *Assistant Professor of Radiological Sciences.*

Ronald W. Thompson, M.D., *Assistant Professor of Radiological Sciences.*

Marvin Weiner, M.D., *Assistant Professor of Radiological Sciences.*

Robert L. Carangi, M.D., *Adjunct Instructor in Radiological Sciences.*



Marvin Abrams, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Michael O. Anderson, M.D., *Adjunct Instructor in Radiological Sciences.*

William E. Adolph, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Sol R. Baker, M.D., *Associate Clinical Professor of Radiological Sciences.*

Edwin N. Barnum, M.D., *Clinical Instructor in Radiological Sciences.*

Larry P. Bilodeau, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Harry A. Bishop, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Louis J. Bonann, M.D., *Assistant Clinical Professor of Radiological Sciences.*

John D. Buckley, M.D., *Clinical Instructor in Radiological Sciences.*

Paul Y. M. Chan, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Luke W. M. Chang, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Marvin B. Cohen, M.D., *Assistant Clinical Professor of Radiological Sciences and Medicine.*

Albert B. Cole, M.D., *Clinical Instructor in Radiological Sciences.*

Robert L. Cook, M.D., *Clinical Instructor in Radiological Sciences.*

James G. Davis, M.D., *Associate Clinical Professor of Radiological Sciences.*

Arthur J. Day, M.D., *Assistant Clinical Professor of Radiological Sciences.*

Donald T. Desilets, M.D., *Associate Clinical Professor of Radiological Sciences.*

Earl K. Dore, M.D., *Associate Clinical Professor of Radiological Sciences.*

Harold L. Endlich, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Karl H. Falkenbach, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Darwood B. Hance, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Richard B. Hanchett, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Oscar Harvey, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Maurice M. Haskell, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Gerald Hassan, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Samuel B. Haveson, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Edward Helmer, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 James J. Hodge, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Richard B. Hoffman, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 John W. Horns, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Margaret A. Ingram, M.D., *Clinical Instructor in Radiological Sciences.*
 John J. Jares, M.D., *Associate Clinical Professor of Radiological Sciences.*
 William C. Johnson, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Arthur R. Kagan, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Roscoe L. Koontz, B.S., *Lecturer in Radiological Sciences.*
 Milton Kunin, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Buong P. Lau, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Robert A. Ledner, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Kenneth W. Lewin, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Joseph F. Linsman, M.D., *Associate Clinical Professor of Radiological Sciences.*
 Arthur G. Litman, M.D., *Associate Clinical Professor of Radiological Sciences.*
 James F. Mack, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Paul S. Mahoney, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 James E. Massman, M.D., *Clinical Instructor of Radiological Sciences.*
 Harvey S. Miller, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Harry A. Morewitz, Ph.D., *Lecturer in Radiological Sciences.*
 Jasper E. Morgan, Ph.D., *Clinical Professor of Radiological Sciences.*
 Lawrence S. Myers, Jr., Ph.D., *Lecturer in Radiological Sciences.*
 Ronald J. O'Reilly, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Theodore T. Ott, R.T., *Lecturer in Radiological Sciences.*
 Joseph A. Parks, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Harry Pearlman, Ph.D., *Associate Clinical Professor of Radiological Sciences.*
 Hyman Peck, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 William L. Pogue, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 J. Edson Price, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 David I. Rabinov, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Burton I. Rein, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Joseph E. Scallon, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Arthur F. Schanche, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Alfred L. Schmitz, M.D., *Associate Clinical Professor of Radiological Sciences.*
 Daniel H. Simmons, M.D., *Professor of Medicine.*
 Alan B. Skorneck, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Jerome H. Stulberg, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Edgar L. Surprenant, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Paddy Taber, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Joseph E. Thornhill, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Harry T. Vanley, M.D., *Clinical Instructor in Radiological Sciences.*
 Michael S. Wagner, M.D., *Assistant Clinical Professor of Radiological Sciences.*
 Henry S. Williams, M.D., *Associate Clinical Professor of Radiological Sciences.*
 John R. Woodruff, Jr., M.D., *Associate Clinical Professor of Radiological Sciences.*

Norman Zheutlin, M.D., *Associate Clinical Professor of Radiological Sciences.*
 Arthur S. Zimmerman, M.D., *Clinical Instructor in Radiological Sciences.*
 William J. Zontine, D.V.M., *Assistant Clinical Professor of Radiological Sciences.*

Requirements for Admission to Graduate Status

Candidates for admission to graduate status in the Department of Radiological Sciences 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, and radiation chemistry with applications in nuclear medicine, radiation therapy, and diagnostic radiology will be open to qualified students.

Requirements for the Degree of Master of Science in Medical Physics

General University Requirements. Candidates for the Master of Science degree in Medical Physics 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.

Requirements for the Doctoral Degree in Medical Physics

General University Requirements. Candidates for the Doctoral Degree in Medical Physics must meet the general requirements set by the Graduate Division for this degree. A series of written and oral examinations are required before advancement to candidacy.

Departmental Requirements. (1) Advancement to Candidacy. Advancement to candidacy is granted only after the student has passed preliminary written screening examinations and a qualifying oral examination in the physical, biological, and chemical foundations of medical physics. (2) Normally, graduate students will be expected to take courses 200, 202, 204, 206, 208, 260, and 266. Completion of additional courses may be recommended.

It should be noted that the Doctorate in Medical Physics is not granted merely upon completion of routine requirements as to examinations, courses, and dissertation; fulfillment of such requirements is a prerequisite. The Ph.D. will be granted only to stu-

dents 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.

Lecture and laboratory. Natural and induced radioactivity, interactions of nuclear radiations with matter, decay schemes, counting statistics, nuclear reactions, radiopharmaceuticals, isotope methodology, instrumentation, and radiation safety.

The Staff

201. Environmental Radiations.

The sources, physical properties, and biological hazards of ionizing radiations, ultraviolet and laser light, and microwave and acoustic radiations in the environment. Social benefit vs. technological risk will be evaluated.

Mr. Norman

202A-202D. Applications of Medical Physics to Clinical Problems.

202A-202B. Nuclear Medicine.

Mr. Bennett, Mr. Graham, Mr. Webber

202C. Diagnostic Radiology.

Mr. Collins, Mr. Spiegler, Mr. Steckel

202D. Radiation Therapy.

Mr. Langdon, Mr. Spiegler

204. Introductory Radiation Biology.

Lecture. Effects of ionizing radiation on chemical and biological systems.

Mr. Riley

206A-206B-206C. Radiological Physics.

(½ course each)

Lecture. 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. Prerequisite: consent of the instructor. The dosimetry of ionizing radiation, the interpretation of physical measurements and dosimetric units and the philosophy of protection design.

Mr. Morewitz, Mr. Spiegler

208A-208B. Medical Physics Laboratory.

(½ to 1 course each)

Laboratory. Techniques for measuring ionizing radiation; applications to x-ray and isotope dosimetry, radiation surveys. Mr. Greenfield, Mr. Koontz

209. The Quantitative Culture of Mammalian Cells.

(½ course)

Laboratory. Prerequisite: consent of the instructor. 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)

Seminar. Joint critical study by students and in-

structors of the fields of knowledge pertaining to medical physics. Periodic contributions are made by visiting scientists. Research in progress is discussed.
Mr. Norman, Mr. Riley

266A-266B-266C. Seminar in Nuclear Medicine.

(½ course each)

Seminar. Topics of current interest in nuclear medicine. Seminar intended for physicians, radiation physicists, and graduate students.
Mr. Webber

481. Angiographic Techniques. (¼ course)

Prerequisite: consent of the instructor. Laboratory. Beginning Radiology residents will be taught basic techniques of angiographic procedures, utilizing animals.
Mr. Grollman, Mr. Snow

596. Research in Medical Physics. (½ to 1 course each)

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.

May be taken any number of times on a "Satisfactory" (S) or "Unsatisfactory" (U) basis. A maximum of two courses, or 598 and 596 combined, may be used for M.S. credit. The Staff

599. Research for Dissertation. (1 to 3 courses)

Prerequisite: satisfactory performance on screening examinations. 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

■ ROMANCE LINGUISTICS AND LITERATURE (INTERDEPARTMENTAL)

Marc Bensimon, Ph.D., *Professor of French.*

Giovanni Cecchetti, Ph.D., *Professor of Italian.*

Donald F. Fogelquist, Ph.D., *Professor of Spanish.*

Claude L. Hulet, Ph.D., *Professor of Spanish and Portuguese.*

James R. Lawler, Docteur de l'Universite de Paris, *Professor of French.*

C. P. Otero, Ph.D., *Professor of Spanish and Romance Linguistics (Chairman).*

Edward F. Tuttle, M.A., *Acting Assistant Professor of Italian.*

The integration of linguistic and literary knowledge is taken to be one of the highest aims of this interdepartmental program.

Any student with a B.A. in French, Italian, Portuguese, or Spanish may be admitted to this interdepartmental program if his G.P.A. in upper division courses is 3.00 or better. During his first graduate year, the student who knows only the language of his major should prepare himself in at least one other Romance language so he can take courses in his minor no later than in his second year of graduate study. Every individual program should be worked out in close consultation with the appropriate adviser or advisers.

A Guidance Committee will be constituted for each student upon declaration of his field of specialization; in no case later than the end of the first quarter in the program.

Master's Degree. The Master's program will include a major and a minor. Twelve courses will be the minimal requirement if no deficiencies have to be made up. Six of these courses (at least five of them graduate) should be in the student's major language, with specialization either in linguistics or in literature. One course in the history or development of the major language is highly recommended. At least three courses should be in

the minor language, again with specialization in either linguistics or literature. In consultation with the Guidance Committee, the remaining three courses should be selected so as to be logically supportive of the student's major field of study. M.A. candidates without knowledge of Latin are expected to have a knowledge of Italian comparable to that required in Course 3 whether they specialize in linguistics or in literature.

Doctoral Degree. The Ph.D. program will include a major and two minors. The candidate with an M.A. may specialize in either linguistics or literature. A student specializing in linguistics may take as his major field one of the following: 1) The present-day grammar of the Romance language of his major interest and its relation to the grammars of its sister language and to language in general; 2) the development of the Romance language of his major interest in relation to its sister languages (and possibly other interrelated cultural aspects) from the perspective of historical linguistics; 3) the genetic and typological relationships of the Romance languages to other Indo-European languages and to language in general. The two minors can be other Romance languages, or one other Romance language and a sub-

field of Romance literature. The Ph.D. candidate specializing in literature may take as the major one of the following subfields in the literatures of at least two Romance languages: 1) Early Romance literature and philology; 2) Renaissance and Baroque; 3) Modern literature, preferably with emphasis on one century. The first minor can be one of the preceding subfields not chosen for the major. The second minor may be the same subfield or a new subfield for another language; or some other related subfield in the major language or in Romance linguistics. Besides the languages of his major and minor, the Ph.D. candidate is expected to acquire a good knowledge of Latin or Italian whether he specializes in linguistics or in literature. The student taking either option (2) or (3) of the specialization in linguistics or option (1) of the specialization in literature must have Latin 3 or the equivalent and will be required to pass the standard reading examination in German. (For the major in modern literature, however, the Guidance Committee shall determine the language coverage.) Some individual programs may require knowledge of other languages to be determined by the Guidance Committee.

In consultation with the appropriate adviser(s), courses should be selected with an eye to the organic relationship between them, preferably among those listed below and/or their prerequisites:

Introduction to Romanistics:
(Spanish M200)
(Italian 201)

Courses in Linguistics

Grammatical Theory:
(Linguistics 200 and 205)

Historical Linguistics:
(Linguistics 202)

Synchronic

Advanced Grammar:
(French 201)
(Spanish 204A and 206)

Historical

The Development of the Romance Languages:

Northern Gallo-Romance:
(French 204A-204B)

Southern Gallo-Romance:
(French 215E)

Hispano-Romance:
(Spanish M203-203B)

Italo-Romance:

(Italian 210A)

Romance Dialectology:
(Spanish 209)

Indo-European Linguistics:
(Indo-European Studies 210)

Romance Linguistics:
(Linguistics 225G)

Medieval Latin:
(Latin 231A-231B)

Vulgar Latin:
(Latin 232)

History of the Latin Language:
(Latin 240)

Italic Dialects and Latin Historical Grammar:
(Latin 242A-242B)

Studies in Linguistics and Dialectology:
(Spanish 256A-256B)

Studies in the History of the Romance Languages:

Gallo-Romance:
(French 215A)

Hispano-Romance:
(Spanish M251)

Italo-Romance:
(Italian 259A-259B)

Courses in Literature

The Intellectual Background of Romance Literature:
(French 205A-205C)

Literary Criticism:
(French 203A-203B)
(Spanish M201)
(Italian 205A-205B)

Studies in the History of Ideas:
(French 260A-260B)

Studies in Literary Criticism:
(French 258A-258B)

Studies in Philosophy and Literature:
(French 259A-259B)

Early Romance Literature

Early Romance Literature:
(French 215B-215E)
(Spanish 222-223 and Portuguese 242A)
(Italian 210B-210C, 214-215)

Petrarca:
(Italian 214D)

Studies in Early Romance Literature:
(French 250A-250B)
(Spanish 262A-262B)
(Italian 250-252)

Renaissance and Baroque

Renaissance and Baroque Literature:

(French 216-217)
(Spanish 224-226 and 237, and
Portuguese 222)
(Italian 216-217)

Cervantes:

(Spanish 227)

Studies in Renaissance and Baroque

Literature:

(French 251-253)
(Spanish 264A-264B)
(Italian 253-255)

Modern

The XVIIIth Century:

(French 218A-218B-218D)
(Spanish 230 and 239)
(Italian 218A-218B)

Rousseau:

(French 218C)

The XIXth Century:

(French 219A-219B)
(Spanish 231 and Portuguese 242B and
243B)
(Italian 219A-219B)

The XXth Century:

(French 220-221)
(Spanish 232-235 and 240-245, and
Portuguese 235-236, 242C and 243C)
(Italian 220A-220C)

Studies in the XVIIIth Century:

(French 254A-254B)
(Spanish 277)
(Italian 256A-256B)

Studies in the XIXth Century:

(French 255A-255B)
(Spanish 270A-270B)
(Italian 257A-257B)

Studies in the XXth Century:

(French 256-257)
(Spanish 272 and 280)
(Italian 258A-258B)

■ SLAVIC LANGUAGES

(Department Office, 5288 Bunche Hall)

Henrik Birnbaum, Ph.D., *Professor of Slavic Languages.*

Thomas Eekman, Ph.D., *Professor of Slavic Languages.*

Marija Gimbutas, Ph.D., *Professor of European Archaeology.*

Kenneth E. Harper, Ph.D., *Professor of Slavic Languages (Chairman of the Department).*

Vladimir Markov, Ph.D., *Professor of Slavic Languages.*

Dean S. Worth, Ph.D., *Professor of Slavic Languages.*

Alexander Albin, Ph.D., *Associate Professor of Slavic Languages.*

Michael Shapiro, Ph.D., *Associate Professor of Slavic Languages.*

Michael S. Flier, Ph.D., *Assistant Professor of Slavic Languages.*

Peter Hodgson, Jr., Ph.D., *Assistant Professor of Slavic Languages.*



Edward Denzler, M.A., *Lecturer in Slavic Languages.*

Rochelle Stone, Ph.D., *Acting Assistant Professor of Slavic Languages.*

Ilya Talev, Ph.D., *Acting Assistant Professor of Slavic Languages.*

Alan H. Timberlake, B.A., *Acting Assistant Professor of 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; three courses chosen from Russian 130A-130B-130C, 140A-140B-140C-140D, 150; one course chosen from Russian 124A through 124F; and any three electives chosen from:

Russian 124A-124F, 130A-130B-130C, 140A-140D, 150, Polish 152A-152B, Czech 155A-155B, Serbocroatian 154A-154B.

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 148-149. 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 developments 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 151-154. The Departments' 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 substitute 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

99A-99B. Slavic Peoples and Cultures.

(Formerly numbered 99) Four hours weekly. A. Prehistoric period and migrations of the Slavs; early Slavic civilization; the South Slavs. B. The East Slavs; the West Slavs. Mr. Eekman

177. Baltic Languages and Cultures. (½ course)

Two hours weekly. A general survey of the peoples speaking Old Prussian, Lithuanian, and Latvian; their linguistic, historical and ethnic affiliations. Mrs. Gimbutas

M179. Introduction to Baltic and Slavic Folklore and Mythology.

(Same as Folklore M126). A general course for students interested in folklore and mythology and for those interested in Indo-European mythic antiquities. Mrs. Gimbutas

199. Special Studies.

No scheduled hours. Prerequisite: senior standing and consent of instructor. The Staff

Graduate Linguistic Courses

201. Introduction to Old Church Slavic.

Three hours weekly. Introduction to phonology and grammar; readings. Required for the M.A. (Linguistics) and Ph.D. (Linguistics, Literature).

202. Introduction to Comparative Slavic Linguistics.

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.

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).

223. Introduction to Southern Slavic Languages.

Three hours weekly. Prerequisite: course 202. Recommended preparation: Serbo-croatian 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.

Three hours weekly. Prerequisite: course 202. Introduction to the history and structure of Ukrainian and Belorussian as contrasted to Russian.

241A-241B. Advanced Old Church Slavic.

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). The Staff

242. Comparative Slavic Linguistics.

Three hours weekly. Prerequisite: course 202. Indo-European to Common Slavic and the development of Common Slavic. Required for the Ph.D. (Linguistics). The Staff

261. Slavic Paleography.

Three hours weekly. Prerequisite: course 201. Introduction to Slavic paleography: inscriptions, birchbark letters, Glagolitic and Cyrillic texts.

262A-262B. Western Slavic Linguistics.

Three hours weekly. Prerequisite: course 222.
262A. Lekhitic. 262B. Czechoslovak, Sorbian.
The Staff

263A-263B. Southern Slavic Linguistics.

Three hours weekly. Prerequisite: course 223.
263A. Serbocroatian and Slovene. 263B. Bulgarian
and Macedonian. Mr. Albin

281. Seminar in Slavic Linguistics.

Three hours weekly. Selected topics in comparative
and historical Slavic linguistics. May be repeated
for credit with consent of the instructor and grad-
uate adviser. The Staff

282. Seminar in Structural Analysis.

Three hours weekly. Selected topics. May be re-
peated for credit with consent of the instructor and
graduate adviser. The Staff

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. Eekman

290. Seminar in Comparative Slavic Literature.

Three hours weekly. Prerequisites: courses 230A-
230B-230C. Selected topics. May be repeated for
credit with consent of the instructor and the grad-
uate adviser. Mr. Eekman

295. Seminar in Literary Analysis.

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 labo-
ratory. 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

10A-10B-10C. Russian Conversation. (½ course each)

Three hours weekly. Prerequisite: Russian 3. A
supervised course in Russian conversation which
will give the students more exercise and encourage-
ment to put their knowledge of Russian into practice.
Knowledge acquired in the first and second year
of Russian will be applied; conversational practice
will be related to facts and rules of grammar and
phonetics. 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 vocabu-
lary building and writing fluency; reading and lin-
guistic *explication de texte* of largely non-fictional
material coordinated with English-Russian transla-
tion. Required for the M.A. (Linguistics, Literature).
Mr. Shapiro in charge

121. Russian Phonology.

Four hours weekly. Prerequisite: course 6. Intro-
duction to articulatory phonetics, phonemics, morpho-
phonemics. Mr. Flier, Mr. Shapiro, Mr. Worth

122. Russian Morphology.

Four hours weekly. Prerequisite: course 6. Intro-
duction to the flexional and derivational morpho-
logy of Russian. Mr. Flier, Mr. Shapiro, Mr. Worth

123. Historical Commentary to Modern Russian.

Four hours weekly. Prerequisite: course 6. His-
torical explanation of the phonological and morpho-
logical anomalies of modern Russian.
Mr. Flier, Mr. 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

M150. Russian Folk Literature.

Same as Folklore M150. Four hours weekly. 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. Shapiro

204. Introduction to the History of the Russian Literary Language.

Prerequisites: course 123, Slavic 99A-99B. Introductory survey of literary Russian in its cultural and historical setting. Required for the M.A. (Linguistics, Literature). The Staff

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. Flier, Mr. Worth

241. Russian Phonology.

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.

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)

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). The Staff

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.

Three hours weekly. Prerequisites: course 204, Slavic 201. Lectures and analysis of texts. Eleventh to twentieth centuries. The Staff

265. Russian Syntax.

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. 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). The Staff

Graduate Literature Courses**211. Eighteenth Century Russian Literature.**

Three hours weekly. Lectures and readings in major and secondary writers. Required for the M.A. (Literature). Mr. Hodgson, Mr. Markov

212. Nineteenth Century Russian Literature.

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.

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.

Three hours weekly. 251A. Kievan period. 251B. Feudal disintegration and Muscovite period. One quarter required for the Ph.D. (Literature). Mr. Flier, 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.

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.

Three hours weekly. Prerequisite: course 251. Mr. Flier, Mr. Worth

292. Seminar in Nineteenth Century Russian Literature.

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.

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.

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.

Five hours weekly. Basic course in the Polish language. The Staff

102D-102E-102F. Advanced Polish.

Four hours weekly. Prerequisite: course 102C. The Staff

152A-152B. Survey of Polish Literature.

Four hours weekly. Lectures and readings in English. 152A. From the Middle Ages to Romanticism. 152B. From Realism to the present. The Staff

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.

Five hours weekly. Basic course in the Czech language. The Staff

102D-102E-102F. Advanced Czech.

Four hours weekly. Prerequisite: course 102C. The Staff

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. The Staff

199. Special Studies.

No scheduled hours. Prerequisite: senior standing and consent of instructor. The Staff

Graduate Courses

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. 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

Serbo-croatian

103A-103B-103C. Elementary Serbo-croatian.

Five hours weekly. Basic course in the Serbo-croatian language. Mr. Albis

103D-103E-103F. Advanced Serbo-croatian.

Four hours weekly. Prerequisite: course 103C. Mr. Albis

154A-154B. Survey of Yugoslav Literature.

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. Albis, Mr. Eekman

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; Folklore M126, Linguistics 100, 110, 120, M150, 225C, as well as several of the graduate courses in Linguistics.

■ SOCIAL WELFARE

(Department Office, 238 Social Welfare Building)

Jerome Cohen, Ph.D., *Professor of Social Welfare.*

Nathan E. Cohen, Ph.D., *Professor of Social Welfare (Chairman of the Doctoral Program).*

Maurice F. Connery, D.S.W., *Professor of Social Welfare (Chairman).*

Alfred H. Katz, *Professor of Social Welfare and Professor of Public Health.*

Harry H. L. Kitano, Ph.D., *Professor of Social Welfare.*

Elliot T. Studt, D.S.W., *Professor of Social Welfare.*

Eileen Blackey, D.S.W., *Emeritus Professor of Social Welfare.*

Donald S. Howard, Ph.D., L.H.D., *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.*

Jeanne M. Giovannoni, Ph.D., *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.*

Robert Brockman, D.S.W., *Assistant Professor of Social Welfare.*

Harry Wasserman, D.S.W., *Assistant Professor of Social Welfare.*



Ester Bentley, M.S.W., *Field Work Consultant.*

Elsie Giorgi, M.D., *Lecturer in Human Behavior.*

Jane E. Kurohara, M.S.W., *Field Work Consultant.*

Doris S. Jacobson, Ph.D., *Lecturer in Social Welfare.*

Katherine M. Kolodziejski, M.S.W., *Field Work Consultant.*

Myra Koplin, M.S.W., *Field Work Consultant.*

Roderick Gorney, M.D., *Associate Clinical Professor of Psychiatry and Lecturer in Social Welfare.*

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.*

Winifred E. Smith, M.S.W., *Lecturer in and Coordinator of Field Instruction.*

Laura S. Wiltz, M.S., *Field Work Consultant.*

Jane Yearwood, M.S.W., *Field Work Consultant.*

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

of human functioning as those problems relate to the role and function of the social worker. Mr. J. Cohen, Mrs. Jacobson, 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

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

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**

210A-210B-210C. Social Ecology.

Prerequisite: Doctoral status and/or permission of the instructor. Exploration of data and theories from the biological and policy sciences regarding ecological relationships. Review of current biophysical, sociocultural, demographic, technological, economic, and political changes as they affect human society, its institutions and, more particularly, social welfare needs. **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 licens-

ing; professional responsibility for continued self-criticism and improvement of the profession. **The Staff**

224A-224B-224C. History and Philosophy of Social Welfare.

Prerequisite: Doctoral status and/or permission of the instructor. Analysis of long-term trends in welfare policies and programs in relation to political, economic, and other relevant factors. Philosophical foundations underlying social welfare theories, programs, and methods will be explored and values, assumptions, and attitudes historically affecting welfare examined. **The Staff**

225A-225B-225C. Social Welfare Systems.

Prerequisite: Doctoral status and/or permission of the instructor. Analysis of theories of organizational behavior affecting social welfare systems (including supranational systems transcending national boundaries), their directions, goals, values, and relationships to social work. Application of organizational theory to planning, organizing, and administering welfare agencies will be stressed. **The Staff**

227A-227B-227C. Comparative Social Welfare Theories and Programs.

Prerequisite: Doctoral status and/or permission of the instructor. Analysis of interrelationships between nations' welfare services and the social, economic, religious, and broader cultural milieus within which they develop. Special attention to social theories, value systems, and other elements of culture which particularly affect welfare programs. **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

245A-245B-245C. Development of Social Work Practice Theory.

Prerequisite: Doctoral status and/or permission of the instructor. Examination of social work theories of practice, assumptions incorporated within different practice approaches in different historical periods, and research methods to study practice. Current theory development will be assessed and paradigms for theory development research employed in student projects. The Staff

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

285A-285B-285C. Research in Social Welfare.

Prerequisite: Doctoral status and/or permission of the instructor. Review of areas of research of concern to social workers with special attention to design, instrument construction, data collection, data processing, data reduction, analysis and interpretation. Designs studied will include survey, panel, experimental observation, and theory development research. The 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. (1 ½ 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

596A. Special Study and Research for M.S.W. Degree Candidates. (½, 1 and 1 ½ courses)

Individual programming for selected students to permit pursuit of a subject in greater depth.

596B. Special Study and Research for D.S.W. Degree Candidates. (½ to 2 courses)

Prerequisite: Doctoral status and/or permission of the instructor. The Staff

597A. Preparation for the Comprehensive Examination for the M.S.W. Degree. (½ to 2 courses)

Prerequisite: consent of the instructor.

597B. Preparation for the Qualifying Examination for the D.S.W. Degree. (½ to 2 courses)

Prerequisite: Doctoral status and/or permission of the instructor. The Staff

599. Dissertation Research in Social Welfare for D.S.W. Degree Candidates. (½ to 2 courses)

Prerequisite: Doctoral status and/or permission of the instructor. The Staff

■ SOCIOLOGY

(Department Office, 264 Haines Hall)

Harold Garfinkel, Ph.D., *Professor of Sociology.*

Oscar Grusky, Ph.D., *Professor of Sociology (Chairman of the Department).*

Leo J. Kuper, Ph.D., *Professor of Sociology.*

Richard T. Morris, Ph.D., *Professor of Sociology.*

Georges Sabagh, Ph.D., *Professor of Sociology*

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.*

Melville Dalton, Ph.D., *Emeritus Professor of Sociology and Research Sociologist.*

Svend Riemer, Ph.D., *Emeritus Professor of 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*.
 Jerome Rabow, Ph.D., *Associate Professor of Sociology*.
 Samuel J. Surace, Ph.D., *Associate Professor of Sociology*.
 Warren D. TenHouten, Ph.D., *Associate Professor of Sociology*.
 Kenneth D. Bailey, Ph.D., *Assistant Professor of Sociology*.
 Phillip Bonacich, Ph.D., *Assistant Professor of Sociology*.
 John A. Davis, 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*.
 Samuel R. Friedman, Ph.D., *Assistant Professor of Sociology*.
 Lucie C. Hirata, Ph.D., *Assistant Professor of Sociology*.
 Ivan H. Light, Ph.D., *Assistant Professor of Sociology*.
 David E. Lopez, Ph.D., *Assistant Professor of Sociology*.
 George A. Miller, Ph.D., *Assistant Professor of Sociology*.
 Melvin Pollner, Ph.D., *Assistant Professor of Sociology*.
 Andrea Tyree, Ph.D., *Assistant Professor of Sociology*.



Ralph L. Beals, Ph.D., *Emeritus Professor of Anthropology and Sociology*.
 Walter R. Goldschmidt, Ph.D., *Professor of Anthropology and Sociology*.
 Michael S. Goldstein, Ph.D., *Assistant Professor of Public Health and Sociology*.
 C. Wayne Gordon, Ph.D., *Professor of Education and Sociology*.
 Harry H. L. Kitano, Ph.D., *Professor of Social Welfare and Sociology*.
 Valerie K. Oppenheimer, Ph.D., *Assistant Research Sociologist*.
 David O'Shea, Ph.D., *Assistant Professor of Education and Sociology*.
 Leo G. Reeder, Ph.D., *Professor of Public Health and Sociology*.
 Edwin S. Shneidman, Ph.D., *Professor of Medical Psychology and Sociology*.
 Gerald H. Shure, Ph.D., *Professor of Psychology and Sociology*.

Preparation for the Major

Required: courses 1 and fulfillment of the general requirements of the University and the College of Letters and Science. Substitutions for Sociology 18 are: Mathematics 50, Economics 140, Psychology 41, or Public Health 160A. 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. Recommended: Sociology 109, 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. Students may apply to the Department for counseling or advising.

The Major

A total of 14 upper division courses, ten in the Department and four outside, are

required for the major. Two of 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. A psychology course taken to fulfill the major requirement will not count toward the breadth requirement. None of the 14 courses may be taken on a pass/not pass basis. Courses 109, 110A, and 110B are strongly recommended for students who intend to pursue graduate study in sociology.

Social 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 satisfy the faculty that he has an adequate command of sociological theory, methodology, and substance by submission of an acceptable dossier of written papers, as prescribed in departmental regulations. 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) satisfy the faculty that he has an adequate command of sociological theory, methodology, and substance by submission of an acceptable dossier of written papers, as prescribed in departmental regulations; (5) pass written examinations in two special fields; (6) pass a qualifying oral examination; (7) prepare a satisfactory doc-

toral dissertation embodying the results of original research; (8) at the option of the certifying members of the candidate's doctoral committee, a final oral examination may be deemed necessary. Details of these requirements are described in a syllabus which may be secured from the office of the Department.

The dissertation 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.

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

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. TenHouten, Miss Tyree

Upper Division Courses

Course 1, 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

109. Introduction to Sociological Research Methods.

(Formerly numbered 19) 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 materials.

Mr. Bailey, Mr. TenHouten

110A. Intermediate Quantitative Methods I.

Prerequisites: 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. Bailey, Mr. Bonach, Mr. TenHouten

110B. Intermediate Quantitative Methods II.

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. Bailey, Mr. Bonasich, Mr. TenHouten

111. Backgrounds of Sociological Thought.

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. The Staff

112. Development of Sociological Theory.

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.

A critical examination of significant theoretical formulations, 1920 to the present; an analysis of the relation between theoretical development and current research emphasis.

Mr. Gardinkel, Mrs. Hirata, Mr. Morris

CORE AREA II: SOCIAL STRUCTURE AND CHANGE

120. Social Change.

A study of patterns of social change, resistance to change, and change-producing agencies and processes. Mr. Friedman, Mr. Surace

121. Formal Organizations.

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.

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. Mr. Levine

123. Social Stratification.

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.

Mr. Lopez, Miss Tyree

124. Ethnic and Status Groups.

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, Mrs. Hirata

125. Urban Sociology.

Urban and rural cultures, the characteristics of cities in Western civilization, with emphasis on the American metropolis. Mr. Light, Mr. Orleans

126. Social Demography.

Studies of past, present, and future trends in population growth. Sociological theories of causes

and consequences of population growth and redistribution. Emphases on the correlates of fertility, mortality, and migration.

Mr. Bailey, Mr. Sabagh, Miss Tyree

128. Occupations and Professions.

Description and analysis of representative occupations and professions, with emphasis upon the contemporary United States. Mr. Light Mr. Miller

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.

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.

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. Lopez

132. Population and Society in the Middle East.

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

134. Comparative Social Institutions of East Asia.

Analysis of selected social institutions of China, Japan, and Korea. Emphasis will be on continuity and change in East Asian societies. Mrs. Hirata

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.

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. Kuper, Mr. Surace

141. Industry and Society.

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. Light, Mr. Miller

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. Morris

M143. Sociology of Education.

(Same as Education M108.) 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.

Prerequisite: course 125. Implications for family and urban social relationships of housing floor plans and plans for neighborhoods and cities.

145. Sociology of Deviant Behavior.

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. Emerson, Mr. Horton, Mr. Rabow

148. Criminology.

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.

Theories of punishment; methods of dealing with convicts; social organization of police, courts, prisons, probation, and parole.

Mr. Rabow

148. Normal Environments.

Structural interpretation of the concerted production, management, and alteration of preceivedly normal interpersonal environments.

Mr. Garfinkel, Mr. Pollner

149. A Study of Norms.

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.

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.

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.

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

153. Process and Socialization in the Family.

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.

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. Rabow

155. Intergroup Conflict and Prejudices.

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. Seeman

156. Simulation of Social Processes.

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. Rabow

157. Sociology of Mental Illness.

Sociological approaches to the definition, identification and treatment of the mentally ill. Distinguishing between the criminal and the insane. Worlds of the mentally ill. Insanity as a social phenomenon.

Mr. Emerson, Mr. Pollner

M158. Death and Suicide: Psychological and Sociological Aspects.

(Same as Psychology M163.) The definition and taxonomy of death; the new permissiveness and taboos relating to death; the romanticization of death; the role of the individual in his own demise; the modes of death; development of ideas of death through the life span; ways in which ideas of death influence the conduct of lives; the impact of dying on the social structure surrounding the individual; preventive, interventive and postventive practices in relation to death and suicide; partial death; megadeath; lethality; the psychological autopsy; the death of institutions and cultures.

Mr. Shneidman

CORE AREA VI: SOCIAL POLICY AND APPLIED SOCIOLOGY

Advanced Studies

191-196. Undergraduate Seminars.

Prerequisites: upper division standing, major in

Sociology, and permission of the instructor. These courses are listed under each of six core areas, with 191 in Core Area I, 192 in Core Area II, etc.

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. 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

216A–216B. Survey Research Methods.

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 ethical 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. Rabow, Mr. Seeman

226. Leadership and Comparative Social Structure.

A comparative analysis of leadership in different social structures with particular attention to the development, maintenance, and disintegration of leadership corps and cadres.

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. Emerson, Mr. Rabow

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 movements and upheavals. The causes, course and consequences of selected social movements, insurrections and revolutions will be examined.

Mr. Friedman, 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

M245. Urban Morphology: Definitions and Consequences.

(Same as Architecture and Urban Planning M255.) 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, Mr. Stea

M249A. Sociocultural Aspects of Health and Illness.

(Same as Public Health M249A.) Prerequisite: Public Health 149 or graduate standing in sociology, anthropology or psychology, and consent of the instructor. The relationship between the sociological, cultural, and psychosocial factors in the etiology occurrence, and distribution of morbidity and mortality. Emphasis is on life styles and other socioenvironmental factors associated with disease and mortality. Mr. Reeder and the Staff

M249B. Sociocultural Aspects of Health and Illness.

(Same as Public Health M249B.) Prerequisites: course M249A or consent of the instructor. Sociological, cultural, and psychosocial factors in health and illness behavior. Emphasis is on the relationship of these factors to definitions of illness, health care behavior, and professional-client relationships. Mr. Reeder and the Staff

Seminars

250. Methodological Problems.

Mr. Bailey, Mr. Boyle, Mr. Seeman

251. Topics in the Problems of Social Order.

Mr. Garfinkel

252. Criminology.

Mr. Davis, Mr. Rabow

253. Quantitative Methods in Sociology.

Mr. Bailey, Mr. Bonacich, Mr. Levine

254A-254B. Sociology of Law.

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. Kuper

256. Demography.

Mr. Bailey, Mr. Sabagh, Miss Tyree

257. Sociology of the Arts.

Mr. Horton

258. Sociology of Religion. Mr. Elinson, Mr. Kuper

259. Social Structure and Economic Change: Historical and Comparative Perspectives.

Mr. Surace

260. Industry and Society.

Mr. Light

261. Ethnic Minorities.

Mr. Davis, Mr. Seeman

262. Selected Problems in Urban Sociology.

Mr. Orleans

263. Social Stratification.

Miss Tyree

264. Professions in the American Society.

265. Problems in Organization Theory. Mr. Grusky

267. Selected Problems in Communication.

268. Historical and Interpretive Sociology.

269. Collective Behavior.

Mr. Turner

270. Selected Problems in Socialization. Mr. Turner

271. Ethnomethodology.

Mr. Garfinkel

272. Topics in Political Sociology.

Mr. Elinson, Mr. Farber, Mr. Kuper

273. Attitudes and Social Structure.

Mr. Seeman

274. Selected Problems in the Sociology of Africa.

Prerequisite: graduate standing and consent of the instructor. Selection of problems in the sociology of Africa from among the following fields: urbanization, racial and ethnic relations, national integration, and political change. Mr. Kuper

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

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

495. Supervised Teaching of Sociology.

Prerequisites: Teaching Assistant status in the Department of Sociology, or equivalent. A special course for teaching assistants. It is designed to deal with the problems and techniques of teaching introductory sociology.

The Staff

Individual Study and Research

596. Special Problems in Sociology.

(½ to 2 courses)

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. (1 to 2 courses)

The Staff

599. Research in Sociology for Ph.D. Degree

Candidates. (1 to 2 courses)

The Staff

■ SPANISH AND PORTUGUESE

(Department Office, 5303 Rolfe Hall)

José R. Barcia, Lic. F. y L., *Professor of Spanish.*

Rubén Angel Benítez, Ph.D., *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).*

Claude L. Hulet, Ph.D., *Professor of Spanish and Portuguese.*

C. P. Otero, Ph.D., *Professor of Spanish and Romance Linguistics.*

Julio Rodríguez-Puértolas, Ph.D., *Professor of Spanish.*

Stanley L. Robe, Ph.D., *Professor of Spanish.*

Alberto Machado da Roca, Ph.D., *Professor of Spanish and Portuguese.*

Aníbal Sánchez-Reulet, Ph.D., *Professor of Spanish (Vice Chairman of the Department).*

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.*

Shirley L. Arora, Ph.D., *Associate Professor of Spanish.*

Enrique Rodríguez-Cepeda, Ph.D., *Associate Professor of Spanish.*

Carroll B. Johnson, Ph.D., *Assistant Professor of Spanish.*

Gerardo Luzuriaga, Ph.D., *Assistant Professor of Spanish.*

Richard M. Reeve, Ph.D., *Assistant Professor of Spanish.*

Robert S. Rudder, Ph.D., *Assistant Professor of Spanish.*

Paul Smith, Ph.D., *Assistant Professor of Spanish.*

María L. de Lowther, M.A., *Assistant Professor of Spanish, Emeritus.*

Frederick Williams, Ph.D., *Assistant Professor of Spanish.*

———, *Assistant Professor of Spanish.*



José Ramón Araluce, Ph.D., *Visiting Lecturer in Spanish.*

Paulo de Carvalho-Neto, Lic. C.S., *Lecturer in Spanish and Portuguese.*

Alfonso Cervantes, M.A., *Acting Assistant Professor of Spanish.*

Enrique G. Cortés, M.A., *Lecturer in Spanish.*

E. Mayone Dias, Lic. F.G., *Lecturer in Spanish and Portuguese.*

Isabel L. Herwig, M.A., *Lecturer in Spanish and Portuguese.*

Antonio Loera, M.A., *Acting Assistant Professor of Spanish.*

Josefina M. Méndez, Ed.D., *Lecturer in Spanish.*

José M. Cruz Salvadores, M.A., *Lecturer in Spanish.*

George L. Voyt, J.D., *Lecturer in Spanish.*

Spanish

Preparation for the Major

Courses 5, 25, M42, and M44, or their equivalents.

The Major

Fifteen upper division courses distributed as follows: eight required courses: 100 or 103, 105 or 109, 115 or M118, 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 148-149. The Department favors the Comprehensive Examination Plan, but, with departmental approval, the Thesis Plan may be followed. See page 150.

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 151-154.

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) Portuguese Literature; (h) Brazilian Literature; (i) Spanish and Portuguese Philology and Linguistics; (j) 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 251-286) or the equivalent.

Course Requirements. Three upper division courses in Portuguese or 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 candidate'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. At the time of the qualifying examination, or subsequently, the committee may specify whether or not an oral examination is required after the acceptance of the dissertation in its final form.

The Dissertation. The dissertation may be on any subject within the general area of Spanish and Portuguese languages and literatures. 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 five hours weekly; laboratory one hour. This course corresponds to the first year of high school Spanish. The Staff

1G. Reading Course for Graduate Students.

(No credit)

Meets five hours weekly.

The Staff

2. Elementary Spanish.

Meets five hours weekly; laboratory one hour. Prerequisite: course 1 or one year of high school Spanish, or equivalent. The Staff

2G. Reading Course for Graduate Students.

(No credit)

Meets five hours weekly. Prerequisite: course 1G or equivalent. The Staff

3. Elementary Spanish.

Meets five hours weekly; laboratory one hour. Prerequisite: course 2, or two years of high school Spanish, or equivalent. The Staff

4. Intermediate Spanish.

Meets five hours weekly; laboratory one hour. Prerequisite: course 3, or three years of high school Spanish, or equivalent. The Staff

5. Intermediate Spanish.

Meets five hours weekly; laboratory one hour. 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

M42. Civilization of Spain and Portugal.

(Same as Portuguese M42.) A background course for the study of Peninsular literature.

Mr. Cruz-Salvadores

M44. Civilization of Spanish America and Brazil.

(Same as Portuguese M44.) 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. Phonology and Pronunciation.

(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. Interrelation of phonological and morphological phenomena. Exercises and drills directed toward individual needs.

Mr. Cruz-Salvadores, Mr. Otero

103. Syntax.

(Formerly numbered 100.) A study of sentence types and their variations. The lexicon and its features. Interrelation of syntactic, semantic and morphological phenomena.

Mr. Otero

105. Intermediate Composition.

(Formerly numbered 101.) Paraphrasing, summarizing, and study of idiomatic expressions.

Mr. Voyt

109. Advanced Composition.

(Formerly numbered 114.) Correction of student's original compositions and analysis of basic stylistic elements.

Mr. Cortés

115. Applied Linguistics.

Meets three hours weekly. Survey of the major linguistic problems faced by the teacher of Spanish.

M118. History of the Portuguese and Spanish Languages.

(Same as Portuguese M118.) Meets three hours weekly. Major features of the development of the Portuguese and Spanish languages from the origins in Vulgar Latin to modern times. Contributions of other languages to the formation of Portuguese and Spanish.

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. 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. Loera

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

141. Mexican Literature.

Meets three hours weekly, including one hour discussion. A study of the main writers and literary genres of Mexico from colonial times to the present, with emphasis on the 20th Century.

Mr. Loera, Mr. Cervantes

143. Spanish American Literature in the 20th Century.

A detailed study of the important writers and movements since 1880.

Mr. Crow

145. Spanish and American Drama.

Prerequisites: Spanish 121A and 121B. A survey of dramatic literature from colonial times to the present, with emphasis on the twentieth century.

Mr. Luzuriaga

147. Literary Analysis.

An introduction to the study of literary devices, figures of speech and the differentiation of literary genres.

Mr. Benítez, Mr. Otero

M149. Folk Literature of the Hispanic World.

(Same as Folklore M149.) 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 Quixote* and other major works by Cervantes.

Mr. Johnson

170A. Honors 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. Honors 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**M200. Bibliography.**

(Same as Portuguese M200.) (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

M201. Literary Criticism.

(Same as Portuguese M201.) (Formerly numbered 201B.) Meets three hours weekly. Definition and discussion of methods of literary criticism.

Mr. Benítez, Mr. Otero, Mr. Machado da Rosa

M203A-203B. The Development of the Portuguese and Spanish Languages.

(Same as Portuguese M203A-M203B.) 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

204A-204B. Transformational Grammar.

Meets three hours weekly. Prerequisite: course 204A is prerequisite to 204B, or consent of the instructor. A transformational approach to the Spanish language, with some consideration of the bearing of syntax, semology, and phonology on style, metaphor and meter.

Mr. Otero

209. 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. Rodríguez-Puértolas

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. Rodríguez-Cepeda

230. Neoclassicism and Romanticism.

Meets three hours weekly. Readings and lectures on representative works of 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 1890-1916. 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

M249. Hispanic Folk Literature.

(Same as Folklore M249 and Portuguese M249.) 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**M251. Studies in Galegan-Portuguese and Old Spanish.**

(Formerly numbered 253 and same as Portuguese M251.) Prerequisite: course 203. Problems related to the historical development of Galegan-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. Rodríguez-Puértolas

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. Studies in Prose of the Golden Age. Meets two hours weekly. Prerequisite: course 226. Mr. Rodríguez-Puértolas

264D. Don Quijote. Meets two hours weekly. Prerequisite: course 227. Mr. Rodríguez-Puértolas

270A-270B. Studies in 18th and 19th Century Spanish Literature.

270A. Poetry, Drama and Prose. Meets two hours weekly. Prerequisite: course 230. Mr. Benítez

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, Mr. Fogelquist

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

M286A-286B-286C. Studies in Hispanic Folk Literature.

(Same as Folklore M286A-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. Bull

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

M495. Teaching Methodology.

(Same as Portuguese M495.) Meets three hours weekly. Prerequisite: graduate standing. A critical analysis of currently used elementary texts aimed at developing a practical and eclectic teaching methodology. Preparation for teaching at the college and university level. Mr. Bull

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 examination 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 se-

lected 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.

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.

Requirement for Teaching Credentials. Consult the UCLA announcement of the Graduate School of Education.

The Master's Degree

General Requirements. See pages 148-149. The Department favors the Comprehensive Examination Plan, but, with departmental approval, the Thesis Plan may be followed. See page 150.

Departmental Requirements—Comprehensive Examination Plan. (1) Foreign Language Requirements: a reading knowledge of one other foreign language approved by the graduate adviser. Spanish is acceptable. This requirement must be met at least one quarter before the awarding of the degree. (2) Course Requirements: Nine upper division and graduate level courses of which a minimum of six will be graduate courses in the 200 series, including one seminar; two graduate courses in closely related fields may be taken with the approval of the graduate adviser; a maximum of three upper division courses, excluding those required or elective courses in the preparation of the major, may be taken. (3) The examination will be divided into three major parts. In the first, the student will be expected to show a general knowledge of the history and structure of the Portuguese language. In the second and third parts, the student will be expected to show a thorough acquaintance with the authors, works, and movements of both Portuguese and Brazilian literature. Reading lists which will constitute the basis for the second and third examinations will be available to the student. Only those students who pass these examinations with distinction will be encouraged to proceed to the 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 mem-

bers 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 such 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 for the Comprehensive Examination Plan. (3) Course Requirements: same as for the Comprehensive Examination Plan, except that the student will be required to enroll in Portuguese 598, Research on Master's Thesis, which will count as one of the nine required courses. (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 151-154.

Lower Division Courses

1. Elementary Portuguese.

Meets five hours weekly; laboratory one hour.
The Staff

2. Elementary Portuguese.

Meets five hours weekly; laboratory one hour.
Prerequisite: Course 1 or equivalent. The Staff

3. Intermediate Portuguese.

Meets five hours weekly; laboratory one hour.
Prerequisite: Course 2 or equivalent. The Staff

8A-8B. Portuguese Conversation. (½ course each)

Meets three discussion hours weekly. Prerequisite: open to students who have completed Portuguese 3 with Grade B or better. The Staff

25. Advanced Portuguese.

Meets four hours weekly. Prerequisite: Course 3 or equivalent. The Staff

M42. Civilization of Spain and Portugal.

(Same as Spanish M42.) A background course for the study of Peninsular literature.

Mr. Cruz-Salvadores

M44. Civilization of Spanish America and Brazil.

(Same as Spanish M44.) A background course for the study of Spanish American and Brazilian literatures.

Mrs. Arora

Upper Division Courses

100. Phonology and Pronunciation.

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. 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

M118. History of the Portuguese and Spanish Languages.

(Same as Spanish M118.) Meets three hours weekly. Major features of the development of the Portuguese and Spanish languages from their origins in Vulgar Latin to modern times. Contributions of other languages to the formation of Portuguese and Spanish.

Mr. Dias, Mr. Otero, Mr. Smith

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

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 da Rosa

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

124. Medieval Portuguese Literature.

The main genres of Medieval Portuguese and Galician literature with emphasis on at least one representative work for each.

Mr. Dias

126. Renaissance and Baroque Portuguese Literature.

The main genres of Renaissance and Baroque literature with emphasis on at least one representative work for each.

Mr. Dias

127. Colonial Brazilian Literature.

A study of the most important authors and literary current to 1830. Mr. Hulet

128. 18th and 19th Century Portuguese Literature.

The main manifestations of thought and literature from 1700 to 1900 with emphasis on representative works. Mr. Dias

129. Romanticism in Brazil.

A study of representative trends and authors. Mr. Hulet

135. Naturalism, Realism and Parnasianism in Brazil.

A study of representative trends and authors. Mr. Hulet

136. Contemporary Portuguese Literature.

A study of representative trends and authors. Mr. Dias

137. Contemporary Brazilian Literature.

A study of representative trends and authors. 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**M200. Bibliography.**

(Same as Spanish M200.) Meets three hours weekly. Identification and analysis of bibliographical sources for work by doctoral candidates in their fields of specialization.

Mr. Benitez, Mr. Rodriguez-Puertolas

M201. Literary Criticism.

(Same as Spanish M201.) Meets three hours weekly. Definition and discussion of methods of literary criticism.

Mr. Benitez, Mr. Otero, Mr. Machado da Rosa

M203A-203B. The Development of the Portuguese and Spanish Languages.

(Same as Spanish M203A-M203B.) Prerequisite: course 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

242A. Medieval and Renaissance Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Portuguese Literature. Mr. Machado da Rosa

242B. 18th and 19th Century Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Portuguese Literature. Mr. Machado da Rosa

242C. 20th Century Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Portuguese Literature. Mr. Machado da Rosa

243A. Colonial Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Brazilian Literature. Mr. Hulet

243B. 19th Century Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Brazilian Literature. Mr. Hulet

243C. 20th Century Literature.

Meets two hours weekly. Prerequisite: consent of the instructor. Special topics in Brazilian Literature. Mr. Hulet

M249. Hispanic Folk Literature.

(Same as Folklore and Spanish M249.) 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

M251. Studies in Galagan-Portuguese and Old Spanish.

(Same as Spanish M251.) Prerequisite: course 203. Problems related to the historical development of Galagan-Portuguese and old Spanish. Mr. Otero

252A. Special Studies in Portuguese Literature:**The Novel.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Machado da Rosa

252B. Special Studies in Portuguese Literature:**The Poetry.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Machado da Rosa

252C. Special Studies in Portuguese Literature:**The Theater.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Machado da Rosa

252D. Special Studies in Portuguese Literature:**The Short Story and Essay.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Machado da Rosa

253A. Special Studies in Brazilian Literature:**The Novel.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Hulet

253B. Special Studies in Brazilian Literature:**The Poetry.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Hulet

253C. Special Studies in Brazilian Literature:**The Theater.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Hulet

253D. Special Studies in Brazilian Literature:**The Short Story and Essay.**

Meets two hours weekly. Prerequisite: consent of instructor. Mr. Hulet

370. The Teaching of Portuguese in the Secondary School.

For future teachers in this field. Mr. Hulet

M495. Teaching Methodology.

(Same as Spanish M495.) Meets three hours weekly. Prerequisite: graduate standing. A critical analysis of currently used elementary texts aimed at developing a practical and eclectic teaching methodology. Preparation for teaching at the college and university level. Mr. Bull

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

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

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

■ SPEECH*

(Department Office, 232 Royce Hall)

Charles Wyatt Lomas, Ph.D., *Professor of Speech (Chairman of the Department).*

Waldo Woodson Phelps, Ph.D., *Professor of Speech.*

Harrison Manly Karr, Ph.D., *Emeritus Professor of Speech.*

Donald Erwin Hargis, Ph.D., *Associate Professor of Speech.*

Ralph Richardson, Ph.D., *Associate Professor of Speech.*

Paul Irwin Rosenthal, Ph.D., *Associate Professor of Speech.*

Arthur Lee Smith, Ph.D., *Associate Professor of Communication Studies.*

Daniel Vandraegen, Ph.D., *Associate Professor of Speech.*

Dale Gordon Leathers, Ph.D., *Assistant Professor of Speech.*

Ned Alan Shearer, Ph.D., *Assistant Professor of Speech.*

Andrea Louise Rich, Ph.D., *Assistant Professor of Speech.*



Patricia Bellamy Long, M.A., *Lecturer in Speech.*

*The Department of Speech is in the process of being phased out in its present form. A Committee is engaged in a study to determine what courses and programs in the study of communication will be retained or established. Students now enrolled will be permitted to finish the programs under which they began.

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 signifi-

cance 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, 192.

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, 192.

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, 112.

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, 112, 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 selected from 197 or any specialized course in the sequences numbered from 140 to 179. 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 requisite, 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 148-149. The Department follows the Comprehensive Examination Plan, as described on page 150.

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, 112, (b) Speech 200, Speech 201, one course from the following group: 202, 206, 207, and two courses from the following group: 234, 235, 236, 237, 238, 239, 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

No new students are now being admitted to the Ph.D. Program in speech. Those already enrolled in the program will complete it according to the stated requirements.

For the general Graduate Division requirements, see pages 151-154.

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. Vandaegeen

112. 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

113. Readers Theater.

The concepts and practices of the oral interpretation of non-dramatic literature within the framework of the readers theater. Lectures, readings, reports, and performance practice.

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.

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

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

137A-137B. American Public Address.

Critical study of speeches by leading American orators. Relationships of speakers to issues and social movements of their day.

137A. Colonial period to 1865; 137B. 1865-1930.

Mr. Lomas, 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

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.

The Staff

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

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

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)

Intensive study of selected political or social issues; preparation of bibliography; analysis and evaluation of issues and arguments. May be repeated once for credit.

Mrs. Long

197. Proseminar 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. Mr. 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

221. Rhetorical Communication in World Cultures.

Comparative analysis of the theory and practice of rhetorical communication in African, Eastern, and Western cultures. Explorations of research methodologies consonant to each culture. Mr. Smith

234. Classical Rhetorical Theory.

The Staff

235. Medieval Rhetorical Theory.

The Staff

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, Mr. Vandraegen

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. Mr. Lomas

243. Homiletics.

An inquiry into the various expressions of religious discourse, both contemporary and traditional. Materials include sermons, dialogs, and homilies, as well as related poems and songs. Themes, forms, styles, and audiences are studied. The Staff

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

250. Seminar in Poetic and Rhetoric.

Mr. Hargis

■ 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.

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. Shearer

270A. Field Studies of Speech and Community Action.

Mr. Richardson

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

270B. Field Studies in Interracial Communication.

Mrs. Rich, Mr. Smith

Professional Course in Methods

370. The Teaching of Speech in the Secondary School.

Required of candidates for the general secondary credential with the major or minor in speech.

Mr. Phelps, Mrs. Rich

490. Exposition for College Teaching.

The nature of oral communication, its theory and application; preparation and delivery of information; observation and critical evaluation of oral communication experiences. Closed circuit television for various communication projects. Mr. Phelps

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

Anthropology

Course in statistical methods.

Biostatistics

Stochastic models in biology.

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.

Management

Master of Science and Ph.D. degree programs with specialization in business statistics offered by the Quantitative Methods Division.

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

Introductory and advanced courses in biostatistics. A Master of Science and Ph.D. degree in Biostatistics is given by the Biostatistics Division.

Sociology

Offerings in statistics, measurement, demography.

■ SUBJECT A: ENGLISH COMPOSITION

(Department Office, 306 Royce Hall)

———, *Professor of English.*

Everett L. Jones, M.A., *Supervisor of Instruction in Subject A.*

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 41 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 (Chairman of the Department).*

Arthur B. Friedman, Ph.D., *Professor of Theater Arts.*

Henry Goodman, Ph.D., *Professor of Theater Arts.*

Richard C. Hawkins, M.A., *Professor of Theater Arts.*

Edward Hearn, M.A., *Professor of Theater Arts.*

Melvyn B. Helstien, Ph.D., *Professor of Theater Arts (Vice Chairman: Theater).*

John H. Jones, M.A., *Professor of Theater Arts.*

Walter K. Kingson, Ed.D., *Professor of Theater Arts.*

Abe V. Wollock, Ph.D., *Professor of Theater Arts.*

John W. Young, M.S., *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.*

George M. Savage, 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.*
 John R. Cauble, M.A., *Associate Professor of Theater Arts.*
 Robert F. Corrigan, M.A., *Associate Professor of Theater Arts.*
 Donald B. Crabs, M.A., *Associate Professor of Theater Arts.*
 Robert H. Hethmon, Ph.D., *Associate Professor of Theater Arts.*
 James Kerans, Ph.D., *Associate Professor of Theater Arts.*
 Frank D. LaTourette, M.Litt., *Associate Professor of Theater Arts.*
 William H. Menger, M.A., *Associate Professor of Theater Arts (Vice Chairman: Motion Picture/Television).*
 Darrell E. Ross, M.F.A., *Associate Professor of Theater Arts.*
 Louis C. Stoumen, B.A., *Associate Professor of Theater Arts.*
 Mark McCarty, 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.*



- Theodore Apstein, Ph.D., *Lecturer in Theater Arts.*
 Orville L. Ballard, B.A., *Lecturer in Theater Arts.*
 John D. Boehm, M.A., *Lecturer in Theater Arts.*
 David S. Bradley, B.A., *Lecturer in Theater Arts.*
 Edgar Brokaw, B.A., *Lecturer in Theater Arts.*
 Gordon Davidson, M.A., *Lecturer in Theater Arts.*
 Doerte E. Egilsson, B.S., *Lecturer in Theater Arts.*
 Robert F. Epstein, *Lecturer in Theater Arts.*
 David L. Fagen, Ph.D., *Lecturer in Theater Arts.*
 Hiram L. Ferguson, M.A., *Lecturer in Theater Arts.*
 William Froug, B.J., *Lecturer in Theater Arts.*
 Alex Funke, B.A., *Lecturer in Theater Arts.*
 David Garcia, B.A., *Lecturer in Theater Arts.*
 Michael Gordon, M.F.A., *Lecturer in Theater Arts.*
 Hugh Grauel, M.A., *Lecturer in Theater Arts.*
 John Ingle, M.A., *Lecturer in Theater Arts.*
 Ruth C. Lane, *Lecturer in Theater Arts.*
 Lance W. Lee, M.F.A., *Lecturer in Theater Arts.*
 Robert E. Lee, D.Litt., *Lecturer in Theater Arts.*
 Howard E. Lester, M.F.A., *Lecturer in Theater Arts.*
 Dan F. McLaughlin, M.A., *Lecturer in Theater Arts.*
 Flora C. Mock, M.A., *Lecturer in Theater Arts.*
 Maidie R. Norman, B.A., *Lecturer in Theater Arts.*
 Delia N. Salvi, Ph.D., *Lecturer in Theater Arts.*
 J. Palmer Schoppe, *Lecturer in Theater Arts.*
 Ruth E. Schwartz, Ph.D., *Lecturer in Theater Arts.*
 Lyne S. Trimble, M.S., *Lecturer in Theater Arts.*
 William D. Ward, M.F.A., *Lecturer in Theater Arts.*
 ———, *Lecturer in Theater Arts.*
 ———, *Lecturer in Theater Arts.*
 ———, *Lecturer in Theater Arts.*
 ———, *Lecturer in Theater Arts.*

The Department of Theater Arts bases its work in theater, motion pictures, and television 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 92-97), and the requirements under one of the three specializations: theater, secondary teaching credential, motion picture-television.

Preparation for the Major

Theater Specialization. Courses 5A-5B, 10 and 20A.

Secondary Teaching Credential Specialization. Courses 5A, 5B, 10 and 20A.

Motion Picture/Television Specialization. Courses 5B and 5C. Students electing to specialize in motion picture/television 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, 160A, 170, 172A, 172B, 172C, 172D; four units chosen from 122, 143A, 144, 146B, 149A, 190A; and 28 units of approved upper division Theater Arts electives, to bring the total to 68 units. Through certain required courses listed above, all students during each quarter of residence are responsible for completing specific production assignments related to production activity of the Theater curriculum.

Special Programs in Theater. In addition to the standard major, the Theater curriculum 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 one-year program beginning in the senior year. Courses 105, 130A, 140A, 141A, 142A, 160A, 170, 172A, 172B, 120A, 121A, 121B, 121C, 121D, 121E, 121F; four units chosen from 122, 143A, 144, 146B, 149A, 190A; and four units of approved upper division Theater Arts electives, to bring the total to 68 units.

Special Program in Playwriting. Courses 105, 130A, 140A, 141A, 142A, 160A, 170,

172A, 172B; one course (4 units) chosen from 122, 143A, 144, 146B, 149A, 190A; three double courses: 130B, 130C and 130D; and 4 units of approved upper division Theater Arts electives to bring the total to 68 units.

Special Program in Design/Technical. Courses totaling 68 units to be arranged with adviser and subject to approval by the Vice Chairman, Theater.

Admission to any of the special programs in Theater is by application to the Vice Chairman, Theater, 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, 160A, 170, 172A, 172B, 172C, 172D; four units chosen from 122, 143A, 144, 146B, 149A, 190A; and 28 units of approved upper division Theater Arts electives, to bring the total to 68 units. 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 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 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 picture/television 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. Course 185, 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.

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 Curriculum 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

The Department of Theater Arts accepts students into the Graduate Program in the Fall Quarter only.

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 in-

formation should be obtained from the Graduate Secretary 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 motion pictures must complete the requirement of one foreign language before advancement to candidacy. There is no language requirement in television or theater. 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 or theater (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 171A or 171B, 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/Television. A minimum of nine courses (36 units), five of which must be from the following: 200, 206A, 206C, 208A, 209A, 209B, 210, 247, 270 and 288.

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. (See below for requirements by subject area.) In addition to formal courses 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.

lent. Candidates for the M.F.A. programs in theater or motion picture/television 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, technical supervision, puppetry or management, and a candidate must arrange with his adviser a program of a minimum of 16 courses which involve him in the successful completion of required work and his project series. A handbook of regulations for the M.F.A. in the theater may be obtained from the graduate secretary of the Department.

Motion Pictures/Television. The M.F.A. in motion pictures or television can be taken in either film making, television production or writing. There is a minimum residence of two years. A program of about 18 courses must 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. **Television Production.** Students will be admitted to the M.F.A. Program only after completing three quarters of graduate residency and qualifying for admittance by written application and approval of faculty. The base of this program is the B.A. in television at UCLA or its equivalent (see undergraduate programs above), and courses 179A, 185, and 186A-186B-186C. 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.

3. **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, a one-hour television script, or an equivalent amount of writing, in fictional or documentary forms.

In addition to the film making, television production, and writing specializations, there are other programs available to the student seeking the M.F.A. degree. Entrance into these programs requires faculty approval.

1. **Ethnographic Film:** This program begins in the Fall Quarter with a faculty-student seminar in ethnographic film, after which students are selected for intensive training. Students chosen for the program undergo instruction in other departments—for example, in Anthropology, Ethnomusicology, or Ethnic Dance. Enrollment in the Fall seminar is open to all graduate students, with special attention paid to those from Motion Pictures, Television, Anthropology, Sociology, Dance and Music.

2. **Broadcast Journalism:** Students accepted into this specialization are required to enroll in 480A-480B-480C in addition to other courses required in the M.F.A. production program.

3. **Educational Television:** This program is conducted in cooperation with the UCLA School of Education. Required courses are 288, 488A-488B-488C and three selected courses in the School of Education.

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. Mr. Mueller

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. The history of the influence of different cultures, traditions, and technologies on the development of theater as a social institution. Mr. Mueller

5C. History of Motion Pictures and Broadcasting.

Lecture, four hours; laboratory, two hours. Required of theater arts majors in the motion picture/television specialization. The history of the development of motion pictures and broadcasting from their beginnings to the present day. Mr. Stoumen

5D. Theater of the Non-European World.

Lecture, three hours; discussion, one hour. A survey of theater forms of the non-European world in which primary attention will be concentrated on an examination and analysis of the traditional dance-drama and puppet theaters of East Asia, Southeast Asia, South Asia, the Middle East and Africa. Analogous forms from European Theater will be included for comparative purposes. Mr. Helstien

10. Fundamentals of Theater Production.

Lecture, three hours; laboratory, four hours. Required in the first quarter of residency for theater arts majors specializing in theater and general secondary credential. A basic study of the relationship of acting, stage management, scenery, lighting, costume and sound to the production of the play. Emphasis will be placed on the planning, procedures, materials, equipment and disciplines of theater production. Mr. Ward, Mr. Crabs

20A. Acting Fundamentals.

Required of theater arts majors with specialization in theater, secondary teaching credentials, television. 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. Lane

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. Mrs. Lane

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. Selected Topics on the History of the European Theater.

Lecture, three hours. Prerequisite: course 5A or the equivalent and consent of the instructor. An in-depth investigation of a selected area of study in theater history from the Greeks through the Renaissance. Mr. Mueller

102B. Selected Topics on the History of the European Theater.

Lecture, three hours. Prerequisite: course 5B or the equivalent and consent of the instructor. An in-depth investigation of a selected area of study in theater history from the Baroque to the present. Mr. Mueller

102D. History of the European Theater.

Lecture, three hours. Prerequisite: consent of the instructor. A survey of the development of the physical theater from the Greeks to the present. May not be taken for credit by students who have had courses 5A and 5B. Mr. Mueller

103A. Black People's Theater in America—Slavery to 1930.

Lecture, three hours. An exploration of all extant materials on the history and literature of the theater as developed and performed by Black artists in America from Slavery to 1930. (Not open for credit to those who have taken CED 135, CED 135A or CED 135B.) Miss Norman

103B. Black People's Theater in America—1930 to the Present.

Lecture, three hours. An exploration of all extant materials on the history and literature of the theater as developed and performed by Black artists in America from 1930 to the present. (Not open for credit to those who have taken CED 135, CED 135A or CED 135B.) Miss Norman

104. History of the American Theater.

Lecture, three hours. The history of the American theater from the Revolutionary War to the present. Mr. Hethmon

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. Mueller

117. The Puppet Theater. (½ course)

Lecture, two hours; laboratory, four hours. Prerequisite: 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. May be repeated for a maximum of 6 units credit. (Not open for credit to those who have had 6 units of 117A, 117B, 117C.) Mr. Helstien

118A. Creative Dramatics.

Studies of the principles and procedures of the informal approach to children's drama through creative interpretation of literature.

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.

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. Intermediate Acting for the Stage.

Prerequisite: course 20A or consent of the instructor. Study and practice of the art of acting at the intermediate level. Mrs. Lane

120B. Intermediate Acting for the Stage.

Prerequisite: consent of the instructor. Study and practice of the art of acting at the intermediate level. Mrs. Lane

121A-121B-121C. Advanced Problems in Acting.

Lecture and laboratory, six hours. Prerequisites: Admission to acting specialization. Scene study and the techniques of characterization. Mr. Ferguson

121D-121E-121F. Advanced Problems in Voice and Movement.

Lecture and laboratory, six hours. Prerequisites: Admission to acting specialization. Voice and movement for the actor. Not open for credit to those who have had credit previously for 121D, 121E or 121F. Mr. Ferguson, Mrs. Egilsson

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. Mrs. Lane

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. Lee

130B. Fundamentals of Playwriting II. (2 courses)

Lecture, six hours. Prerequisites: course 130A and consent of writing staff. Study in original material for the theater, its preparation and its development. Course is designed to give further insight into critical and creative aspects of the one-act form. Guidance in the completion of a one-act play. Mr. Gordon

130C. Fundamentals of Playwriting III.

Lecture, six hours. Prerequisites: courses 130A, 130B, and consent of the writing staff. Further study in original material for the theater—its preparation and its development. Discussion and interpretation of the one-act and full length forms. Guidance in completion of original material as deemed appropriate by the instructor. Mr. Gordon

130D. Fundamentals of Playwriting IV. (2 courses)

Lecture, six hours. Prerequisites: courses 130A-130B-130C and consent of the writing staff. Further study in original material for the theater—its preparation and its development. Discussion and interpretation of the full length play. Guidance in completion of original material as deemed appropriate by the instructor. Mr. Gordon

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. Gordon

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.

Lecture, three hours; laboratory, four hours and additional hours to be arranged relating to the preparation of scenery for a major production. Prerequisite: Theater Arts 10 or approved equivalent. (Not open to students for credit who have taken

140A prior to Fall 1970.) (Courses 140A, 141A, and 142A may be taken in any sequence, but not concurrently). Required of theater arts majors specializing in theater and general secondary credential. An intensive study of scenic materials, construction techniques, production organization, and the rigging of scenery. Mr. Crabs, Mr. Ward

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.

141A. Lighting Techniques for the Stage.

Lecture, three hours; laboratory, four hours and additional hours to be arranged relating to the preparation of the lighting for a major production. Prerequisite: Theater Arts 10 or approved equivalent. (Not open for credit to students who have taken 141A prior to Fall 1970). (Courses 141A, 140A, and 142A may be taken in any sequence, but not concurrently). Required of theater arts majors specializing in theater and the general secondary credential. An intensive study of theater lighting with emphasis on the relationship of lighting instruments and control equipment to lighting design. Mr. Ward

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.

142A. Theater Costuming Techniques.

Lecture, three hours; laboratory, four hours and additional hours to be arranged relating to the preparation of costumes for a major production. Prerequisite: Theater Arts 10 or approved equivalent. (Not open for credit to students who have taken 142A prior to Fall 1970). (Courses 142A, 140A, and 141A may be taken in any sequence, but not concurrently). Required of theater arts majors specializing in theater and the general secondary credential. The study of costumes analysis and the interpretation of theatrical costume design through the use of patterns, fabrics, and related costume materials. Mr. Jones

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. Mr. Jones

143A. Scenic Design for the Theater. (½ course)

Lecture, two hours; laboratory, two hours. Prerequisite: Theater Arts 10 or approved equivalent. (Not open for credit to students who have taken 143A prior to Fall 1970). 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

144A. Theater Sound Techniques. (½ course)

Lecture, two hours; laboratory, 2 hours. Prerequisite: Theater Arts 10 or approved equivalent. A study of the equipment and techniques utilized in the recording and reproduction of sound for the theater. Not open for credit to students who have taken 144. Mr. Ward

144B. Advanced Theater Sound.

Lecture, three hours; laboratory, six hours. Prerequisite: 144A or consent of the instructor. A detailed study of theater sound with emphasis on the composition and execution of theater sound tracks, recording techniques, and acoustic reinforcement. Mr. Ward

145. Costume Design for the Theater.

Prerequisite: 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

146B. Scene Painting Techniques. (½ course)

Hours to be arranged. Prerequisite: consent of the instructor. 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

149A. Basic Drafting Techniques for the Stage. (½ course)

Lecture, one hour; laboratory, two hours. Prerequisite: Theater Arts 10 or consent of instructor. Studies of the basic skills and techniques of drafting for the stage, through the execution of floor plans and evaluation drawings. Mr. Corrigan

149B. Advanced Drafting for Theater Arts.

Lecture, two hours; laboratory, three hours. Prerequisite: Theater Arts 143A or consent of instructor. An advanced 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

160A. Fundamentals of Play Direction.

Two two-hour meetings, with outside hours to be arranged. Prerequisite: course 130A. 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 140A, 141A and 142A. 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 10, 140A, 141A and 142A. Required of theater arts majors with specialization in theater or secondary teaching credential. The Staff

172C-172D. Technical Theater Laboratory.

(½ course each)

Hours to be arranged. Prerequisites: Courses 10, 140A, 141A, 142A, 170, 172A and 172B. Credit for production performance. Required of theater arts majors in theater and the 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/TELEVISION 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. May be repeated for credit (maximum 2 courses) with departmental consent.* 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. May be repeated for credit (maximum 2 courses) with departmental consent.*

106C. History of African, Asian and South American Film.

Lecture, three hours. Prerequisite: consent of instructor. A critical, historical, aesthetic and social study—together with an exploration of the ethnic significance—of Asian, African, Latin American and Mexican films.

Mr. Taylor

107. Experimental Film.

Lecture, 4 hours; laboratory, to be arranged. This course may be repeated for credit with departmental consent (maximum 2 courses).^{*} 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.

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

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. Suber

110. History of Television and Radio.

Lecture, four hours. Prerequisite: course 5C. Required of television specialization. Critical survey of television and radio history here and abroad. Consideration of the social responsibilities and educational implications of broadcasting.

Mr. Kingdon, Mrs. Schwartz

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 (maximum 2 courses) with departmental consent.* A study in depth of a specific film author (director or writer).

Mr. Bradley, 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).^{*} Study of a specific film genre, e.g. the Western, the gangster cycle, the musical, the silent epic, the comedy, the social drama.

Mr. Bradley, Mr. Epstein, Mr. Suber

115. Producers and Their Films.

Lecture, four hours; discussion, three hours; laboratory, three hours. A consideration of the individual or corporate producers as they have effected the art and industry of the motion picture. Course content will vary, considering the work of a studio such as Paramount, Metro-Goldwyn-Mayer, Warner Brothers, etc. or of an individual such as Samuel Goldwyn, Stanley Kramer, Hal Wallis, etc. May be repeated for credit for a maximum of 2 courses (8 units).

The Staff

116. Criticism.

Lecture, four hours; laboratory, to be arranged. May be repeated for credit (maximum 2 courses) with departmental consent.* Study of and practice in criticism for the theater, motion pictures and television.

Mr. Fagen

126A. Advanced Acting for Television and Motion Pictures.

Laboratory, six hours. Prerequisite: course 20A or consent of the instructor. Projects in acting for television and motion pictures. Video tape recording of selected acting exercises and readings. May be repeated for credit for a maximum of 12 units.

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. Kingdon

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.

134. Film/Television Writing. (1 or 2 courses)

Lecture, four hours. This course is not open for credit to students who have had 134A or 134B. Introduces students to problems in film/television

* Determined on basis of change in course content.

writing and determines candidacy for advancement in writing specialization in second-year program.

Mr. Menger, Mr. Thor

135A-135B-135C. Advanced Film/Television Writing. (2 courses each)

Lecture, three hours. Prerequisite: admission to writing specialization. A double course in second-year film/television 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. Thor

137A-137B-137C. Advanced Film/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. 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 course credits. Supervised exercises in editing for motion pictures.

Mr. Brokaw

158. Motion Picture Studio Production. (3 courses)

Lecture, fourteen hours; laboratory, fourteen hours. Prerequisites: 179A and consent of instructor, which will be limited to students who have been approved for 179B or for television production. An introduction to the making of feature-length studio motion pictures. The course involves the production

of a medium length film, with instruction aimed at developing the student's awareness of the various specializations involved in such an undertaking.

164. Direction for Motion Pictures. (1, 2 or 3 courses)

Hours to be arranged. Prerequisites: Film Project 1 (course 179A) and consent of the project faculty. May be repeated for a maximum of three course credits. Supervised exercises in motion picture direction.

The Staff

165. Direction for Television.

Laboratory, six hours. Prerequisite: 179A, 185 and consent of the instructor. Instruction and supervised exercises in television direction with emphasis on the creative use of cameras, sound, composition, and communication with those in front of and behind the camera. May be repeated for credit; maximum three courses.

Mr. Ross

179A. Film Project 1. (2 courses)

Hours to be arranged. Required in the motion picture/television 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 in charge

180A-180B-180C. Workshop in Broadcast News and Documentary. (1 or 2 courses each)

Discussion, three hours; laboratory, five hours. Prerequisite: Consent of the instructor. Instruction and supervised exercises in writing, reporting, editing, and producing radio and television news, public affairs, and documentary programs. In addition to classroom and workshop activities, students will be expected to gain practical experience by participation in the campus news bureau supervised by Professor LaTourette, Professor Richard Hawkins, and Mr. Edgar Brokaw. (Maximum: six courses for the series.)

Mr. LaTourette

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.

Mr. McLaughlin

181B. Writing for Animation. (1 or 2 courses)

Lecture, six hours; laboratory, eight hours. Prerequisites: course 181A, consent of the instructor and a storyboard at the first class meeting. Research and practice in creative writing and planning for the animated film. May be repeated for credit; maximum four courses (16 units).

Mr. McLaughlin

181C. Animation Workshop. (1 or 2 courses)

Lecture, six hours; laboratory, eleven hours. Prerequisites: course 181A, consent of the instructor and a storyboard at the first class meeting. Organization and integration of the various creative arts used in animation to form a complete study of a selected topic. May be repeated for credit; maximum four courses (16 units).

Mr. McLaughlin

185. Television Production.

Laboratory, eight hours. Prerequisite: junior standing and consent of the instructor. Instruction and supervised exercises in the basic use of camera, lighting and sound in the creation of television programs. Mr. Ross, Mr. Wollock

186A-186B-186C. Television Studio Laboratory.

Laboratory, eight hours. Prerequisites: 134, 179A, 185 and consent of the instructor. Instruction and supervised exercises in the creation, direction and production of advanced television programs.

Mr. Ross, Mr. Wollock

187A-187B-187C. Remote Television Broadcasting.

(1 course each)

Laboratory, four hours plus additional hours to be arranged. Prerequisite: consent of instructor. (187A offered Fall only; 187B offered Winter only; 187C offered Spring only.) 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

194A. Film Curatorship.

Lecture, two hours; discussion, two hours; laboratory, four hours. Prerequisite: consent of the instructor. Study of the principles and techniques of film curatorship and research, including but not limited to acquisitions, cataloguing, storage and retrieval systems. Special attention will be devoted to the application of new technology, equipment, and program materials to film archival-library design for research and teaching.

Mr. Epstein

194B. Television Curatorship.

Lecture, two hours; discussion, two hours; laboratory, four hours. Prerequisites: 110, 185 or consent of the instructor. Study of the principles and techniques of television curatorship and research, including but not limited to acquisitions, cataloguing, storage and retrieval systems. Special attention will be devoted to the application of new technology, equipment, and program materials to television archival-library design for research and teaching.

Mrs. Schwartz

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**199. Special Studies in Theater Arts.**

(½ to 2 courses)

Hours to be arranged. Prerequisites: senior stand-

ing 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 93-97.

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.

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, Mr. Kerans

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, Mr. Mueller

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.

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.

208B. Film Aesthetics.

Prerequisite: consent of the instructor. Study and analysis of the film in relation to other art forms.

209A. Seminar in Documentary Film.

Lecture, two hours. Prerequisite: consent of the instructor. The nonfictional 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.

M209C. Seminar in Ethnographic Film.

(Same as Anthropology M294A.) 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

210. Seminar in Contemporary Broadcast Media.

Prerequisite: consent of instructor. Recent and current developments in radio, television, satellites, cable and cartridge television, and telecommunication centers. Commercial broadcasting and alternative systems at home and abroad.

Mr. Kingdon, Mr. Walter

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. Mr. Ingle

220A-220B-220C. Problems in Acting.

Study of the principal theories of acting and their application in studio exercises and laboratory productions.

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.

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.

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

M265A-265B. Ethnographic Film Direction.

(1 to 2 courses)

(Same as Anthropology M294B-294C.) 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

270. Seminar in Film/Television Criticism.

Lecture, four hours. Prerequisite: consent of the instructor. An analysis of principal critical approaches and their relevance to the study and production of films and television.

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

M290A. The Role of Management in Artistic Decision Making.

(Same as Management M272A.) Lecture, four hours. A descriptive study of the criteria for decision making in artistic institutions including the role of the institution in society, the economic environment of the arts, and the artistic value systems of arts organizations.

Mr. Cauble

M290B. Programming and Planning Policies in Arts Organization.

(Same as Management M272B.) Lecture, four hours. An analysis of the social, artistic and economic roles of the arts as reflected in programming policy. An examination of the social goals pursued in establishing relationships between the arts and their environment.

Mr. Cauble

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

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.

298C. Special Courses in Theater Arts: Professional Internship in Film & Television. (3 courses)

Hours, to be arranged. Prerequisites: Graduate status plus all MFA requirements except thesis. An internship at various film and television studios accentuating the creative contribution, the organization, and the work of professionals in their various specialties. Mr. J. Young

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 or 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.

Mrs. Egilsson, Mr. Ferguson, Mr. Stockwell

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.

Mrs. Egilsson, Mr. Ferguson

420C. Advanced Techniques in Acting.**(1 or 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.

Mrs. Egilsson, Mr. Ferguson

420D-420E-420F. Advanced Techniques in Voice and Movement for the Stage.

Exercises in period styles of movement, vocal projection. Mr. Egilsson, Mr. Ferguson

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 the fall quarter.

Mrs. Egilsson, Mr. Ferguson

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.

Mrs. Egilsson, Mr. Ferguson

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.

Mrs. Egilsson, Mr. Ferguson

421D-421E-421F. Special Problems in Voice and Movement for the Actor.

Exercises in techniques of physical combat (fencing, staves, etc.). Dialect, regional speech, Shakespearean voice production.

Mr. Egilsson, Mr. Ferguson

432. Manuscript Evaluation.

Lecture, four hours; laboratory, to be arranged. Prerequisite: course 132 and consent of instructor or admission to M.F.A. writing program and consent of the instructor. 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. Thor

434. Advanced Film/Television Writing.**(1 to 2 courses)**

Lecture, three hours. 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.

Lecture, three hours. Prerequisites: courses 137A-137B-137C, 179A, and/or consent of the instructor. Advanced problems in writing for television.

437. Nondramatic Writing for Television.

Lecture, three hours. Advanced problems in the field of documentary and special feature programs with emphasis on research and pre-production.

442A-442B-442C. Advanced Problems in Costume Design.

Hours, to be arranged. Prerequisite: consent of the instructor. Study of costume design for theatrical productions. Development of costume designs from theatrical scripts with emphasis upon production styles and character revelation. The scripts vary in period and style to give design practice in the major costume periods and artistic styles. Restricted to MFA candidates. 442A is offered in Fall Quarter, 442B is offered in Winter Quarter, 442C is offered in Spring Quarter.

Mr. Jones

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

448. Production Planning in Motion Pictures.
(1/2 or 1 course)

Lecture, 3 hours; laboratory to be arranged. Prerequisite: consent of the instructor.

Mr. Grauel

457. Design for Television.

Lecture, one hour; laboratory, three hours. 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)

Hours to be arranged. 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)

Lecture, two hours; laboratory, six hours. 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. (1/2 course)

Lecture, two hours. Prerequisite: admission to M.F.A. program. Required each quarter for the M.F.A. in Theater. May be repeated for credit.

Mr. Crabs

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. (1 or 2 courses each)

Laboratory, eight hours. Prerequisite: consent of the faculty. Instruction and supervised exercises in reporting, writing, 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.

Mr. McLaughlin

485A-485B-485C. Advanced Television Production.
(1 or 2 courses each)

Laboratory, 16 hours. Prerequisites: Project 1 (course 179A), 185, 186A-186B-186C 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. Friedman

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.
(1/2 to 3 courses)

Hours to be arranged. Prerequisite: graduate standing. May be repeated by consent of the instructor.

The Staff

596B. Directed Individual Studies: Writing.
(1/2 to 3 courses)

Hours to be arranged. Prerequisite: graduate standing. May be repeated by consent of the instructor.

The Staff

596C. Directed Individual Studies: Directing.
(1/2 to 3 courses)

Hours to be arranged. Prerequisite: graduate standing. May be repeated by consent of the instructor.

The Staff

596D. Directed Individual Studies: Design.

(½ to 3 courses)

Hours to be arranged. Prerequisite: graduate standing. May be repeated by consent of the instructor. **The Staff**

596E. Directed Individual Studies: Acting.

(½ to 3 courses)

Hours to be arranged. Prerequisite: graduate standing. May be repeated by consent of the instructor. **The Staff**

596F. Directed Individual Studies: Production.

(½ to 3 courses)

Hours to be arranged. 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**

Related Courses in Other Departments

Classics 142. Ancient Drama.

Dance 20. Movement for the Stage.

121. Movement for the Stage.

152A-152B. Organization of Dance Performances.

English 10A-10B-10C. English Literature.

103. Shakespeare.

112. Children's Literature.

135A-135B-135C. Creative Writing: Drama.

167. The Drama, 1842 to the Present.

Humanities 1A-1B. World Literature.

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

The departments of Botanical Science and Zoology have now merged to form the Department of Biology. Students currently enrolled as majors in Botanical Science or Zoology may complete requirements as stated in the 1971-1972 General Catalog (or the Sup-

plement to the 1971-1972 General Catalog), or they may petition to change their majors to Biology.

Advising appointments and sample curricula are available in the Biology Student Affairs Office.

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Philip L. Frandson, *Associate Dean*

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Business Services:
Cashier's Office (Main):
Materiel Management (Purchasing):
Systems & Procedures:

Auxiliary & Service Enterprises

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Guest House:
Married Housing:
Parking:
Residence Halls:
Vending:
Communications:
Garage:
Printing & Production:

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Donald L. Reidhaar
Attorney for Residence Matters:
Aletha R. Titmus

Campus Police

Boyd Lynn, *Chief*

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Paul C. Hannum, *Director*
Architects & Engineers
Physical Plant
Environmental Health & Safety

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Baldwin C. Lamson, *Director*
John R. Moore, *Executive
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Hospital Administrator:
Kenneth M. Eastman

Public Affairs

Andrew J. Hamilton, *Public Affairs
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Public Information:
Chandler Harris, *Manager*

Alumni Relations and Development

Donald M. Bowman, *Executive Director*

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