

UNIV. OF
CALIFORNIA

COLLEGE OF
AGRICULTURE

GENERAL
CATALOGUE

PROSPECTUS
ANNOUNCEMENT

SCHOOL OF
VETERINARY
MEDICINE

TWO-YEAR
CURRICULA

1949-50

UNIVERSITY OF
CALIFORNIA

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DEPARTMENTS AT BERKELEY

FALL AND SPRING SEMESTERS

1949-1950

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CALENDAR, FALL SEMESTER, 1949-1950

Referring Primarily to the Departments of the University at Berkeley

Importance of early application: In order to give time for necessary correspondence and for due notice to applicants who may be required to take examinations for admission, applications and credentials should be forwarded to the University Admissions Director at the earliest possible date.

Aug. 15, Monday	Final date for applications for admission to the fall semester and credentials to be filed with the University Admissions Director. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.
Aug. 23, Tuesday	Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.
Sept. 12, Monday	Fall semester begins.
Sept. 12, Monday	Qualifying examinations for admission to certain courses, including Chemistry 1A and Mathematics 3 and 3A, will be held in the morning.
Sept. 12, Monday	Subject A Examination, 2 to 5 P.M.
Sept. 13, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.
Sept. 14, Wednesday	
Sept. 15, Thursday	
Sept. 19, Monday	
Sept. 29, Thursday	Instruction begins.
	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in January, 1950, file announcement of candidacy before 5 P.M., at the office of the Registrar, Administration Building.
Sept. 30, Friday	Last day for filing applications in candidacy for the master's degree, and the degree of Engineer to be conferred in January, 1950; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 6, Thursday	Last day for filing applications in candidacy for professional higher degrees (except the degree of Engineer), and for the degree of Doctor of Philosophy, to be conferred in June, 1950; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 24, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1950; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Nov. 12, Saturday	Last day for filing in final form with the committees in charge theses for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in January, 1950.
Nov. 24, Thursday	Thanksgiving Day—an academic and administrative holiday.
Dec. 17, Saturday	Last day for filing in final form with the committees in charge theses for the master's degree and the degree of Engineer, to be conferred in January, 1950.
Dec. 19, Monday	} Christmas Recess—an academic holiday.
Dec. 31, Saturday	
Dec. 24, Saturday	} Christmas Holiday—an academic and administrative holiday.
Dec. 26, Monday	
Dec. 31, Saturday	Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1950-1951.
Jan. 2, Monday	New Year's Holiday—an academic and administrative holiday.
Jan. 3, Tuesday	Instruction resumes.
Jan. 16, Monday	} Final examinations in the departments at Berkeley.
Jan. 26, Thursday	
Jan. 26, Thursday	
	Fall semester ends.

CALENDAR, SPRING SEMESTER, 1950

Referring Primarily to the Departments of the University at Berkeley

Importance of early application: In order to give time for necessary correspondence and for due notice to applicants who may be required to take examinations for admission, applications and credentials should be forwarded to the University Admissions Director at the earliest possible date.

Jan. 16, Monday	Applications for admission to the spring semester and credentials to be filed with the University Admissions Director.
Jan. 17, Tuesday	Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
Feb. 6, Monday	Spring semester begins.
Feb. 7, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the spring semester.
Feb. 8, Wednesday	
Feb. 9, Thursday	
Feb. 13, Monday	Instruction begins.
Feb. 20, Monday	Last day for filing applications for fellowships and graduate scholarships for 1950-1951.
Feb. 22, Wednesday	Washington's Birthday—an academic and administrative holiday.
Feb. 23, Thursday	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in June, 1950, file announcement of candidacy before 5 P.M., at the office of the Registrar, Administration Building.
Feb. 24, Friday	Last day for filing applications in candidacy for the master's degree and the degree of Engineer, to be conferred in June, 1950; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 1, Wednesday	Last day for entering students to file applications for undergraduate scholarships for 1950-1951.
Mar. 3, Friday	Last day for filing applications in candidacy for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in September, 1950; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 6, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1950; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Apr. 1, Saturday	Last day for filing in final form with the committees in charge theses for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in June, 1950.
Apr. 24, Monday	} Spring recess—an academic holiday.
Apr. 29, Saturday	
May 15, Monday	Last day for filing in final form with the committees in charge theses for the master's degree and the degree of Engineer, to be conferred in June, 1950.
May 30, Tuesday	Memorial Day—an academic and administrative holiday.
June 5, Monday	} Final examinations in the departments at Berkeley.
June 15, Thursday	
June 15, Thursday	
	Spring semester ends.

THE REGENTS OF THE UNIVERSITY

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Litt.D.
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203 Administration bldg, Los Angeles 24

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240 Administration bldg, Berkeley 4

THE UNIVERSITY OF CALIFORNIA

GENERAL INFORMATION about instruction at Berkeley and Davis may be obtained by addressing the Registrar, University of California, Berkeley 4; for information about instruction at Los Angeles, address the Registrar, University of California, Los Angeles 24; for information about instruction at Santa Barbara College, address the Registrar, University of California, Santa Barbara College, Santa Barbara; information concerning the schools and colleges in San Francisco may be obtained by addressing the deans in charge.

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(This list includes primarily officers whose duties are statewide and officers on the Berkeley campus.)

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101 Giannini Hall, Berkeley 4

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203 Administration bldg, Los Angeles 24

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THE UNIVERSITY OF CALIFORNIA

FOUNDED 1868

THE UNIVERSITY OF CALIFORNIA is composed of academic colleges, professional schools, divisions, departments of instruction, museums, libraries, research institutes, bureaus and foundations, and the University of California Press, situated on eight different campuses throughout the State, namely: Berkeley, Los Angeles, San Francisco, Davis, Riverside, Mount Hamilton, La Jolla, and Santa Barbara. A list of the divisions on each campus follows:

I. AT BERKELEY

The Colleges of

Letters and Science

Agriculture (including the Department of Agriculture, the Agricultural Experiment Station, and the Agricultural Extension Service)

Chemistry

Engineering

Pharmacy (first year of the B.S. curriculum)

The Schools of

Architecture

Business Administration

Education

Forestry

Jurisprudence

Librarianship

Medicine (first year)

Nursing (in part)

Optometry

Public Health (in part)

Social Welfare

The Graduate Division (Northern Section)

The University Extension (offering instruction wherever classes can be formed, or anywhere in California by correspondence, and providing lectures, recitals, moving pictures, and other material for visual instruction)

The California Museum of Vertebrate Zoölogy

The Museum of Paleontology

The Anthropological Museum

The Heller Committee for Research in Social Economics

The Institute of Child Welfare

The Institute of Experimental Biology

The Institute of Geophysics (in part)

The Institute of Industrial Relations (in part)

The Institute of Slavic Studies

The Institute of Transportation and Traffic Engineering

The Bureau of Business and Economic Research
 The Bureau of Criminology
 The Bureau of International Relations
 The Bureau of Public Administration
 The William H. Crocker Radiation Laboratory
 The University Art Gallery
 The University of California Press
 The Bancroft Library
 The Alexander F. Morrison Memorial Library

Departments of Instruction in the Colleges at Berkeley

Agriculture (including Plant Science, Animal Science, Entomology and Parasitology, Agricultural Economics, Food Technology, Home Economics, Soil Chemistry, Soil Science, and Landscape Design), Anatomy,* Anthropology, Architecture, Art, Astronomy, Bacteriology, Biochemistry,* Botany, Business Administration, Chemistry and Chemical Engineering, City and Regional Planning, Classics (Greek, Latin, Sanskrit), Decorative Art, Dramatic Art, Economics, Education, Engineering (civil, electrical, engineering design, irrigation, mechanical, mineral technology), English, Forestry, French, Geography, Geological Sciences (and Mineralogy), German, History, Italian, Journalism, Jurisprudence, Librarianship, Mathematics, Military Science and Tactics, Music, Naval Science, Near Eastern Languages, Nursing, Optometry (and Physiological Optics), Oriental Languages, Paleontology, Philosophy, Physical Education, Physics, Physiology,* Political Science, Psychology, Public Health, Romance Philology, Scandinavian Languages and Literature, Slavic Languages, Social Welfare, Sociology and Social Institutions, Spanish and Portuguese, Speech, Veterinary Science, Zoölogy.

II. AT LOS ANGELES†

The Colleges of

Letters and Science
 Business Administration
 Engineering
 Applied Arts

Agriculture (including courses of instruction and the Agricultural Experiment Station's activities in Los Angeles)

The Schools of

Law
 Education
 Medicine
 Public Health (in part)

The Graduate Division (Southern Section)

* A division of the Medical School.

† A more detailed description of instruction offered at Los Angeles will be found on page 21.

The Summer School of Surveying
The Bureau of Governmental Research
The Institute of Geophysics (in part)
The Institute of Industrial Relations (in part)
The Institute of Transportation and Traffic Engineering (in part)
The Senator William Andrews Clark Memorial Library
The Los Angeles Medical Department (graduate instruction only)

III. AT SAN FRANCISCO

Medical School (second, third, and fourth years, including the University Hospital and Langley Porter Clinic)
School of Nursing (in part)
School of Public Health (in part)
The George Williams Hooper Foundation (for medical research)
College of Dentistry
College of Pharmacy
California School of Fine Arts
Hastings College of the Law

IV. AT DAVIS

The College of Agriculture, including the University Farm, the School of Veterinary Medicine, and certain divisions of the Department of Agriculture and of the Agricultural Experiment Station.

V. AT RIVERSIDE

The College of Agriculture, including the Citrus Experiment Station.

VI. AT MOUNT HAMILTON

The Lick Astronomical Department (Lick Observatory).

VII. AT LA JOLLA

The Scripps Institution of Oceanography.

VIII. AT SANTA BARBARA

Santa Barbara College.

ELSEWHERE

In addition to the principal divisions named above, the University maintains several field stations of the Agricultural Experiment Station in various parts of the State.

ADMINISTRATION

The Regents of the University of California, by authority vested in them by the State constitution, created an academic administrative body called the Academic Senate. The Senate, subject to the approval of the Regents, determines the conditions for admission, for certificates, and for degrees. It authorizes and supervises all courses of instruction in the academic and professional

colleges and schools. It recommends to the Regents all candidates for degrees in course and has general supervision of the discipline of students. The dean or director of a school, college, or other division of the University is entrusted with the duty of assisting the President in the administration of the University, with special reference to the welfare of the particular school, college, or other division concerned, and of the students therein.*

SURVEY OF CURRICULA

In order that the student may gain some idea of the scope of the curricula offered—undergraduate, professional, and graduate—and of the academic and professional opportunities that are open to him, there is presented in the following paragraph a cursory but fairly comprehensive outline of the programs of instruction offered in the different schools and colleges.

THE FOUR UNDERGRADUATE COLLEGES

Four academic colleges at Berkeley offer undergraduate curricula of four years, leading, in the College of Letters and Science, to the bachelor's degree in arts (A.B.), and in the three colleges of applied sciences to the bachelor's degree in science (B.S.). Students who complete successfully the first two years of the undergraduate curriculum in the College of Letters and Science will qualify for the award of the degree of Associate in Arts. The undergraduate colleges are:

College of Letters and Science

Colleges of applied sciences—

College of Agriculture. In this college, curricula are open in the fields of plant science, animal science, agricultural economics, entomology and parasitology, home economics, soil science, landscape design, or agricultural education.

College of Chemistry. In this college, the student may choose a program in chemistry or a program in chemical engineering.

College of Engineering. The student in this college may elect agricultural engineering, civil engineering, electrical engineering, engineering physics, industrial engineering, mechanical engineering, mining, metallurgy, mineral exploration, petroleum engineering, or process engineering.

In civil engineering, he has a further choice of construction, structural, transportation, irrigation, or sanitary and municipal engineering.

In electrical engineering, the student may select options in business administration, communications, illumination, industrial electronics and control, physics, or power.

In mechanical engineering, the student has a choice of options in air conditioning and refrigeration, automotive, fluid mechanics, heat

* For a list of the administrative staff of the University at Berkeley, and elsewhere, see page 9.

power, heat transfer and thermodynamics, industrial, marine engineering, or mechanical design.

In metallurgy there are open to the student the fields of physical or process metallurgy.

In mineral exploration the student may elect mining geology or petroleum geology.

In process engineering, the student has a choice of options in heat and thermodynamics, fluid mechanics, design, or food technology.

PROFESSIONAL CURRICULA

The professional curricula offered by the University are based on two or more years of undergraduate work. Some of the curricula may be carried to completion at Berkeley; others must be pursued in part at Berkeley and completed in San Francisco or at Davis; others may be pursued in full in San Francisco. These curricula lead to the higher degrees, or to degrees and/or certificates, in the respective fields of architecture, business administration, city planning, criminology, dentistry, education, engineering, forestry, jurisprudence, law, librarianship, medicine, pharmacy, public health, nursing, optometry, and social welfare. Full details of the respective curricula will be found in later pages of this bulletin.

The Professional Schools—

The School of Architecture offers a curriculum of two years leading to the bachelor's degree and a curriculum of four years leading to the degree of Graduate in Architecture. See also the two-year curriculum in the College of Letters and Science.

The School of Business Administration offers two programs. The first, beginning with junior standing in the University, normally requires two years and leads to the degree of Bachelor of Science. The second, a graduate curriculum, is based upon the bachelor's degree and leads to the degree of Master of Business Administration. The degree of Master of Business Administration normally requires from one to two years, depending upon the undergraduate preparation. Students who have completed the work for the degree of Bachelor of Science in the School of Business Administration should be able to complete the requirements for the degree of Master of Business Administration in one year.

The School of Education offers two programs. The first (a three-year curriculum) covers, with the required preliminary work, a total of five years—the four usual undergraduate years leading to the bachelor's degree, and an additional postgraduate year leading to the Certificate of Completion of teacher-training curricula. The second program (a two-year curriculum following the bachelor's degree) requires six years—the four undergraduate years leading to the bachelor's degree, and two postgraduate years, leading either to the degree of Master of Education or to the degree of Doctor of Education.

The School of Forestry offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science, Master of Forestry, and Master of Science. For further details consult the special ANNOUNCEMENT OF THE SCHOOL OF FORESTRY.

The School of Jurisprudence offers the following curricula:

1. A three-year curriculum leading to the degree of Bachelor of Laws. Applicants for admission to the professional curriculum must have received the degree of Bachelor of Arts or Bachelor of Science from the University of California, or an equivalent degree from a college or university of approved standing. Exceptions will be made for war veterans eligible for admission to senior standing at the University of California. Senior students in the College of Letters and Science who may be admitted to the School may offer the first year's work in law in place of a major for the degree of Bachelor of Arts. (For admission requirements, see under School of Jurisprudence in later pages of this bulletin and consult the ANNOUNCEMENT OF THE SCHOOL OF JURISPRUDENCE, a copy of which may be obtained from the Dean of the School.)

2. A graduate curriculum of one year, based on the degree of Bachelor of Laws and leading to the degrees of Master of Laws (LL.M.) or Doctor of the Science of Law (J.S.D.). Admission to the second curriculum, it is to be noted, is limited to applicants who hold both an academic bachelor's degree and a professional degree in law (LL.B.) from approved institutions.

The School of Librarianship offers a curriculum of two years based on the bachelor's degree (six years in all), leading at the end of the first (fifth) year to the Bachelor of Library Science degree, and at the end of the second (sixth) year to the degree of Master of Library Science.

The Medical School prescribes a curriculum of four years based on three years of undergraduate work in the College of Letters and Science, a total of seven years. Four of these years are spent in Berkeley, the rest in San Francisco. Admission to the school may be granted upon the attainment of senior standing in the premedical curriculum in the College of Letters and Science. The student's senior year in the College of Letters and Science is thus his first year in the Medical School; the student is enrolled in both the college and the school; he is subject to all the regulations of the college, and upon the completion of the first year in the Medical School he may receive the degree of Bachelor of Arts from the college. The second, third, and fourth years of the curriculum of the Medical School are given in San Francisco, and they lead to the degree of Doctor of Medicine.

In addition, the Medical School offers practical training in clinical techniques for a limited number of qualified students.

The School of Nursing, in connection with the University Hospital, offers a curriculum of five years, leading to the degree of Bachelor of Science, and to a Certificate in Nursing. Matriculation and the completion of the lower division requirements in the College of Letters and Science or in the College of

Applied Arts are required. The program includes two years in the College of Letters and Science at Berkeley or Los Angeles or in the College of Applied Arts at Los Angeles, and three years in the School of Nursing.

The School of Optometry offers a curriculum of three years based on the completion of requirements for the degree of Associate in Arts in the College of Letters and Science, leading to the degree of Bachelor of Science at the end of two years, and the Certificate of Completion in Optometry and to the Master of Optometry degree at the end of an additional graduate year.

The School of Public Health offers curricula on both the undergraduate and the graduate levels. Students may be admitted to the undergraduate curricula leading to the degree of Bachelor of Science upon completion of the degree of Associate in Arts or its equivalent. The graduate curricula lead to the degrees of Master of Public Health and Doctor of Public Health.

The School of Social Welfare offers a curriculum of two years, based upon the bachelor's degree, and leading to the degree of Master of Social Welfare.

The School of Veterinary Medicine (at Davis) offers a curriculum of four years, based upon two or more years of undergraduate work, and leading to the degree of Doctor of Veterinary Medicine.

The Professional Colleges—

The College of Dentistry offers three curricula: a six-year curriculum leading to the degrees of Bachelor of Science and Doctor of Dental Surgery; a curriculum, limited to women students, in the training of dental hygienists; and a graduate curriculum of three years leading to the degree of Master of Dental Surgery.

The academic (undergraduate) and professional curriculum leading to the degrees of B.S. and D.D.S. covers six years. The degree of Bachelor of Science is awarded at the end of five years—two years in the College of Letters and Science at Berkeley or Los Angeles, followed by three years of the four-year professional curriculum in the College of Dentistry at San Francisco—and the degree of Doctor of Dental Surgery is awarded after one additional year (the fourth year of the professional curriculum) in San Francisco. The degree of Master of Dental Surgery is awarded upon completion of a graduate curriculum of three years, following receipt of the degree of Doctor of Dental Surgery.

For the training of dental hygienists a four-year curriculum is offered, including two years of academic instruction similar in scope and content to that required for admission to the curricula in dentistry, followed by two years of professional training in dental hygiene. On completion of the curriculum for dental hygienists, the degree of Bachelor of Science is awarded.

The Hastings College of the Law offers a curriculum of three years, based upon the degree of Associate in Arts in the University of California or its equivalent (a total of five years) which leads to the degree of Bachelor of Laws.

The College of Pharmacy offers a four-year curriculum leading to the degree of Bachelor of Science in Pharmacy. The requirements for admission are the same as the requirements for admission to the academic departments of the University. The first year of this curriculum is given at Berkeley and Los Angeles; the final three years comprise specialized training in the College of Pharmacy in San Francisco.

Graduate Curricula in Engineering—

Curricula in engineering lead to the following advanced professional degrees: Master of Engineering, Civil Engineer, Electrical Engineer, Mechanical Engineer, Metallurgical Engineer, Mining Engineer, and Petroleum Engineer.

Special Professional Curricula—

The professional curriculum in public health nursing leads to the Certificate in Public Health Nursing, awarded by the School of Nursing to students who (a) have completed the requirements of the B.S. degree in the curriculum for undergraduate students in nursing, provided they hold the Certificate of Completion in Nursing and have completed an additional program of prescribed study, including four months of supervised field practice; or (b) have completed the requirements of the B.S. degree in the curriculum for graduate nurses, and in addition have completed four months of supervised field practice in public health nursing.

The professional curriculum in nursing education leads to the Certificate in Nursing Education, awarded by the School of Nursing to students who (a) have completed the requirements of the B.S. degree in the curriculum for undergraduate students in nursing, provided they hold the Certificate of Completion in Nursing and have completed an additional program of study prescribed by the School of Nursing, including four months of supervised field practice in nursing education; or (b) have completed the requirements of the B.S. degree in the curriculum for graduate nurses and in addition four months of supervised field practice in nursing education.

The professional curriculum in hospital dietetics requires one year of work following the bachelor's degree (including one semester's residence at the University Hospital in San Francisco and one semester in the Graduate Division at Berkeley) and leads to a Certificate of Completion of the Curriculum in Hospital Dietetics.

The course in physical therapy is given at the Medical School in San Francisco. It requires a period of one year divided into two semesters and two summer sessions of six weeks each and leads to a certificate or to a B.S. degree in the Medical School with a major in physical therapy.

The course for orthoptic technicians is given at the Medical School in San Francisco. The requirements for admission to the course are a bachelor's degree or equivalent training. The total training period is eight months and leads to a Certificate of Completion of the Course for Orthoptic Technicians.

A field of study stressing either the technical or social aspects of criminology leads to the degree of Master of Criminology after at least one year of prescribed graduate work. Candidates must have received the degree of Bachelor of Arts or Bachelor of Science, must have completed an approved program of study, and must either present an acceptable thesis or pass a comprehensive examination.

A field of study in city planning leads to the degree of Master of City Planning after at least two years of prescribed graduate work. Candidates must have received the degree of Bachelor of Arts or Bachelor of Science, must have completed an approved program of study, and must either present an acceptable thesis or pass a comprehensive examination.

UNIVERSITY OF CALIFORNIA, LOS ANGELES

The University of California, Los Angeles, comprises: (a) the College of Letters and Science, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science, curricula of the earlier years of the College of Dentistry and of the Medical School; (b) the College of Applied Arts, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science, curricula of the earlier years of the College of Pharmacy and the School of Optometry, and a curriculum leading to the Certificate in Public Health Nursing; (c) the College of Business Administration, with curricula leading to the degrees of Associate in Arts and Bachelor of Science; (d) the College of Agriculture, with curricula leading to the degree of Bachelor of Science; (e) the College of Engineering, with curricula leading to the degree of Bachelor of Science; (f) the School of Education, with teacher-training curricula leading to certificates of completion for the various elementary and secondary teaching credentials, and for the administrative credential; and (g) the School of Law, with curricula leading to the degrees of Bachelor of Laws, Master of Laws, and Doctor of the Science of Law. Graduate studies, leading to the degrees of Master of Science and Master of Arts, and to the degrees of Doctor of Education, Doctor of Philosophy, and Doctor of Public Health are available in the Graduate Division, Southern Section.

SUMMER SESSIONS

During the summer the University conducts at Berkeley one or more sessions of six weeks' duration each. In 1949 two such summer sessions of six weeks each were conducted, the first session beginning June 20, and the second beginning August 1. Information concerning the Summer Sessions of 1950 will be published in the ANNOUNCEMENT OF THE SUMMER SESSIONS, obtainable upon request from the Office of the Summer Sessions, Administration Building, University of California, Berkeley 4, California.

In addition to the sessions at the University on the Berkeley campus, Summer Sessions are conducted annually by the University of California on the Los Angeles campus, and on the Santa Barbara College campus.

UNIVERSITY EXTENSION

While University Extension is increasingly designing its services for the adult who has been to college, most of its classes, correspondence courses, short term institutes, and lectures are open to any man or woman who seeks higher education but who has found it impossible to take up residence at the University.*

The educational services of University Extension are organized around three primary aims: to help men and women advance professionally; to aid them in meeting their responsibilities as citizens; to assist in their pursuit of intellectual interests.

Five principal methods of instruction are used by University Extension:

(1) Classes are organized in cities and towns wherever a sufficient number of people can be secured who wish to study a subject.

(2) Correspondence courses offer lessons, study materials, and University faculty guidance by mail.

(3) Institutes for periods ranging from two days to several weeks provide intensive familiarization courses for interested groups.

(4) Lectures, singly or in series, are provided for any committee, club, organization, or community in the State that will make the necessary arrangements for their delivery.

(5) Visual education aids in the form of motion picture reels are available from film libraries maintained by University Extension in Berkeley and Los Angeles.

Of particular note are expanding programs utilizing the methods outlined above, in industrial relations, engineering, business administration, music, education, intensive language instruction, and postgraduate instruction in medicine, law, and dentistry. Instruction is also offered in art, economics, geography, history, literature, mathematics, political science, psychology, speech, dramatics, philosophy, and the sciences.

For catalogues and literature describing these services in detail, write to University Extension at any of the following addresses: University Extension, University of California, Berkeley 4; University Extension, University of California, Los Angeles 24; University Extension, University of California, 906 Santa Barbara Street, Santa Barbara.

THE UNIVERSITY LIBRARY

The Library on the Berkeley campus of the University of California consists of the General Library with its fourteen branch libraries, about thirty departmental and special libraries, and some fifty staff and office collections. These groups, collectively known as the University Library, contain more than 1,500,000 volumes. Approximately 18,000 periodicals and serials are received currently.

* For information concerning admission to the University through residence courses in University Extension, see page 30.

The principal collection of the General Library is housed in the Charles Franklin Doe Library Building, and in an Annex to be opened in the fall of 1949. This main library is centrally situated and supplies the basic library services for the majority of the faculty and students on the Berkeley campus.

The Biology Library is a branch situated in the Life Sciences Building, conveniently serving faculty and students of the life sciences. Other branches are the Architecture Library in the Architecture Building, the Astronomy Library in the Students' Observatory, the Chemistry Library in Gilman Hall, the Engineering Library in the Engineering Building, the Forestry Library in the Forestry Building, the Geological Sciences Library in Bacon Hall, the Lange Library of Education in Haviland Hall, the Library School Library in the main library building, the Matthew Memorial Library of Paleontology and the Mineral Technology Library in Hearst Memorial Mining Building, the Music Library in the Music Building, the Physics Library in LeConte Hall, and the Public Health Library in the Life Sciences Building.

The Alexander F. Morrison Library, housed in an attractively furnished room on the first floor of the main library building, is an open-shelf collection of about 20,000 volumes for recreational reading. It is open only to students and officers of the University, and its books are limited to use within the Morrison Library room.

The Bancroft Library of Californian, western American, and colonial Latin-American history, a department of the General Library, is on the fourth floor of the main library building.

Attention is directed especially to the following departmental and special libraries. The Law Library, situated in Boalt Hall, is used by the School of Jurisprudence. The Giannini Library, in Giannini Hall, is a collection of material in the field of agricultural economics, for the special use of the students and staff of the College of Agriculture. The Bureau of Public Administration and the Library of Economic Research, with a combined reading room, are on the first floor of the main library building. The Bureau of International Relations has its own collection and reading room in South Hall, situated near the Department of Political Science.

Registered students may draw books and periodicals from the University Library, according to the regulations of the various units, by presentation of their registration cards as identification. The privilege of borrowing does not include the right to transfer to another person the materials borrowed. Specifically, the lending of books or periodicals by an authorized borrower to any person not authorized to draw books from the Library is prohibited; also, the signing of call cards by an authorized borrower for the use of another person is prohibited. In certain circumstances an authorized borrower, by signing a form at the Library Loan Desk, may give special permission to another person to draw books in his name. A borrower is held responsible for any material borrowed in his name. Therefore, if a book is to be transferred

from one authorized borrower to another, a cancellation of the original charge at the desk from which the material was borrowed and a recharging to the new borrower is essential.

Any borrower intending to leave the vicinity for more than four days is required to return, before he leaves, all books and periodicals charged to him, or to make such arrangements with the Library as will insure their prompt return if needed.

ADMISSION TO THE UNIVERSITY

ADMISSION IN UNDERGRADUATE STATUS

AN APPLICANT WHO WISHES to enter the University must fulfill the general requirements for admission, as set forth below. Application blanks may be obtained from the University Admissions Director, 125 Administration Building, University of California, Berkeley 4. Every applicant for admission is required to pay a fee of \$5 when the first application is filed.† Remittance by bank draft or money order should be made payable to The Regents of the University of California. With the application for admission there must be filed a certificate showing successful vaccination against smallpox within the last seven years. A form for this purpose will be furnished by the University and must be signed by a licensed physician or registered nurse. Veterans of World War II need not file a certificate until after 1950, provided they present a written statement showing the nature and period of service in the armed forces of the United States.

The University of California bases its entrance requirements on two principles: first, that the best guarantee of success in the University is high quality of scholarship in previous work, and, second, that the study of certain specified subjects will give to the student both good preparation for the work of the University and reasonable freedom of choice of a major field of study after his entrance. These principles apply to admission in either freshman or advanced standing.

Limitation of Enrollment of Out-of-State Applicants

Within the limits of its capacity the University of California ordinarily makes no restriction on admission of applicants from areas outside of California. Out-of-state students will be admitted to the junior and senior classes provided they meet the regular requirements for admission to the University but enrollment in the freshman and sophomore classes will be restricted to students of exceptional promise (the upper half of applicants ordinarily eligible). Such applicants must submit, in addition to scholastic records, a properly certified standing on either the College Entrance Examination Board Scholastic Aptitude Test or the American Council on Education Psychological Examination.

There are special limitations concerning nonresidents in certain of the professional schools and colleges. Students desiring to enter these schools should keep informed as to the prerequisite requirements, date of application, and required aptitude examinations.

Examinations for Admission to College of Engineering

An engineering qualifying examination must be taken by all applicants for admission to the College of Engineering at either the freshman or junior level.

† Veterans who expect to enroll under the provisions of Public Law 346 or 16 are not required to remit this fee at the time of application; if the applicant is accepted and registers in the University, the fee will be paid by the government.

The first-year test is primarily an aptitude test, but presumes that the student has had the required subjects in high school, particularly those in mathematics through trigonometry, physics or chemistry, mechanical drawing, and English. No preparation beyond successful completion of the high school courses is required. The junior examination is based on the subject matter of the preengineering and engineering courses given in the first two years and presumes the completion of mathematics through integral calculus, general college chemistry, general college physics, descriptive geometry, and engineering drawing.

Admission in Freshman Standing

ADMISSION ON THE BASIS OF THE HIGH SCHOOL RECORD

The applicant must file with the Admissions Office a regular application, on or before the last date for the receipt of applications for the semester desired, and must have the secondary schools he has attended send to the Admissions Office complete transcripts of record of all studies undertaken in such schools. Such transcripts must show that the applicant has graduated from an accredited high school. The Admissions Office will then evaluate the high school record, and the applicant will be eligible for admission if he qualifies under any one of the following methods:*

1. Complete the high school courses listed under (a) to (f) below with marks that demonstrate ability to do university work with good prospect of success. Courses in the (a) to (f) list taken in the ninth grade need show passing marks only; courses in the (a) to (f) list taken in the tenth, eleventh, and twelfth grades must be passed with marks that will make an average of grade B. Courses in which a grade of D is received may not be counted either in reckoning the required scholarship or in satisfaction of the subject requirements. An A grade in one course will balance a C grade in another. Grades are considered on a semester basis, except from schools that give only year marks.

The courses that must be completed under this plan of admission are as follows:

- (a) History 1 unit.—This requirement must be satisfied by one unit of United States history or one unit of United States history and civics.
- (b) English 3 units.—These may consist of any six semesters that give preparation in written and oral expression and in the reading and study of literature. Reading and study of contemporary literature may be included. The requirement in English must be satisfied by credit designated "English."
- (c) Mathematics 2 units.—These must consist of two semesters of elementary or advanced algebra, and two semesters of plane geometry, or solid geometry and trigonometry.

* Although this minimum program will entitle the student to entrance to the University, it will not give him the right to enter unconditionally the curriculum of his choice unless he has credit for the prescribed subjects. Information regarding the preparation required and recommended for each curriculum may be found in later pages of this bulletin.

- (d) Science 1 unit. —This may consist of a year course in one field of science, namely, biology, botany, chemistry, physics, physical science, physiology, or zoölogy. The science selected must be an advanced (third- or fourth-year) laboratory science, and the two semesters must be in the same subject field.
- (e) Foreign language 2 units.—These must be in one language.
- (f) Advanced course chosen from one of the following:
 1 (or 2) units.—1. Mathematics, a total of 1 unit (second-year algebra, $\frac{1}{2}$ or 1 unit; solid geometry, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit);
 2. Foreign language, either 1 additional unit in the same foreign language offered under (e), or 2 units of a different foreign language;
 3. Science, 1 unit of either chemistry or physics in addition to the science offered under (d) above.

2. Achieve a scholarship rank in the highest tenth of his graduating class, with a substantial academic preparation, although he need not complete the exact pattern of subjects (a) to (f) listed above.

3. Complete not less than 15 high school units of grade A or B in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units of grade A or B in the work of the tenth, eleventh, and twelfth years; and not more than two subject deficiencies in the required list (a) to (f).

4. Complete not less than 15 high school units with no grade lower than C in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years; and not less than 6 high school units of grade A or B selected from the following 10 units of academic subjects:

Third- and fourth-year English

Third- and fourth-year mathematics

Third- and fourth-year laboratory science

Third- and fourth-year foreign language

Third- and fourth-year history.

5. Complete not less than 15 high school units with no grade lower than C in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years; and pass the *Examination in Subject A*; and have grade A or B in the following subjects:

Plane geometry, 1 unit

Second-year foreign language, 1 unit

Third- or fourth-year laboratory science, 1 unit

Requirement (f), 1 unit.

Accrediting of Schools in California

An accredited high school is one that has been officially designated by the Board of Regents of the University as a school from which graduates will be admitted to the University without examination on the basis of the high school

record of subjects completed and scholarship attained. The list of accredited schools is published by the University annually in the month of June or July. For information concerning the accrediting of schools, principals may communicate with the Director of Relations with Schools, Berkeley or Los Angeles.

Responsibility of High School Authorities

The responsibility for the granting of certificates to high school students lies with the high school authorities, and students naturally will be guided by their respective principals in making their preparation for entrance to the University.

Upon the high school authorities rests also the responsibility for determining the scope and content of courses preparatory to admission to the University and for certifying each course to the University under the proper subject designation of the high school program.

Preparation for University Curricula

In addition to those subjects required for admission to the University, outlined beginning on page 26, certain preparatory subjects are recommended for each University curriculum which, if included in the high school program, will give the student a more adequate background for his chosen field of study.*

Attention is directed especially to the fact that physics and chemistry are recommended in the preparation for the various curricula in the College of Letters and Science. This recommendation is made not only because of the value of each or both of these subjects as preparation for the courses of a particular curriculum, but also because completion of these subjects in the high school will meet a part of the requirements for the degree of Associate in Arts in the College of Letters and Science (see pages 67-70) and thereby will give the student greater opportunity in his freshman and sophomore years at the University to choose elective subjects. However, it should be understood that neither chemistry nor physics is required for admission to the University.

Especial care should be exercised by the high school student in selecting a foreign language. High school Latin is valuable in itself and will satisfy either the (b) or (c) requirements for the degree of Associate in Arts in the College of Letters and Science; other languages satisfy only the (b) requirement. The study of a modern language is important not only because of its value in a broad cultural preparation but also because a reading knowledge of foreign languages may be very useful in the pursuit of advanced work in many departments of the University.

Admission by Examination

The University of California does not itself offer entrance examinations, but accepts on all campuses the results of examinations given by the College Entrance Examination Board. Information about dates and places of examination

* See the separate circular, **PREREQUISITES AND RECOMMENDED SUBJECTS**, to be obtained from the Registrar, University of California, Berkeley 4.

may be secured from the Admissions Office or from the College Entrance Examination Board, P. O. Box 775, Berkeley 4, California, or P. O. Box 592, Princeton, New Jersey. Definite arrangements to take the tests must be made with the Board at least four weeks previous to the date of the tests. If the applicant has completed all of the subjects in the (a) to (f) list with grades of C or better, but is deficient in the scholarship average, he may clear his admission requirements by a satisfactory score on the Scholastic Aptitude Test and on three achievement tests in subject fields. If the (a) to (f) list of subjects has not been completed with grades of C or better, the applicant should consult the Admissions Office in regard to the tests he must take.

Admission of Returning Members of the Armed Forces

Some exceptions in the subject requirements for admission will be made for men and women who were for at least one year members of the armed forces of the United States in World War II. Such exceptions will apply, however, only when the scholarship record is high enough to indicate probable success in the University. Veterans whose scholastic records are good and whose high school subject deficiencies total not more than three units, are encouraged to make application, even though they may not have all of the usual requirements. A veteran with a good scholarship record but with subject deficiencies will be classified as a special student until deficiencies are removed, or until all of the requirements for junior standing in the college of his choice have been completed.

Removal of Admission Deficiencies

Deficiencies in high school scholarship or subject requirements must be removed by examination or additional studies before admission is approved. The applicant whose only deficiency arises from not having studied a required subject may remove the deficiency by a satisfactory grade in a course acceptable for that purpose, and by maintaining a satisfactory scholarship average in other studies pursued in the meantime. The applicant whose deficiency is caused by a low scholarship average or by a combination of low scholarship and incomplete subject preparation, may remove his deficiencies as follows:

1. By college courses of appropriate content and amount completed with satisfactory scholarship in junior colleges, or state colleges of California, or in other approved colleges. The applicant must include in his program courses acceptable for removing his subject shortages and present either:

- (a) Sixty units with at least an average of grade C in college transfer courses, or
- (b) A minimum of 15 units of college transfer courses with a grade point average of 1.5.

Ordinarily, it is recommended that graduates of California high schools who are not eligible for admission to the University attend one of the California junior colleges and complete there the lower division requirements of the college in which they wish to register.

2. By college courses in one of the three following divisions of the University of California:

- (a) *University Extension.*—These courses are of three types—correspondence, general adult education classes marked “X,” “XB,” “XL,” or “XSB,” and special classes designed to make up entrance deficiencies. There are no restrictions on enrollment in correspondence courses, but only those with 5 units or less of scholarship deficiencies in their high school records are eligible for the special program of class courses designed to make up entrance deficiencies. To be acceptable, grades received in this program must be definitely above the C average, and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.
- (b) *Combination Program of the College of Agriculture at Davis.*—Courses in the Combination Program of the College of Agriculture at Davis (open only to students who have not more than 3 units of scholarship and/or subject-matter deficiencies). Students cannot remove entrance deficiencies in the Two-Year Curriculum (nondegree course). See PROSPECTUS OF THE COLLEGE OF AGRICULTURE.
- (c) *Summer Session.*—For students with only one or two deficiencies the first summer session of the University may be used to make up shortages. Because of the short time between the end of the second summer session and the fall semester, the second summer session may not be used to make up deficiencies for entrance to the fall semester.

3. By postgraduate courses in accredited high schools.

4. By College Entrance Examination Board examinations (see page 28).

5. As an alternative to making up high school subject deficiencies, the Board of Admissions and Relations with Schools has approved an experimental plan of admission, limited to the years 1949–1953 inclusive. Under this plan an applicant may be admitted on the basis of a record showing completion of at least 60 units of C average work, in which must be included all of the subjects required for junior standing in the college or school of the University for which application is made.

Admission in Advanced Standing

An applicant for admission to the University in advanced standing must present evidence that he has satisfied, through either high school or college courses, the subjects and scholarship required for admission of high school graduates in freshman standing (see sections on admission from high school and on removal of admissions deficiencies) and that advanced work in institutions of college level has met the minimum scholarship standard required of transferring students, namely, an average of grade C or higher in all college courses undertaken.

As an integral part of the system of public education of California, the University of California accepts at full value academic courses completed with satisfactory grades in the public junior colleges of the State; students who intend to complete their advanced studies at the University will frequently

find it to their advantage to complete the first two years of their college course in one of the many excellent California public junior colleges.

An applicant may not disregard his college record and apply for admission in freshman standing; he is subject without exception to the regulations governing admission in advanced standing. He should ask the registrars of all preparatory schools and colleges he has attended to forward complete official transcripts directly to the University Admissions Director. A statement of honorable dismissal from the last college attended must also be sent.

Removal of Scholarship Deficiencies by Applicants from Other Colleges

Applicants otherwise eligible who seek to transfer from other institutions of collegiate rank but whose college records fail to show a satisfactory scholarship average may be admitted only when the deficiency has been removed by additional work completed with grades sufficiently high to offset the shortage of grade points. This may be accomplished by work in other approved higher institutions, in Summer Sessions, or in correspondence courses in University Extension. Except for veterans, applicants for advanced standing who have scholarship deficiencies will not be admitted to the admissions program classes of University Extension.

ADMISSION OF SPECIAL STUDENTS

Special students are students of mature years who have not had the opportunity to complete a satisfactory high school program, but who, by reason of special attainments, may be prepared to undertake certain courses in the University. The conditions for the admission of each applicant under this classification are assigned by the University Admissions Director. Ordinarily, a personal interview is required before final action can be taken. In general, special students are required to confine their attention to some special study and its related branches.

Transcripts of record from all schools attended beyond the eighth grade must be submitted. An applicant for special status may be required to take an aptitude test and the examination in Subject A. The University Admissions Director will supply, upon request, the forms of application for admission and for transcripts of high school record.

No person under the age of 21 years will be admitted as a special student, but attainment of any given age is not in itself a qualification for admission.

An applicant will not be admitted directly from high school to the status of special student. Graduates of high schools are expected to qualify for admission in accordance with the usual rules; students so admitted, if not candidates for degrees, may, with the approval of the proper study-list officer, pursue elective or limited programs.

The University has no "special courses"; all courses are organized for regular students. A special student may be admitted to those regular courses for which, in the judgment of the instructor, he has satisfactory preparation. A

32 *Admission from Foreign Schools and Colleges; Late Admission*

special student will seldom be able to undertake the work of the engineering and professional colleges or schools until he has completed the prerequisite subjects.

A special student may at any time attain the status of regular student by satisfying all the matriculation requirements for admission to the University, but an applicant will not be admitted to special status for the purpose of making up requirements.

ADMISSION FROM SCHOOLS AND COLLEGES IN FOREIGN COUNTRIES

The credentials of an applicant for admission from a foreign country, either in undergraduate or graduate standing, are evaluated in accordance with the general regulations governing admission. An application and official certificates and detailed transcripts of record should be submitted to the University Admissions Director several months in advance of the opening of the semester in which the applicant hopes to gain admittance. This will allow time for exchange of necessary correspondence relative to entrance and, if the applicant is admitted, be of assistance to him in obtaining the necessary passport visa.

An applicant from a foreign country whose education has been conducted in a language other than English may be admitted only after demonstrating that his command of English is sufficient to permit him to profit by instruction in this University. An applicant's knowledge of English is tested by an oral and written examination. This regulation applies to both graduate and undergraduate foreign students. The admission of an applicant who fails to pass this examination will be deferred until such time as he has acquired the required proficiency in the use of English.

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

Special advisers have been appointed by the President of the University to assist foreign students in all matters pertaining to their attendance at the University. Every student from another country is urged, upon his arrival at the University, to consult Mr. Allen C. Blaisdell, Foreign Student Adviser, International House.

LATE ADMISSION AND REGISTRATION

The student or prospective student should consult the University calendar and acquaint himself with the dates upon which students are expected to register and begin their work at the opening of the sessions. Failure to register upon the stated registration days is certain to cause difficulty in the making of a satisfactory program and to retard the progress both of the student himself and of each class to which he may be admitted.

A student who registers after the opening of the session and who later is found to be deficient in his work may not plead late admission as an excuse for his deficiency.

A fee of \$2 is charged for late registration; this fee applies both to old and new students.

A qualified student or applicant who fails to register upon the stated registration days at the opening of the session, but who, nevertheless, appears *during the first two weeks of instruction*, will usually be permitted to register. After the first week, however, he is required to obtain the written approval of all the instructors in charge of his proposed courses and of the dean of his college, before his registration can be completed.

ADMISSION IN GRADUATE STANDING

Holders of bachelors' degrees from institutions on the Accepted List of the Association of American Universities conferred in or after the year indicated, representing the usual college course of four years, may, provided their scholarship record be satisfactory, be admitted to the Graduate Division, Northern Section, of the University of California upon presentation of official transcripts of record covering all college or university work completed to date together with official evidence of the degree conferred, with the proviso that the University of California may deny admission to graduate standing in cases where the undergraduate program has not been of such character as to furnish an adequate basis for advanced work leading to academic or professional higher degrees or certificates. This applies to colleges and schools within the University of California as well as to those outside, e.g., Pharmacy, Nursing, etc. *In the absence of official records and official evidence of graduation or receipt of degree, registration will not in any case be permitted.*

Transcripts of students' records and all other official credentials are retained permanently in the files of the office of the Dean of the Graduate Division. The student must have an official transcript of his record (in addition to the record sent to the Dean of the Graduate Division) in his possession for conference with departmental advisers and for his own reference in planning a program of study. The Graduate Division office copy may not be lent. Admission to the Graduate Division does not necessarily carry with it the privilege of proceeding to candidacy for a higher degree on the basis of minimum residence and subject requirements.

The admission of applicants from institutions not on the Accepted List of the Association of American Universities is determined according to the conditions described in the preceding paragraph, except that a detailed evaluation of credentials must normally be made and therefore a longer time may be necessary for action. The fact that an institution does not appear on the Accepted List should not be construed as disapproval of the institution, but

in general is accounted for by lack of definite information. The list serves administrative purposes, primarily to facilitate prompt registration.

A formal application is required of all persons seeking admission to the Graduate Division, Northern Section, of the University of California. The application blank may be obtained by addressing the Dean of the Graduate Division, 102 Administration Building, University of California, Berkeley 4, and must be filed at the office of the Dean of the Graduate Division, preferably eight weeks prior to the date of registration; it should be accompanied by a money order or bank draft for \$5 in payment of the application fee.† *Please note that the application fee is chargeable to every person who files an application, and it not returnable under any circumstances.* For readmission of former graduate students see below. In cases where applications and complete records are filed later than eight weeks before the date of registration, it is possible that the student's registration may be delayed, thus making him liable for the late registration fee of \$2.

With the application for admission of every new student, there must be filed a certificate showing successful vaccination against smallpox within the last seven years.** A form for this purpose will be furnished by the University.

Applicants for admission to the graduate years of the Medical School should file their credentials with the University Admissions Director, accompanied by a money order or bank draft for \$5 in payment of the application fee.†

Applicants for admission to graduate work at the College of Agriculture at Davis, the Lick Observatory on Mount Hamilton, the Hooper Foundation and the College of Dentistry in San Francisco must first secure admission to the Graduate Division and authorization to pursue such work through the Dean of the Graduate Division, Northern Section.

An application for readmission is required of persons formerly registered in a regular session as graduate students who wish to return after an absence. The form for this purpose is obtainable from the Registrar. No fee is charged. Each applicant is required, however, to file a vaccination certificate.

The level of work to which graduate students are assigned, and their standing as candidates for degrees, depends upon the extent and character of their undergraduate courses. If in any department the preliminary training of an applicant has not been sufficient to qualify him for graduate work he may be admitted to such undergraduate courses as may be suited to his needs.

Applicants for admission to the Graduate Division on credentials from universities and colleges in foreign countries are required to appear for the Examination in English for Foreign Students described in the preceding section, to demonstrate whether or not their command of English is sufficient to permit them to profit by instruction in this University.

After admission to the Graduate Division every graduate student is required

† Veterans who expect to enroll under the provisions of Public Law 846 (the G. I. Bill of Rights), or Public Law 16, are not required to remit this fee with their applications.

** Veterans of World War II need not file a certificate until after 1950.

to file with the Registrar on a specified date a study list containing his program of courses or statement of other graduate work, including thesis and research, approved by the graduate adviser in the department of his major subject, or in case of candidates for the Ph.D. degree, by the chairman of the committee in charge of candidacy. Study-list changes for graduate students are subject to the regulations applying to undergraduates.

For further information concerning all matters pertaining to the Graduate Division at Berkeley, see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be obtained from the Dean of the Graduate Division, University of California, Berkeley 4.

For regulations concerning graduate study at Los Angeles consult the ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION, which may be obtained upon request from the Dean of the Graduate Division, University of California, Los Angeles 24.

GENERAL REGULATIONS

CERTAIN GENERAL REGULATIONS govern residence and study in the academic departments. These regulations, unless otherwise stated, concern both graduate and undergraduate students.

ROUTINE OF REGISTRATION

No student in the departments of the University at Berkeley may undertake any work or examination with a view to credit toward a University degree without registration for the work or examination with the Registrar; such registration must be accepted by the proper faculty before the work proposed is undertaken.

Students of good standing carrying a limited amount of regular classwork may be permitted, on the basis of private study outside of University classes, to take certain University examinations for the purpose of gaining advanced standing, but the authorization of the proper faculty must be obtained by written petition before preparation for the examinations is begun.

All students must register with the Registrar their choice of courses to be pursued in any semester, on blanks provided for the purpose, at the time and place designated. Registration at a later date requires special permission. For further information, see under Late Admission and Registration, page 32.

Students in year courses must register with the Registrar for these courses at the beginning of each semester. They are sometimes permitted to register for year courses in the second semester without having been registered in the first semester. When this is done, credit is given for the work of the second semester only.

No person will be admitted as a student to any course, except as authorized by the official certificate of registration and duplicate study card supplied to each student by the Registrar, subject to the approval of the appropriate study-list officer.

Concurrent enrollment in resident courses and in extension courses 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 registered with the Registrar before the work is undertaken.

After the study cards are filed, students may make changes in their programs by formal petition, which must be approved by the instructors concerned and by the dean or other proper officer of the student's college.

Every regular student must include in his study list all required work appropriate to the college and year of his course. (The rules governing the choice of studies of regular students are stated in the description of the curricula of the several colleges.) The Committee on Study Lists of each college is authorized to withdraw study cards that do not show compliance with this regulation.

The names of students who fail to comply with the regulations governing registration will not appear on the official class rolls.

MEDICAL AND PHYSICAL EXAMINATION

All new students (graduate and undergraduate), just after filing their registration papers, must appear before the University Medical Examiners and pass a medical and physical examination, to the end that the health of the University community, as well as of the individual student, may be safeguarded. Every new student (graduate and undergraduate) entering the University must include with his application for admission a certificate testifying to successful vaccination against smallpox within the last seven years. A form for this purpose is furnished by the University. Tests for tuberculosis are a part of the examination of all new students. Applicants for admission who have contagious diseases will be excluded. Those having physical conditions, such as convulsive seizures, which grossly disturb the classwork of other students, should not apply for admission.

Before coming to the University, every student is urged to have his own physician examine him for fitness to carry on University work, and to have all defects capable of remedial treatment, such as diseased tonsils or imperfect eyesight, corrected. This will prevent possible loss of time from studies.

STUDENT HEALTH SERVICE

The purpose of the Student Health Service is to conserve the time of students for their classwork and studies, by preventing and treating acute illnesses. This service is made possible by the general funds of the University and in part by the staff physicians, and is not a health insurance plan; therefore, the services are limited by the staff and facilities available.

Each registered student at Berkeley may, at need, have such consultations and medical care on the campus as the Ernest V. Cowell Memorial Hospital is staffed and equipped to provide, from the time of payment of his registration fee to the last day of the current semester or the date of official withdrawal from the University. Surgical treatment is also included in the services offered when, in the opinion of the University Physician, this service is necessary and within the limitations herein outlined.

During the semester hospital care for a period up to thirty days may be given in the event of serious illness, on the recommendation of the University Physician. If at the end of the semester the patient is still ill he will be released from the hospital to the care of his home or community as soon as the University Physician considers it safe. Also, if injuries or illnesses are of a nature requiring long continued care which will obviously prevent the continuance in college in the current semester the patient will be returned to his community or home for definitive treatment. No surgical diagnostic procedures will be done (for example, tumors of the bone) where the procedure will prevent the student from returning to college the same semester or which may of necessity have to be followed by immediate definitive treatment where the student may

not be returned to college. Charges will be made for unusual appliances or remedies not ordinarily available or for hospitalization in excess of thirty days.

The Health Service does not take responsibility for any chronic physical defects or illnesses present at the time of entrance to the University (for example, hernias, chronic bone and joint diseases or deformities, chronic gastrointestinal disorders, fibroids of the uterus, chronically infected tonsils, tuberculosis, syphilis, malignant diseases, allergic and endocrine disorders, etc.). Furthermore, it does not take responsibility for any injury or illness wherein treatment has been initiated elsewhere, with the exception of first aid and emergency care. It does not take responsibility for remedial defects where medical or surgical treatment is elective and not of an emergency nature, and where the best interests of the student will be served by treatment during vacation.

Dental service for diagnosis and emergencies (such as fractures) is provided. A limited amount of general dentistry is available and will be charged for in accordance with a schedule of rates approved by the President of the University.

PHYSICAL EDUCATION AND USE OF GYMNASIUMS

Men.—All men students are required, at the time of first registration in the University, to present themselves at the Department of Physical Education, Gymnasium for Men, for an interview and appraisal regarding their fitness for participation in physical training exercises and athletic sports. On the basis of this examination each student will be informed concerning the opportunities available to him in organized courses of the department, in athletic sports, and in other recreational activities. The use of the Gymnasium for Men, including the swimming pool, is open to all men students of the University.

Women.—The Hearst Gymnasium rooms, courts, swimming pools, sports fields, and equipment for games and sports, are available to all women students of the University who wish an opportunity for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit. The Women's Athletic Association and the Department of Physical Education cooperate in furthering opportunities for a wide variety of activities. Further information may be obtained from the Secretary, Room 200, Hearst Gymnasium.

SUBJECT A: ENGLISH COMPOSITION

With the exceptions noted below, every undergraduate entrant must, at the time of his first registration in the University, take an examination known as the *Examination in Subject A*, designed to test his ability to write English without gross errors in spelling, grammar, sentence structure, and punctuation.

The examination in Subject A is given at the opening of the fall and spring semesters (see the REGISTRATION CIRCULAR, to be obtained from the Registrar), and at the opening of each of the Summer Sessions. A second examination for

late entrants is given not later than two weeks after the first examination in each semester; for this examination a fee of \$1 is charged.

The results of the first examination will be made known not later than the day preceding the date set for the filing of study cards for the current semester. Papers submitted in the examination are rated as either "passed" or "not passed." A student who is not present at the examination in Subject A which he is required to take will be treated as one who has failed. Every student who does not pass in the examination in Subject A must, immediately after his failure, enroll in a course of instruction, three hours weekly for one semester, 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 semester 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 given credit for Subject A.

Every student who is required to take the course in Subject A is charged a fee of \$20, and the charge will be repeated each time he takes the course. This fee must be paid before the study list is filed.

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

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

A student who has received a satisfactory rating in the College Entrance Examination Board examination in English composition will receive credit for Subject A. A student who has passed an examination in Subject A given by the University at Los Angeles or given under the jurisdiction of the University at various centers in the State annually in May or June will receive credit for Subject A.

A student who, at any time, has failed in the University examination in Subject A does not have the privilege of taking a second examination until he has completed the course in Subject A.

A student who enters the University of California with credentials showing the completion elsewhere with a grade not lower than C of one or more college courses in English composition (with or without unit credit) is exempt from the requirement in Subject A.

AMERICAN HISTORY AND INSTITUTIONS

All students who are candidates for the bachelor's degree must demonstrate a knowledge of American History and Institutions and may meet the requirement in the following ways:

1. By passing a single examination in American History and Institutions. The passing of this examination will not entitle the student to receive unit credit.

General Regulations

2. By completing any two of the following courses, subject to the conditions noted below: † American Institutions 101 (Summer Session), or XB7ABC* or X7AB* (University Extension); Business Administration 153 (not included in Letters and Science List of Courses); Economics 113, 152; History 17A*, 17B*, or XB17A*, XB17B* (University Extension), 167A, 167B, 172A*, 172B*, 173A, 173B, 174A, 174B, 176A, 176B, 187A, 187B; Political Science 1, XB1 (University Extension), 113*, 115, 128, 140, 150, 151*, 152, 154, 155, 157A, 157B, 159, 162, 172, 175, 182; Speech 137.

Any one of the above courses offered in the Summer Sessions is acceptable.

3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California in those cases where an official transcript of record from such an institution indicates satisfaction of the requirement by such courses. (Candidates for the teacher's credential, if they are satisfying the requirement by course work, must take at least one course in American government within the State of California.)
- (b) By presenting a certificate of completion of acceptable courses at other collegiate institutions. Certificates may be obtained from the office of the Supervisor.

All foreign students in attendance at the University of California on student visas, who are candidates for the bachelor's degree, are advised to see the Supervisor of the American History and Institutions Requirement early in their academic work at the University.

Further information regarding this requirement, and examination necessary to meet it, may be obtained from the Supervisor of the Requirement of American History and Institutions, Room 208, Building T-9. For office hours, see official announcements on campus bulletin boards.

MILITARY SCIENCE

Under the Act of Congress establishing the land-grant colleges, it is required that instruction in military science be included in the curricula. The Board of Regents of the University of California has therefore directed that every undergraduate male student must pursue the study of military science during the first two years of residence, in accordance with instructions contained in the CIRCULAR FOR NEW UNDERGRADUATES or the announcements which may be posted on the University bulletin boards.

Students must list the prescribed courses in military science on their study cards with other University courses. A petition for excuse from, or deferment of, military science must be filed within two weeks of the date of registration.

† Students taking these courses are subject to the regular rules which apply for prerequisites and majors. Upper division history courses may be taken to satisfy the requirement only with the permission of the instructor.

* Course acceptable for satisfaction of requirement for teacher's credential.

Exception will be made where illness or physical disability occurs after that date. Further information about the requirement in military science, including statements of the grounds upon which students may be excused from this work, may be obtained from the Registrar.

If a student subject to this requirement lists the prescribed course on his study card, and thereafter without authority fails to appear for work in the course, his neglect will be reported to the Registrar, who, with the approval of the President, will notify the student that he is dismissed from the University. The Registrar will then inform the dean of the student's college or other officer in charge of the student's program of his dismissal. Reinstatement will be made only upon approval of the President of the University with the concurrence of the Professor of Military Science and Tactics.

The Reserve Officers Training Corps

The Reserve Officers Training Corps was established by Act of Congress in 1916. Its mission is to train junior officers possessing qualities and attributes essential to their progressive and continued development in the Officers Reserve Corps of the Army of the United States and in the Regular Army. Military leadership is emphasized, with instruction being given in subjects common to all branches of the Army and in tactics and technique of the several branches. The University of California has a unit of the Reserve Officers Training Corps, in which instruction by Army officers is offered in eight branches of the service. Instruction is presently offered in the tactics and technique of Infantry, Corps of Engineers, Signal Corps, Artillery, Ordnance, Quartermaster Corps, Transportation Corps, and Corps of Military Police. The United States Government furnishes arms, equipment, uniforms, and textbooks for the use of all students enrolled in courses of the department. The R.O.T.C. program consists of two parts: 1) the required basic course, and 2) the elective advanced course and summer camp.

The lower division (basic) course is prescribed for all first-year and second-year undergraduate male students who are not otherwise exempt. The instruction is of a general type, applicable to the Army as a whole, during the first year. In the second year, students elect one of eight branches of the Army, in which they receive a specialized introductory course in the branch selected.

The upper division (advanced) course is open to enrollment by students who successfully complete the basic course or who have received credit in lieu thereof. In general, students selected for this course are those who have shown potentialities for leadership and command, and whose aptitude insures their developing into efficient officer material. Successful completion of the advanced R.O.T.C. course, and four years of education at the college level qualifies the student for appointment as a Second Lieutenant in the Army of the United States. Students who complete the advanced course are also eligible to be commissioned by the Governor of the State of California in the University Cadets.

NAVAL SCIENCE

Candidates for enrollment in the Naval Reserve Officers' Training Corps will be selected by the Professor of Naval Science. These candidates are in addition to candidates entering from the competitive nation-wide aptitude test, and will be accepted to the limit of the quota as established by the Navy Department. Applications will be accepted from entering students and from other students who have met the military science requirement of the University and who will have a minimum of eight semesters of college work remaining on this campus, in the undergraduate and/or graduate field. The curriculum of the Naval Science Department includes 24 units of naval science studies in eight semesters; one course being taken each semester. In the case of engineering students, Mechanical Engineering 128A-128B (conducted jointly by the departments of Engineering and Naval Science) will satisfy the requirements for Naval Science 102A-102B normally taken during the seventh and eighth semesters of the naval science curriculum. In addition, two hours of military drill or practical work per week are required each semester. Students are not accepted for a period shorter than eight semesters. Upon successful completion of 24 units of naval science, and all other requirements for a first bachelor's degree in any field of study, graduating students are given officers' commissions in the U. S. Naval Reserve or Marine Corps Reserve. Upon selection, and agreement to serve for a two-year period of active duty, graduating students may be granted commissions in the regular Navy or Marine Corps. In addition to the other course requirements, Naval R.O.T.C. students must complete one year of college physics, including laboratory work, and mathematics courses through trigonometry by the end of the sophomore year; sufficient courses in English to achieve a proficiency in written and oral expression; and such instruction in swimming as is necessary to enable qualification as a Navy first-class swimmer. Candidates must contract to fulfill all the requirements of the four-year Naval R.O.T.C. curriculum, without serious interference with or from other academic work required for the bachelor's degree. Certain monetary advantages accrue to Naval R.O.T.C. students during their third and fourth years in the program.

For further information about the Naval R.O.T.C., consult the Professor of Naval Science in Room 47, Gymnasium for Men.

STUDY-LIST REGULATIONS

At the beginning of each semester every student is required to file with the Registrar, upon a date to be fixed by the Registrar, a detailed study list bearing the approval of a faculty adviser or other specified authority.

The presentation of a study list by a student and its acceptance by the college is evidence of an obligation on the part of the student to perform faithfully the designated work to the best of his ability. Withdrawal from,

or neglect of, any course entered on the study list, or a change in program without the formal permission of the dean of the college, makes the student liable to enforced withdrawal from the University, or to other appropriate disciplinary action.

The various colleges observe certain study-list limits with which the student must comply. For detailed regulations, see the announcements of the respective colleges in later pages of this bulletin.

Authority of instructors.—No student will be permitted to enter upon the study of any subject if, in the opinion of the instructor, he lacks the necessary preparation to insure competent work.

Every student is required to satisfy the instructor in each of his courses of study, in such ways as the instructor may determine, that he is performing the work of the course in a systematic manner. Instructors will report to the President from time to time the names of students whose attendance or work is unsatisfactory.

Any instructor, with the approval of the President, may at any time exclude from his course any student guilty of unbecoming conduct toward the instructor or any member of the class, or any student who, in his judgment, has neglected the work of the course. A student thus excluded will be recorded as having failed in the course of study from which he is excluded, unless the faculty determines otherwise.

Other general requirements.—The attention of the student is directed to further University regulations concerning the requirements in scholarship, and for candidacy for degrees.

CANDIDACY FOR DEGREES

Every student who intends to become a candidate for a bachelor's degree or the degree of Associate in Arts must file with the Registrar, on a date to be fixed by the Registrar, an announcement of candidacy for the degree. For filing this announcement later than the appointed date, a fee of \$2 is charged. In 1949-1950 these dates are: Thursday, September 29, for candidates who except to complete their work in February, 1950, and Thursday, February 23, for candidates for graduation in June, 1950.

All candidates for the bachelor's degree are required to have been enrolled throughout the senior or final year of residence in that college of the University in which the degree is to be taken. This regulation applies both to students entering this University from other institutions and to students transferring from one college to another within this University. Of the 120 (or more) units required for the bachelor's degree, at least 24 units must have been completed at this University in resident courses of instruction taken in the final or senior year.

All graduates of any one calendar year—January 1 to December 31—are considered as belonging to the "class" of that year.

CHANGE OF COLLEGE OR MAJOR

A student may be transferred from one college (major or department) of the University to another upon the approval of the dean or other responsible officer or committee of the college (or department) to which admission is sought. A form of petition for transfer is supplied by the Registrar.

No student is permitted to transfer from one major department to another after the opening of the last semester of his senior year.

HONORS

Honor students include those who receive honorable mention with the degree of Associate in Arts in the College of Letters and Science, or upon attaining junior standing in the colleges of Agriculture, Chemistry, and Engineering, or in the schools of Architecture, Business Administration, Forestry, Nursing, Optometry, and Public Health. Honors are granted also with the bachelor's degrees. For regulations concerning honors see the sections explanatory of the curricula of the various colleges, in later pages of this bulletin.

CREDIT AND SCHOLARSHIP

In both the University and the high school the student is credited, in respect to amount of work accomplished, in terms of units; and in respect to quality of scholarship, in terms of grades. In a further, more exact determination of the student's scholarship, the University assigns a numerical value in points to each scholarship grade. These points are called grade points and are more fully described below.

High school credit, when it is offered in application for admission to the University, is reckoned in matriculation units; one matriculation unit represents one year's work in a given subject in the high school.

High school credit, when it is offered in satisfaction of high school graduation requirements, is measured in standard secondary units; that is, the credit granted for the study of a subject throughout the school year of from thirty-six to forty weeks is stated in terms of the standard secondary unit. Each unit represents approximately one-quarter of a full year's work in high school; in other words, four standard secondary units represent one full year's work in high school.

Relation between high school matriculation units and University units.—One year's work in the high school is considered to be equivalent to one University semester's work of college level; that is, a student who desires to make up any high school subject deficiency by offering work of college level can in one University semester earn credit equivalent to the credit of one year's work in high school.

The value of a course in units is reckoned at the rate of one unit for three hours' work per week per semester on the part of the student. The credit value

assigned to a course is not determined by the number of class meetings per week, but by the number of hours of work required of the student. For most courses it is expected that the average student will spend two hours in preparation for one hour of lecture or recitation.

GRADES OF SCHOLARSHIP; GRADE POINTS

In the University (except in the College of Dentistry and in the Medical School in San Francisco), the result of the student's work in each course (graduate and undergraduate, including courses in which credit is sought by examination) is reported to the Registrar in one of six scholarship grades, four of which are passing, as follows: A, excellent; B, good; C, fair; D, barely passing; E and F, not passing. Grades are not otherwise defined, as for example, by percentages, or by a rule stipulating the manner in which the several grades shall be distributed.

Grade E (not passed) or grade X (not passed), used prior to July 1, 1944, indicates a record below passing, but one which may be raised to a passing grade without repetition of the course by passing a further examination or by performing other tasks required by the instructor. Grade F (not passed) denotes a record so poor that it may be raised to a passing grade only by repeating the course.

The term "incomplete" is not used in reporting the work of students. The instructor is required to assign, for every student, a definite grade based upon the work actually accomplished, irrespective of the circumstances which may have contributed to the results achieved.

Course reports filed by instructors at the end of each semester are final, not provisional.

Grade points are assigned to the respective scholarship grades as follows: for each unit of credit, the scholarship grade A is assigned 3 points; B, 2 points; C, 1 point; D, E, and F, no points.

In order to qualify for the degree of Associate in Arts in the College of Letters and Science, or for the bachelor's degree in the College of Letters and Science, the College of Agriculture, the College of Chemistry, or the College of Pharmacy, in the School of Architecture, the School of Business Administration, the School of Forestry, the School of Nursing, the School of Optometry, or the School of Public Health, the student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him in the University of California. For the bachelor's degree in the College of Engineering, the student must have obtained at least as many grade points as there are units in the credit value of all courses undertaken by him in the University in and after January, 1930.

In the College of Dentistry, the student's work is reported, in reference to each course, as "passed" or "not passed." The faculty of this College determines the conditions under which a grade of "not passed" may be raised to

a grade of "passed." For the bachelor's degree in the College of Dentistry, or for the degree of D.D.S., the student must have obtained a grade of "passed" in every course in which he has been enrolled in that College in and after July 1, 1942.

For the grading system in the Medical School, see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

Every student who desires to obtain his scholarship grades at the end of the semester should deposit with the Registrar a self-addressed stamped envelope for a report of the grades.

MINIMUM SCHOLARSHIP REQUIREMENTS

Any student who receives a notice of dismissal from the University may petition the dean of his college or school for a hearing. Ordinarily, however, students dismissed for unsatisfactory scholarship will be excluded from the University for an indefinite period, with the presumption that their connection with the University will be ended by such exclusion. The conditions under which students may be dismissed follow:

Colleges of Letters and Science, Agriculture (Berkeley), Chemistry, and Pharmacy; also Schools of Architecture, Business Administration, Forestry, Nursing, and Public Health—

Probation.—A student will be placed on probation

- (1) If at the close of his first semester his record shows a total deficiency of six or more grade points; or
- (2) If at the close of any subsequent semester his grade-point average is less than one (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

Dismissal.—A student will be subject to dismissal from the University

- (1) If during any semester he fails to pass with a grade of C or higher courses totaling at least 4 units; or
- (2) If while on probation his grade-point average for the work undertaken during any semester falls below one (a C average); or
- (3) If after two semesters of probationary status he has not obtained a grade-point average of one (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

Students in the School of Nursing may, at the discretion of the Faculty of the School of Nursing, be placed on probation or made subject to dismissal for deficiencies in qualification for their profession other than those listed above.

A student who becomes subject to the provisions of this regulation will also be subject to such supervision as the faculty of his college or school may determine. The faculty may dismiss from the University students under its supervision or may suspend the provisions of this regulation and permit the retention

in the University of the students subject to dismissal, and the return to the University of students who have been dismissed under this regulation.

College of Engineering—

A student will be subject to dismissal from the University (A) if during any semester he fails to pass with a grade of C or higher courses totaling at least 4 units; or (B) if at the end of any semester he has failed to attain at least a C average in all courses undertaken in the University. A student who becomes subject to the provisions of this regulation will be under the supervision of the Faculty of the College. The Faculty of the College may dismiss from the University students under its supervision, or may suspend the provisions of this regulation and permit the retention in the University of the students thus subject to dismissal, and the return to the University of students who have been dismissed under this regulation.

School of Optometry—

Probation.—A student will be placed on probation if at the close of his first semester in the School of Optometry his record falls below a C average.

Dismissal.—A student will be subject to dismissal from the University

(1) If at the end of any semester subsequent to his first, he has failed to maintain a grade-point average of one (a C average), computed on the total of all courses taken subsequent to his admission to the School of Optometry for which he has received a final report; or

(2) If during any semester he fails to pass with a grade of C or higher courses totaling at least 4 units.

A student in the School of Optometry who becomes subject to the provisions of this regulation will be under the supervision of the Faculty of the School. The faculty may dismiss from the University students under its supervision, or at its discretion may suspend the provisions of this regulation and permit the retention in the University of the students thus subject to dismissal, and the return to the University of students who have been dismissed under this regulation.

Graduate Division—

The action to be taken in respect to students in graduate status who acquire scholarship deficiencies is left to the discretion of the Dean of the Graduate Division.

Medical School—

Matriculants in the Medical School who are pursuing all their work in that school are not subject to the foregoing regulations. For the rules governing scholarship requirements in the Medical School, reference should be made to **the ANNOUNCEMENT OF THE MEDICAL SCHOOL.**

CREDIT BY EXAMINATION

Provision is made whereby an undergraduate student in residence and in good standing may under certain conditions take examinations for degree credit either (a) in courses offered in the University, without formal enrollment in them, or (b) in subjects appropriate to the student's curriculum, but not offered as courses by the University. The results of all such examinations, with grades and grade points, are entered upon the student's record in the same manner as for regular courses of instruction (see Grades of Scholarship, page 45). No fees are required.

The privilege of taking an examination for credit will ordinarily be granted only to students who have at least a B average for all courses undertaken in the University.

Arrangements must be made in advance with the dean of the student's college or school; his approval, and that of the instructor who is appointed to give the examination, are necessary before an examination can be given.

The application form for examinations may be obtained from the Registrar.

FINAL EXAMINATIONS

Final examinations are obligatory in most undergraduate courses. Each course in which a final examination is not required is so indicated in the SCHEDULE OF CLASSES at the beginning of the semester in which the course is given. All examinations will, so far as practicable, be conducted in writing, and a maximum time will be assigned beforehand for each examination, which no student will be allowed to exceed. The time for examination sessions will not be more than three hours. Leave to be absent from a final examination must be sought by written petition to the proper faculty.

If a final examination is one of the regular requirements in a course, there can be no individual exemption from the examination, except as provided in the preceding paragraph.

Any department may examine a student, at the end of the semester immediately preceding his graduation, in the major subject in which the department has given instruction; and a student to be examined in a major subject may, at the discretion of the department, be excused from all final examinations in courses in the department of the major subject in which he has been enrolled during the semester. Credit value may be assigned to this general examination in the major subject.

In the year courses of the professional curriculum in jurisprudence, mid-year reports may be made without formal examinations, and these reports will be final.

Reexaminations are permitted only for the purpose of raising grade E or X (not passed) to a passing grade. In the courses of the Summer Sessions, however, the University does not provide reexaminations. A student who received

grade B, C, or D in any course is not allowed a reëxamination for the purpose of raising the grade. Concerning methods of raising nonpassing grades to passing grades, see under Removal of Deficiencies, below.

Application for examination for advanced standing on the basis of work done before entrance to the University should be made to the University Admissions Director upon entrance to the University.

REMOVAL OF DEFICIENCIES

NOTE.—In this section whenever reference is made to removal of grade E (not passed), the statement applies also to grade X (not passed), used prior to July 1, 1944.

A student who receives a grade lower than C in a lower division course may, upon repetition of the course, receive the grade assigned by the instructor and grade points appropriate to that grade. The foregoing privilege does not apply to grades received in upper division or graduate courses. A student who receives grade E or F in an upper division or graduate course may, upon successful repetition of the course, receive unit credit for the number of units passed, but ordinarily will not receive grade points. (For exceptions, see below.)

Special provision is made for students whose university work has been interrupted by one year or more of service with the armed forces of the United States and who, prior to such service, had undertaken one or more courses forming part of an announced sequence of courses. Such a student may, with the approval of the dean of his college or school (or, in the case of graduate students, with the approval of the Dean of the Graduate Division), be permitted to repeat any course previously undertaken in the sequence, irrespective of the grade previously assigned, and to receive the new grade assigned by the instructor and grade points appropriate thereto; provided, however, that for a course so repeated the student may receive unit credit toward graduation, or toward the satisfaction of major requirements, only in an amount not to exceed the difference between the full unit value of the course and the number of units, if any, which he has previously received from the same course.

For the purpose of raising grade E to a passing grade the student may, with the consent of the instructor concerned and of the dean or director of the appropriate school, college, or division, have the privilege of a "condition examination." In Summer Sessions courses, however, reëxaminations for the removal of deficiencies are not provided by the University.

Any examination, term paper, or other exercise which the instructor may require of the student in order to raise grade E to a passing grade in a course is a "condition examination." For every such examination a formal permit, to be obtained in advance from the Registrar, must be shown to the instructor in charge of the examination; otherwise he will lack authority to consider and report upon the work submitted by the student. For every course in which a special examination is undertaken with a view to raising grade E to a passing grade, a fee of \$2 is charged. The fee for a permit for two or more special

examinations of this type is \$3. There is no fee for a reëxamination (final examination taken with the class), if the final examination is the only task required by the instructor for the purpose of raising grade E to a passing grade and if this final examination is taken with the class not later than the close of the next succeeding semester of the student's residence in which the course is offered. A form of petition for a special examination or for admission to an examination with a class, with instructions concerning procedure, may be obtained from the Registrar. Grade E in a course in which a final examination is regularly held can be raised to a passing grade only by passing a satisfactory final examination in the course.

If a student who has received grade E in any course fails to raise it to a passing grade by the end of the next semester of his residence in which the course is regularly given, then the grade shall be changed to F. If in the meantime, however, the student has repeated the course and has again received grade E, his grade in the course will remain grade E, as it would be if he were taking the course for the first time. A student who fails to attain grade D or a higher grade in any course following a reëxamination for the purpose of raising grade E to a passing grade, will be recorded as having received grade F in the course.

A student who raises a grade E or F, incurred in an upper division or graduate course, to a passing grade by *successful repetition* of the course, and a student who raises a grade E, incurred in any course, lower division, upper division, or graduate, to a passing grade by *examination* or by performing other tasks required by the instructor (short of actual repetition of the course), shall ordinarily receive no grade points. An exception to this rule is permitted, however, when the deficiency consists solely in the *omission* of the final examination or other required exercise on account of illness or other unavoidable circumstances, the student's performance in all other respects having been satisfactory. In such circumstances the student may petition to have that grade assigned which he would have received had the work been completed without delay, together with the appropriate number of grade points. His petition must set forth in detail the reasons for his failure to complete the course within the usual limit of time. The petition must be endorsed by the instructor concerned, and must be submitted for final approval as follows: by undergraduate students (except students in the College of Pharmacy), to the Dean of Students; by students in the College of Pharmacy, to the Dean of that College; by graduate students, to the Dean of the Graduate Division.

TRANSCRIPT OF RECORD

Each student will be provided, upon request to the Registrar, with one official transcript (copy) of his University record, without charge. After the first request a minimum charge of one dollar is made for each additional transcript of record. Students who plan to enter the teaching profession or to seek other

employment following graduation, should provide themselves with one or more transcripts of their records so as to be ready at all times to show official evidence of attendance at the University.

Application for a transcript of record should be made directly to the Registrar well in advance of the time when the record will be needed by the applicant.

LEAVE OF ABSENCE AND HONORABLE DISMISSAL

A brief leave of absence, to expire on a definite date, may be issued to a student in good standing who finds it necessary to withdraw for a short time, but who wishes to retain his status in his classes and to resume his work before the close of the current semester. No excuse for absence will relieve the student from the necessity of completing all the work of each course to the satisfaction of the instructor in charge. Petition forms for leaves of absence, with complete instructions, may be obtained at the office of the Registrar.

A student must apply for leave to be absent from or excuse for having been absent from any college exercise other than a final examination, to the instructor in charge of the exercise; unless, for unavoidable cause, the student is obliged to absent himself from all college exercises for several days, in which event he should apply for a brief leave of absence as directed above. Leave to be absent from a final examination must be sought by written petition to the proper faculty.

An *honorable dismissal* or an *indefinite leave of absence* may, upon petition, be issued to any student in good standing provided he complies with the instructions on the form of petition, which may be obtained from the Registrar.

A student is in good standing if he is entitled to enjoy the normal privileges of a student in the status in which he is officially registered. Students dismissed by reason of scholarship deficiencies, students on probation, students under censure, and students under suspension are not regarded as students in good standing.

Discontinuance without notice. Students who discontinue their work without formal leave of absence do so at the risk of having their registration privileges curtailed or entirely withdrawn.

DISCIPLINE

When a student enters the University it is taken for granted by the University authorities that he has an earnest purpose and that his conduct will bear out this presumption. If, however, he should be guilty of unbecoming behavior or should neglect his academic duties, the University authorities will take such action as, in their opinion, his conduct warrants. Students who fail to make proper use of the opportunities freely given to them by the University must expect to have their privileges curtailed or withdrawn.

Administration.—By authority of the Academic Senate, the President of the University is entrusted with the administration of student discipline with full

power to act. He accomplishes this through the assistance of his teaching staff, the administrative officers concerned with student welfare, and the Faculty-Administration Committee on Student Discipline under the chairmanship of the Dean of Students.

Degrees of discipline.—There are five degrees of discipline: warning, censure, suspension, dismissal, and expulsion. Censure indicates that the student is in danger of exclusion from the University. Suspension is exclusion from the University for a definite period. Dismissal is exclusion for an indefinite period, with the presumption that the student's connection with the University will be ended by it. Expulsion is the most severe academic penalty, and is final exclusion of the student from the University.

Student self-government.—The Men's and Women's Judicial Committees of the Associated Students advise the Faculty-Administration Committee on Student Discipline regarding student views on conduct, penalties, and procedures, and recommend measures conducive to the improvement of student conduct. They are responsible for developing a program for creating among the students attitudes and opinions favorable to good conduct.

Rules for women students, particularly with respect to good conduct in living groups, have been established by the Women's Executive Board of the Associated Students. Discipline for infractions of these regulations is administered by the Women's Judicial Committee of the Associated Students with the help and advice of the Dean of Women.

MISCELLANEOUS INFORMATION
CLIMATE—EXPENSES—LIVING ACCOMMODATIONS
EMPLOYMENT—SCHOLARSHIPS—LOANS

Site, Climate, and Transportation

THE BERKELEY CAMPUS of the University of California is situated on the eastern shore of San Francisco Bay, directly opposite the Golden Gate. The University grounds comprise five hundred and thirty acres, rising in gentle slopes to the Berkeley hills. From almost every part of the campus—and the city of Berkeley—there is a magnificent outlook over the bay and city of San Francisco, the neighboring plains and mountains, the Pacific Ocean, and the Golden Gate.

Berkeley has a climate well suited for university work throughout the year. Extremes of heat and cold, such as are experienced in many other parts of the country, are unknown in Berkeley. The average temperature for the winter months is about 53 degrees; for the months of May, June, and July, about 60 degrees. Temperatures as high as 85 degrees are of infrequent occurrence and brief duration.

The average rainfall is 24 inches, of which about three-fourths comes in the four months, December to March, when approximately one day out of three is rainy. Throughout the rest of the school year on an average one-fifth of the days are rainy. In the rainy season fogs are infrequent. Fully half the foggy days of the year come in the summer months.

From the business center of Oakland, it is about thirty minutes' ride by bus to the University, and from San Francisco about thirty-five minutes by electric train. Motorists from San Francisco may come by way of the San Francisco-Oakland Bay Bridge.

EXPENSES OF STUDENTS

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 expenditure. In a student body of more than twenty 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 that he will in all probability have to provide for.

A table of estimated minimum, moderate, and liberal budgets for a college year of two semesters for a student who will enroll in a nonpreprofessional or nonprofessional course and who has been classified as a resident of the State is given below.

Incidental fee.—The incidental fee is \$35 each semester, for both undergraduate and graduate students. This fee, which must be paid at the time of registration, covers certain expenses of students for use of laboratories, library books, for athletic and gymnasium facilities and equipment, for lockers, for registration and graduation, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service with the aid of the visiting staff at Cowell Memorial Hospital and not elsewhere. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges. If a student

PRINCIPAL ITEMS OF EXPENSE ESTIMATED FOR A COLLEGE YEAR

Expense Items	Minimum		Moderate		Liberal	
	Men	Women	Men	Women	Men	Women
Incidental Fee.....	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00
Books and Supplies.....	35.00	35.00	43.00	43.00	50.00	50.00
A.S.U.C. Membership.....	12.50	12.50	12.50	12.50	12.50	12.50
Board and Room.....	*400.00	*380.00	580.00	630.00	700.00	800.00
Miscellaneous (Recreation, club dues, laundry, drugs, etc.)....	50.00	65.00	80.00	130.00	208.00	286.00
Total.....	\$567.50	\$582.50	\$795.50	\$885.50	\$1038.50	\$1218.50

* Minimum cost includes five hours work per week.

withdraws from the University within the first five weeks from the first day of registration for the semester, a part of the incidental fee will be refunded.

Students who are classified as nonresidents of the State are required to pay each semester, in addition to the incidental fee, a tuition fee of \$150. It is important for every prospective student to note carefully the rules governing legal residence in the University, which are stated on page 55. For conditions governing the commutation of the tuition fee for graduate students, see the ANNOUNCEMENT OF THE GRADUATE DIVISION.

Fees in the professional schools and colleges.—In the professional schools and colleges tuition and general expenses differ. Nonresidents of California enrolled in the School of Jurisprudence pay a fee of \$185 a semester, which includes the incidental fee paid by all students.

In the Medical School, tuition for residents is \$125 a semester; for nonresidents, \$250. (Note that entrants are required to make an advance payment of \$50 upon acceptance of the application for admission.) Undergraduate resident students in the College of Dentistry pay a tuition fee of \$100 a semester, nonresidents, \$175; resident graduates, \$150, nonresidents, \$225. In the College of Pharmacy the tuition fee for undergraduate resident students is \$100 a semester; for nonresidents \$175.

Further information about fees and expenses in the professional curricula is given in detail in the separate announcement of each school or college. Copies may be obtained from the dean in charge.

Laboratory fees.—There are no laboratory fees. The incidental fee has been adapted to meet these costs.

Living expenses.—The main item of expense for students living away from home is room and board. A detailed statement of costs will be found below, under Living Accommodations.

Other expenses.—Books and stationery for a student in the liberal arts courses average about \$35 to \$50 a year. Books and special equipment for students in the preprofessional and professional schools cost from \$50 to \$200. Exact information on these items may be obtained by writing directly to the school or department. Women students taking physical education are required to buy shoes which cost about \$2. Students who fail to pass the required examination in Subject A must pay a fee of \$20 for the course in Subject A (see page 38).

Membership in the Associated Students of the University costs \$12.50 each year (fall and spring semesters), and though membership is not obligatory, it is advisable. A membership card entitles the holder to a subscription to the student newspaper, the *Daily Californian*; membership in the Henry Morse Stephens Memorial Student Union, which is the center of campus life; privilege of admission free or at reduced rates to athletic contests; and participation in all student affairs, including athletic, student body, and class activities.

It is impossible to include in the foregoing figures such variable items as clothes or transportation to and from home, or fees other than the incidental fee. Students classified as nonresidents of the State must also add to their estimated budgets the tuition fee of \$150 a semester.

Tuition.—The University charges a tuition fee to every student who has not been a legal resident of the State of California for a period of one year immediately preceding the opening day of the semester during which he proposes to enroll. Such a student is classified as a nonresident. A student entering the University for the first time should read carefully the rules governing determination of residence, as quoted below, that he may be prepared, in the event of classification as a nonresident, to pay the required tuition fee. This fee must be paid at the time of registration. *The attention of prospective students, who have not attained the age of 22 years and whose parents do not live in the State of California, is directed to the fact that presence in the State of California for a period of more than one year immediately preceding the opening day of the semester during which it is proposed to attend the University, does not, of itself, entitle the student to classification as a resident.* An alien who has not made, prior to the opening day of the semester during which he proposes to attend the University, a valid declaration of intention to become a citizen of the United States is classified as a nonresident.

Tuition in the academic colleges is free to students who have been residents of the State of California for a period of one year immediately preceding the opening day of the semester during which they propose to attend the University. Students who are classified as nonresidents are required to pay a tuition fee of \$150 each semester. This fee is in addition to the incidental fee. The tuition fee may be remitted for distinguished graduate students in full graduate standing in other than professional schools and colleges, on the approval of the Dean of the Graduate Division. For conditions of eligibility for exemption from this fee, see the ANNOUNCEMENT OF THE GRADUATE DIVISION.

If the student is in doubt about his residence status, he may communicate with the Attorney for The Regents in Residence Matters. The Attorney may be consulted or communications may be addressed to him at Room 130, Administration Building, on the campus at Berkeley, or at Room 910, Crocker Building, San Francisco 4, California.

The eligibility of a student to register as a resident student may be determined only by the Attorney for The Regents in Residence Matters. Every entering student, and every student returning to the University after an absence is required to make a "Statement as to Residence" on the day of registration, upon a form which will be provided for that purpose, and his status with respect to residence will be determined by the Attorney soon after registration. Old students are advised that application for reclassification as a resident student must be filed within ten days after regular registration; by late registrants, within one week after registration. Application for a change of classification with respect to some preceding semester will not be received under any circumstances.

Refunds.—For students who leave before the end of any semester, part of the fees enumerated above may be refunded. A schedule of refunds and other information will be found in a separate circular (STUDENT FEES AND DEPOSITS) which may be obtained from the Registrar, University of California, Berkeley 4.

Rules Governing Residence

The term "nonresident student" is construed to mean any person who has not been a bona fide resident of the State of California for more than one year immediately preceding the opening day of a semester during which he proposes to attend the University.

The residence of each student is determined in accordance with the rules for determining residence prescribed by the provisions of Section 244 of the Government Code of California, and Section 20005 of the Education Code of California, provided, however:

1. That every alien student who has not made a valid declaration of intention to become a citizen of the United States, as provided by the laws thereof, prior to the opening day of the semester during which he proposes to attend the University, is deemed to be a nonresident student.

2. That no person is deemed to have made a valid declaration of intention to become a citizen of the United States whose declaration of intention at the time when it is presented in support of an application for classification as a resident student in the University has lost its force or effectiveness, or who can not, under said declaration, without renewing the same or making a new declaration, pursue his declared intention of becoming a citizen of the United States.

Every person who has been, or who shall hereafter be classified as a non-resident student shall be considered to retain that status until such time as he shall have made application in the form prescribed by the Registrar of the University for reclassification, and shall have been reclassified as a resident student.

Every person who has been classified as a resident student shall, nevertheless, be subject to reclassification as a nonresident student and shall be reclassified as a nonresident student whenever there shall be found to exist circumstances which, if they had existed at the time of his classification as a resident student, would have caused him to be classified as a nonresident student. If any student who has been classified as a resident student shall be determined to have been erroneously so classified, he shall be reclassified as a nonresident student, and if the cause of his incorrect classification shall be found to be due to any concealment of facts or untruthful statement made by him at or before the time of his original classification, he shall be required to pay all tuition fees which would have been charged to him except for such erroneous classification, and shall be subject also to such discipline as the President of the University may approve.

The nonresident tuition fee may be remitted in the case of students in full graduate status [except in the professional schools and curricula, e.g., Jurisprudence, Medicine, Public Health, Veterinary Medicine, Education (Teacher-Training, the M.Ed. I, II, and III, and the Ed.D. degree), Forestry, Librarianship, Social Welfare, City Planning, Criminology, Dental Surgery, Engineering (M.Eng. and degree of Engineer), Hospital Dietetics] who have proved that they are distinguished scholars and who are carrying full programs of work toward the fulfillment of requirements for academic higher degrees. No graduate student in full graduate standing, no matter how distinguished his scholarship may have been, will be exempted from the payment of the tuition fee if he is merely carrying some lower division or other courses for his cultural advancement.

The term *distinguished scholarship* in connection with the question of exemption from the payment of the tuition fee is interpreted as follows: The scholarship standing must have been excellent throughout a period of no less than two years just preceding the time of application for this privilege. Moreover, only students from institutions of high standing in scholarly work will be considered. Applicants for this privilege will be required to have sent to the Dean of the Graduate Division confidential letters about themselves from persons

who are thoroughly acquainted with their personalities and their intellectual achievements. It should be clear from these statements, therefore, that only the decidedly exceptional student will be eligible for the privilege of exemption from the payment of tuition if he is a nonresident. Students exempted from the tuition fee pay only the incidental fee.

The privilege of exemption from the nonresident tuition fee may be revoked at any time at the discretion of the Dean of the Graduate Division if in his judgment a student fails to maintain distinguished scholarship, or if he proves himself unworthy in other respects.

LIVING ACCOMMODATIONS

Advice and information about all types of living accommodations may be obtained from the Housing Office, Building Q, University of California, Berkeley 4, California. Lists of approved boarding and lodging houses for men and women, lists of rooms in private homes, and apartments (including those available in the two Veterans Villages in Albany and Richmond) are all available at the Housing Office.

The cost of room and board depends entirely upon the type of accommodations desired. In the residence halls and boarding houses, the estimated cost per semester is between \$250 and \$330 for men, and between \$250 and \$350 for women. In most of the boarding houses, the cost includes room and twelve or fourteen meals a week. In the University residence halls and International House, the cost includes room and twenty meals a week. In coöperative houses for single men, the cost is approximately \$190 to \$205 a semester plus five hours of work a week. In coöperative houses for single women, the cost is between \$180 and \$195 a semester plus five hours of work a week. Rooms in private homes and apartments vary greatly in price depending upon size and location. Apartments are difficult if not impossible to find.

Householders and students are expected, at the time the accommodations are arranged for, to have a contract in writing covering terms of payment, indicating whether or not rent is to be paid during vacations, what laundry facilities are available, stating the number of meals served per day, and including any other matters which would affect their business relations. Students should read with care any contemplated contract, in order that no misunderstanding may arise either on the part of the householder or the student. Contracts in the University residence halls are for the period of an academic year. Customarily, other accommodations are arranged for a period of at least an entire semester.

All undergraduate students will be required to file a residence card. No approval is required for the college residence of men students. New undergraduate women students who do not live in their own homes are expected to live in houses approved by the University. Every undergraduate woman must have the written endorsement of the Dean of Women for her college residence

before she will be permitted to complete her registration. Every undergraduate woman under 21 years of age not living in an approved house must have not only the permission of the Dean of Women for her college residence, but also the permission of her parent or guardian, whose approval must be indicated by signature on the Women's Residence card provided at the time of registration.

Approved boarding and lodging houses, exclusively for women, have been inspected by the University authorities. They are all within walking distance of the campus. A list of these houses is published annually. Reservations must be made with the person whose name appears on the list as manager.

University residence halls for women include Stern Hall and the seven Fernwald halls: namely, Mitchell, Peixotto, Richards, Oldenberg, Freeborn, Cheney, and Cunningham halls. Stern Hall is a gift of Mrs. Sigmund Stern; it accommodates 89 undergraduate women. The price for room and board is \$325 a semester or \$650 for the academic year. Application must be made to the Housing Office the semester prior to prospective residence. The Fernwald halls accommodate 466 women. Five of the halls house 78 undergraduate women each, and two of the halls house 38 undergraduate women each. The price for room and board is \$315 a semester or \$630 for an academic year. Application should be made to the Housing Office, Building Q.

Approved boarding and lodging houses, exclusively for men, have been inspected by the University authorities. These houses are within walking distance of the campus. Reservations must be made with the person whose name appears on the list as manager.

The University residence hall for men, Bowles Hall, is a memorial to Philip Ernest Bowles, member of the Class of 1882 and for twelve years a Regent of the University. Two hundred and four undergraduate men can be accommodated. The price for room and board is \$295 a semester or \$590 for an academic year. Application must be made to the Housing Office the semester prior to prospective residence.

International House is a residential and social center for American and foreign students. The residence facilities for men and for women are separate, the social halls and dining rooms being used in common. Ordinarily, residence is open only to graduate and upper division students; however, applications from all non-Caucasian Americans, and from all foreign students will be given careful consideration. Applications and requests for information should be sent directly to International House, University of California, Berkeley 4.

Fraternities and sororities. Fraternity membership is by invitation only. All men students who are interested in membership in such groups should submit their names and addresses to the Adviser for Men, Office of the Dean of Students, at once. From these, "rushing" lists will be compiled and distributed to the fraternities.* The majority of the national sororities maintain chapters

* Men who are accepted for residence in Bowles Hall and women who are accepted for residence in Stern Hall are not permitted to participate in rushing activities or to pledge a fraternity or sorority.

here. There are also several local sororities and clubs. Each of these organizations provides living quarters for its members. The sorority houses and clubhouses are approved by the University. Membership in these organizations is by invitation, and women students who are interested in membership in a sorority or club may obtain information from the Dean of Women. Monthly bills in sorority and fraternity houses and in clubhouses range from \$60 to \$70, exclusive of initiation and pledge fees. These prices ordinarily include dues, lodging, and three meals a day. As temporary accommodations are usually not available in boarding and lodging houses, students who anticipate living in fraternity or sorority houses during their first semester should make temporary living arrangements for the rushing period. Reservations in the University residence halls for women, except in Stern Hall,* will be open to women intending to participate in rushing on condition that they remain for the entire academic year.

STUDENT EMPLOYMENT

Many students who plan to attend the University expect to earn part or all of their expenses. The following statements are made, not to discourage the able student who must work, but to forearm him with facts and information so that he may plan carefully and intelligently, and by so doing overcome many of the difficulties that might otherwise lead to disappointment and failure.

It is not often advisable for a student to undertake outside employment until he has had 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 semester the student should know the demands of University life and his own capabilities well enough to make it possible to plan a combined program of studies and work for subsequent semesters. A student in good health can, with reasonable diligence, carry an average program of studies, and give from twelve to eighteen hours a week to outside employment.

The undergraduate curricula are organized on the assumption that students will give the major part of their time and attention to their studies. A student who is largely self-supporting must consider at the outset the possibility of taking more than the minimum number of semesters required to obtain a degree, if he is to maintain his scholastic standing and his health, and to enjoy the advantages of University life. Students who are not physically strong or in good health should not attempt to be wholly self-supporting because of the danger of jeopardizing health and academic progress.

There are some part-time cash jobs available to men students, but it is not always easy to fit an academic program to the employer's needs. In most cases programs must be arranged before referrals for employment can be given. Those who have a limited amount of time available or difficult class

* Men who are accepted for residence in Bowles Hall and women who are accepted for residence in Stern Hall are not permitted to participate in rushing activities or to pledge a fraternity or sorority.

schedules can often supplement their income by doing gardening and housework. There are many opportunities for men students to work in exchange for board.

Women students can usually be placed in private homes to work eighteen hours a week in exchange for room, board, carfare, and \$10 a month. A limited number of these positions offer room and board and carfare only, in exchange for fifteen hours of work a week. Although experienced waitresses and expert stenographers have less difficulty than others in securing permanent part-time cash jobs, there is usually not a sufficient demand just at registration time to take care of all who apply for such work.

Since the majority of part-time cash positions require from 20 to 24 hours of work a week and transportation time, students who must be entirely self-supporting should plan to carry a limited academic program.

BUREAU OF OCCUPATIONS

The Bureau of Occupations assists students in finding part-time employment and graduates other than teachers in obtaining full-time employment. There is no charge for this service. Arrangements for employment through the Bureau of Occupations cannot be made by correspondence; a personal interview with a member of the staff is required of everyone. The office of the Bureau of Occupations is in South Hall Annex.

BUREAU OF GUIDANCE AND PLACEMENT

The Bureau of Guidance and Placement has as its chief function the coordination, under one executive officer, of the teacher placement activities on the Berkeley, Los Angeles, and Santa Barbara campuses.

OFFICE OF TEACHER PLACEMENT

The Office of Teacher Placement recommends graduates, students, and former students for positions in universities, colleges, junior colleges, high schools, and elementary schools, and for educational research, thereby assisting qualified candidates to obtain permanent employment or promotion in the work for which they have prepared themselves. A fee of \$5 is charged for the clerical services of this office. Communications should be addressed to the Manager of the Bureau of Guidance and Placement, 207 Administration Building, University of California, Berkeley 4.

The University reserves the right to refuse to extend its cooperation to candidates who apply for positions for which they are manifestly unfit. In every recommendation the aim is to keep in mind the best available persons, remembering candidates already employed as well as those who may be out of employment.

VETERANS AFFAIRS

A campus Coördinator of Veterans Affairs maintains an office which is responsible for accrediting veterans to Federal and State agencies and for furnishing books, equipment, supplies, and services in accordance with Federal and State veterans education legislation. The office also works out with returning service men and women the many irregularities in their educational programs resulting from war service, maintains liaison in their behalf with the United States Veterans Administration, and assists them in becoming assimilated in the life and spirit of the University.

The office of Veterans Affairs is situated on the campus in Building F, Dana Street, near Allston Way (opposite Gymnasium for Men).

In addition, the United States Veterans Administration maintains an office, in the charge of a Training Officer, to assist returning service men and women who are applying for federal educational benefits. This office is located in Building E, Dana Street, near Allston Way.

Information regarding educational benefits available from the State of California may be obtained from the California Veterans Welfare Board, Sacramento 7, California.

Veterans must present an original or supplemental Certificate of Eligibility and Entitlement (Veterans Administration Form 7-1950 or 7-1953) and register within the registration period to obtain full veteran benefits. Veterans should apply to their local United States Veterans Administration Office in sufficient time to receive their certificates of entitlement prior to registration, or be prepared to pay all expenses (tuition, fees, books, and supplies). Veterans who make late application for admission and who may not register within the regularly announced dates for registration, must be prepared to pay all fees and purchase all books. These fees and purchases will be refunded on a prorata basis according to the date of late registration. In these cases, subsistence allotments will be prorated also.

Counseling centers are located on or in the vicinity of each campus. Services of these centers are available to all veterans without cost. They offer vocational counseling which may include aptitude testing and use of the center's library of occupational materials, as well as extensive interviewing. The Counseling Center for the Berkeley campus is located in Building C, Allston Way.

SCHOLARSHIPS, PRIZES, LOANS

Through the generosity of alumni and friends of the University, scholarships, fellowships, prizes, and loan funds have been established which are available to undergraduate and graduate students in accordance with the conditions laid down by the donors.

Scholarships and Fellowships.—A circular giving information about undergraduate scholarships may be obtained from the Committee on Undergrad-

uate Scholarships, 201 Administration Building. Students who maintain an excellent scholarship standing are eligible to make application. Holders of undergraduate scholarships must carry a minimum of 12 units a semester. Applications for scholarships for any academic year (July 1-June 30) must be filed with the Committee on Undergraduate Scholarships not later than the preceding December 31 by students already in attendance, and not later than March 1 by entering students. Application forms are available in the office of the Dean of Students, 201 Administration Building, each year from the beginning of the last week in November.

Information about fellowships for graduate students may be obtained from the Dean of the Graduate Division. Fellowships and graduate scholarships are ordinarily awarded as a mark of honor, on the basis of scholarship, not of need. The holders of fellowships or graduate scholarships are expected to devote all their time to graduate study and research in the University. Applications for fellowships and graduate scholarships must be filed with the Dean of the Graduate Division not later than February 20, prior to the academic year in which the award is tenable.

Prizes.—A complete list of available prizes, together with the regulations governing each competition, may be obtained from the Registrar.

Loans.—The loan funds for both graduate and undergraduate students are administered in the office of Dean of Students. Loans are not available to students in their first semester of residence at the University. Applicants are required to have a creditable scholarship record and must present a satisfactory repayment program. There are no loans available by which a student may finance his entire college course.

REQUIREMENTS IN THE SEVERAL COLLEGES, SCHOOLS, AND CURRICULA

COLLEGE OF LETTERS AND SCIENCE

THE FIRST two years in the College of Letters and Science constitute the lower division. During this period it is expected that the student, besides fulfilling the prerequisites for the major work upon which he will later concentrate, will make an effort to establish a basis for that breadth of culture which will give him a realization of the methods and results of some of the more important types of intellectual endeavor, and a mental perspective that will aid him in reaching sound judgments. The requirements of the first two years are designed for these purposes and are given in detail later on. A student, upon fulfillment of these requirements with not less than a C average, and with at least a year of residence in the University, and at least the final semester in residence in the College, is awarded the degree of Associate in Arts. There are many for whom two years of general education is sufficient preparation for their subsequent life activities.

The upper division, consisting of the third and fourth years, constitutes a period of more advanced study and limited specialization. In order to be admitted to the upper division, a student must have either received the Associate in Arts degree in the College of Letters and Science at Berkeley or Los Angeles, or have fulfilled, at this or another institution, the lower division requirements set forth below.

Approximately half of a student's time in the upper division is devoted to advanced study in some particular field, called the major. In many cases the major consists of a program of related courses as set up by one of the departments. In other cases, combinations chosen from more than one department have been set up and are known as group majors. Again, a student has the privilege of presenting for approval his own program of correlated studies known as an individual group major. The major or group major that the student has completed is stated on his diploma. A student who desires less concentration than is required in one of the above majors may enroll in what is known as the general curriculum. This consists of 36 units of upper division courses on the Letters and Science List of Courses selected according to the student's own preference from not more than three departments. These departments need not be related. The general curriculum allows a student to continue with a more general education and meets the needs of many who look forward to nonprofessional occupations. His diploma states merely that he has graduated in the general curriculum; if, therefore, he wishes to attain competence for some specialized activity, it may be to his advantage to present a major or a group major and receive the advice of a member of the faculty especially competent in his chosen field.

The courses and curricula in the College of Letters and Science are designed to give the student an education, the value of which is not limited by its possible vocational use. In this respect it differs from a purely technical college, the value of which is realized mainly in the vocational application of the instruction offered. For example, a major in Greek might, of course, lead ultimately to a professorship in Greek, but its value would not disappear on entering some other occupation. Again, zoölogy is a subject basic to the profession of medicine, but it also reveals the nature of life processes, a topic to excite the curiosity of a person with an inquiring mind.

To safeguard this character of instruction in the College, there has been set up a Letters and Science List of Courses the educational values of which are regarded as not dependent upon their vocational applications. Nearly all courses elected by the student must be chosen from this list.

The maintenance of a B average or better secures privileges that the student may well regard as valuable, particularly in the upper division, where this standing qualifies the student as an honor student.

Following this general introduction, a prospective student should familiarize himself with the more detailed information given in the following paragraphs.

Faculty Advisers and Study-List Regulations

Lower division.—Every lower division student at the time of registration will report to a faculty adviser and his study list must be approved by an adviser. Special advisers are provided for students in architecture, dentistry, medicine, nursing, optometry, and public health. Study lists aggregating 12 units or more a semester may be presented without special permission in respect to quantity of work except that during the freshman year or, in the case of transfer students, their first semester of residence at the University, the maximum is 16 units. Requests to take fewer than 12 units must be approved by the Dean of the College.

Two lower division courses in physical education may be included in a student's academic program to the extent of not more than 1 unit in any semester or session, in addition to the above study-list limits, and with degree credit totaling not more than 4 units.

A student in the lower division may each semester designate his intended major. The student may seek advice from his proposed major department or committee. Students who fail in the lower division to fulfill the requirements of a department regarding both subjects and grades may be denied the privilege of a major in that department.

Advisers for students entering with advanced standing.—Students entering the College of Letters and Science after attendance at other institutions will report to faculty advisers if they are lower division students; upper division students receive advice concerning the major from the major adviser. Such students, however, frequently have problems unrelated to the major, and should

call at the office of the Dean to confer about their problems concerning elective courses. Students undertaking the general (nonmajor) curriculum should report to the adviser.

Upper division.—Each upper division student must designate his major or group major on his study-list card, he must register with his major department, or committee in charge of the group major, and his study list must be approved (in respect to its relation to his major program) by a representative of the major department or group major committee before it will be accepted by the Registrar. Furthermore, all cards must be presented at the office of the Dean of the College for approval if totaling less than 12 units.

Students who fail in the lower division to complete the preparation for a major, both in subjects and grades, may, at the option of the department, be denied the privilege of a major in the department concerned.

A change in the major may be made only by permission of the Dean of the College and of the department to which the student petitions to transfer. Notice that the change has been authorized will be sent by the Registrar to the departments concerned.

All students are required to complete at least 6 units in their major during their last or senior year; either 3 units each semester, or 2 units in one semester and 4 units in the other.

Students who enter the College of Letters and Science of the University of California after attendance at other institutions, or other colleges of this University with senior standing at the time of their admission, must complete at least 24 units, including 18 units of work in upper division Letters and Science courses, of which at least 12 units must be in their major department or group major in this University.

Status of courses in professional curricula.—Certain designated professional curricula (as in the first year of the Medical School) are accepted as constituting a year's work toward the A.B. degree. If these are offered in place of a major in Letters and Science, all the courses required or included as part of the student's program in that curriculum become required courses for the degree.

Lower Division Requirements

Students who transfer from other colleges of the University of California or from other institutions will be required to meet the lower division requirements in this College but will not be held strictly to the time distribution of requirements, if the credit allowed them in the College of Letters and Science at the University of California amounts to at least 60 units.

Certain of these requirements may be satisfied by courses taken in the high school. It is desirable that the student should so arrange his high school program as to reduce the required work in the fields of foreign language, mathematics, and natural science. This makes his program more flexible, gives him a greater freedom of choice, and prepares him to pass more quickly into

advanced work or into new fields of study. The satisfaction of requirements in the high school does not, however, reduce the amount of work required in the University for the degree of Associate in Arts (60 units) or for the A.B. degree (120 units).

The degree of Associate in Arts will be granted on the completion of not less than 60 units of college work, including at least the last two semesters in residence at the University and at least the last semester in this College, with a grade-point average in all work done in the University of not less than 1.00 (a C average), and the fulfillment of the following general and specific requirements:

- (a) *General University Requirements.*†
 Subject A. (See page 38.)
 Military science and tactics, 8 units (men). (See page 40.)
- (b) *Foreign Languages.* At least 16 units in not more than two languages, with not less than 4 units in any one language. The first two years of high school work in a foreign language will be counted in satisfaction of four units of this requirement and each year thereafter as 4 units. Courses given in English by a foreign language department will not be accepted in fulfillment of this requirement. A student may satisfy this requirement either in whole or in part by giving such evidence of his proficiency in foreign language as may be authorized by the Executive Committee of the College.
- (c) *Mathematics.* Elementary algebra and plane geometry.
- (d) *Natural Science.* At least 12 units chosen from the following list:
 High school physics*, 3 units (1 high school credit).
 High school chemistry*, 3 units (1 high school credit).
 Anthropology 1.
 Astronomy 1A, 1B, 2*, 7A-7B.
 Bacteriology 1*, 2*, 4*.
 Botany 1*, 12, 15*, 16*.
 Chemistry 1A*-1B*, 5*, 8.
 Entomology 1*.
 ‡Geography 1.
 Geology 1, 2, 3.
 Paleontology 1, 10.
 Physics 2A-2B, 3A-3B*, 4A-4B-4C**, 10.
 Physiology 1, 1L*.
 Zoölogy 1A*, 1B*, 10.

† For information concerning exemption from these requirements, apply to the Registrar.
 * Will be accepted as a laboratory course.

‡ Geography 1 may be used in partial satisfaction of the natural science requirement; if so used, it may not be included in requirement (e), group 4.

** Two courses from 4A-4B-4C satisfy the laboratory requirement.

Undergraduate Departments

The student must include among the courses taken in satisfaction of the requirement in natural science at least one course in laboratory science. Any of the courses marked with an asterisk in the foregoing list will be accepted in fulfillment of this requirement. Courses with but one unit of laboratory science are not accepted as fulfilling this requirement and are not marked above unless they have as prerequisite a course that also requires one unit of laboratory work.

(e) Additional. A sequence (of 5 or 6 units) in subjects of college level, except as otherwise provided, in each of four of the following six groups, one of which may be postponed to the upper division:

- (1) English, speech.
- (2) Foreign language (additional to *b*). This may be satisfied by one college course of not less than four units, or by two years of high school Latin.
- (3) Mathematics. This may be satisfied partly in the high school, as indicated below.
- (4) Social sciences.
- (5) Philosophy.
- (6) Fine arts (architecture, art, music) and literature. This may be satisfied by two or more courses which may or may not form a sequence.

Year Courses Acceptable in Fulfillment of Requirement (e) for the Degree of Associate in Arts

Group 1—English and Speech

English 1A-1B; Speech 1A-1B.

Group 2—Foreign Languages

Classics: Greek 1A-1B, 101, 102; Latin 1, 2, 3, 4. Any year sequence from the following: Latin 105, 106, 107, 108. Two years of high school Latin are accepted as satisfying this requirement.

French: 1, 2, 3, 4, 4B, or any upper division year sequence.

German: 1, 2, 3, 4, 3S-4S, or any upper division year sequence.

Italian: 1, 2, 3, 4, or any upper division year sequence.

Near Eastern Languages: 21A-21B, 131A-131B, 151A-151B, 161A-161B.

Oriental Languages: 12A-12B, 9A-9B.

Portuguese: 1, 121, 122, 123.

Slavic Languages: 1, 2, 6A-6B, 10A-10B, or 14A-14B.

Spanish: 1, 2, 3, 4, or 25A-25B, or any upper division year sequence.

Group 3—Mathematics

Any two of the following courses: C or high school trigonometry, 1, 2, 3A or 11A, 3B or 11B, 10, 12.

Group 4—Social Sciences

- Anthropology 2A-2B.
 Economics 1A-1B.
 *Geography 1-2.
 History 4A-4B, 8A-8B, 17A-17B, 19A-19B.
 Near Eastern Languages 13A-13B.
 Political Science 1, 2.
 Psychology 1A and 1B or 33.
 Sociology and Social Institutions 1-2, 10A-10B.

Group 5—Philosophy

- Philosophy 6A-6B.
 Philosophy 12A-12B.
 Philosophy 20A-20B.

Group 6—Fine Arts and Literature

- Architecture 5A, 5B, 5C, 6A, 6B, 6C.
 Art 1A, 1B, 1C, or 1D.
 Classics 34.
 English 30, 44A, 44B, 46A, 46B, 49.
 French 39A, 39B, 39C.
 German 39A, 39B, 39C, 39D.
 Music 27A, 27B, 27C, 27E.
 Music 30A, 30B.
 Speech 2A, 2B.

Summer Sessions courses.—Students who desire to satisfy the specific subject requirements for the degree of Associate in Arts in the Summer Sessions may use only those courses which are the equivalent of courses offered in the regular semesters listed as acceptable in meeting requirements for the degree of Associate in Arts.

Requirements (b), (c), (d), and (e) may be met in whole or in part by the completion of acceptable courses in University Extension. For a list of such courses, see the announcements of University Extension. The requirements in units must be met in full. Students who desire to satisfy specific subject requirements for the degree of Associate in Arts in University Extension may use only those courses which are the equivalent of courses offered in the regular semesters and listed as acceptable in meeting requirements for the degree of Associate in Arts.

Honorable mention with the degree of Associate in Arts.—Honorable mention will be granted with the degree of Associate in Arts to students who attain at least an average of two grade points for each unit undertaken. The list of

* If Geography 1 is used in satisfaction of requirement (e), it may not be used in satisfaction of requirement (d).

students who receive honorable mention with the degree of Associate in Arts will be sent to the chairmen or study-list officers of departments before the beginning of the next semester. A student who gains honorable mention has thereby attained honors status for his first semester in the upper division.

Upper Division Requirements

The degree of Bachelor of Arts is granted upon the following conditions:

1. The total number of units in college courses in the lower and upper divisions offered for the degree must be *at least* 120, of which at least 108 must be in courses chosen from the Letters and Science List of Courses (see page 85). Not more than 6 units of courses numbered in the 300 or 400 series will be accepted toward the A.B. degree. No credit will be allowed toward the A.B. degree for work completed at a junior college after the student has completed 66 units toward the degree.

2. The student must attain as many grade points as there may be units in the credit value of all courses undertaken by him in the University. (Attention is directed to the fact that the School of Education will admit to candidacy for the Certificate of Completion only those students who have maintained a grade-point average of not lower than 1.5 in the work undertaken during the junior and senior years.)

3. At least 54 units of college work must be completed after admission to the upper division.

4. The requirement of American History and Institutions must be completed by all candidates for the bachelor's degree. Students may complete this requirement by passing a single examination in American History and Institutions, for which no unit credit will be assigned; by completing certain courses; by automatic equivalence granted for courses taken at a collegiate institution in California where it is indicated on the student's official transcript from the institution that the requirement has been satisfied; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and Institutions, page 39).

5. *At least 36 units of work chosen from the upper division courses named in the Letters and Science list* (see page 85), with the exceptions noted, must be completed after the student has attained upper division standing.

6. Fulfillment of either A or B:

A. A major of at least 24 upper division units according to the rules given below.

B. A general (nonmajor) curriculum of 36 upper division units named in the Letters and Science List of Courses according to the student's choice, distributed through not more than three departments with a maximum of 30 units permitted in any one department.

7. All candidates for the A.B. degree entering the College of Letters and Science of the University of California after attendance at other institutions, or colleges of this University, with senior standing at the time of admission, are required to have been enrolled during the senior or final year in resident courses of instruction at this University in the College of Letters and Science. At least 24 units, including at least 18 units in upper division courses, of which 12 units must be in the major, must be completed in this period. It is permissible to offer two summer sessions as equivalent to one semester; but in any event, the student must complete in resident instruction at least one regular semester of his senior year.

8. No student is permitted to transfer from one major department to another after the opening of the last semester of his senior year.

Majors for the A.B. Degree

A major consists of a substantial group of coordinated upper division courses, representing one or more departments of the College. If one year of an acceptable professional curriculum, for example the first year of the Medical School, is offered by the student as part of his program for the A.B. degree, this fulfills the requirement of the major. It will not be counted, however, as more than 30 units toward the A.B. degree.

Majors may be offered for the A.B. degree in any of the subjects or departments listed below. The details of the program must be approved by the authorized adviser in the major chosen.

Special attention is directed to the courses listed as preparation for or prerequisite to the major. Usually 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.

The 24-unit major must in its entirety be completed in the upper division. In exceptional cases, however, students who have completed all requirements for the degree of Associate in Arts may be permitted by the Dean, on recommendation by the department, to count not more than 6 units of upper division work taken in the lower division as part of the major, but not as part of the 36 units of upper division work required to be completed in the upper division.

Not more than 30 units of upper division courses taken in one department after admission to the upper division will be counted toward the A.B. degree.

The major must consist (1) of courses taken in *resident instruction* at this or another university (in a regular semester or in a summer session) or (2) of courses in University Extension with numbers having the prefix X, XB, XL, or XSB (with approval of department concerned). See, however, paragraph 7, above.

No courses numbered in the 300 series (teachers' courses) or 400 series (professional courses) will be accepted as part of the major.

See further, under Study-List Regulations, page 42.

Organized Majors and Professional Curricula

In order to fulfill the major requirement for the A.B. degree, a student may select one of the organized programs listed below. It is recognized, however, that suitable programs may be prepared that are not included in the published announcements. A student may therefore present a plan for a major program to the Executive Committee. If this meets the committee's approval, the committee will designate a member of the faculty to take charge of the student's special major and to approve his upper division study lists and the final completion of the major.

Detailed descriptions of the departmental programs designated below will be found under their respective departments under Courses of Instruction in later pages of this bulletin. Descriptions of the group majors follow the list hereunder.

- | | |
|--|------------------------------------|
| American Civilization | Italian |
| Anthropology | Japanese. See Oriental Languages |
| Art | Journalism |
| Astronomy | Labor and Industrial Relations |
| Bacteriology | Latin. See Classics |
| Biochemistry | Mathematical Statistics. See |
| Botany | Mathematics |
| Chemistry | Mathematics |
| Child Development | Medical Sciences |
| Chinese. See Oriental Languages | Music |
| Civilization of the Middle Ages | Near Eastern Languages |
| Civilization of the Nineteenth Century | Oriental Languages |
| Classics | Paleontology |
| Communication and Public Policy | Philosophy |
| Criminology | Physical Education |
| Decorative Art | Physics |
| Dramatic Art | Physiology |
| Dramatic Literature | Political Science |
| Economics | Premedical Curriculum. See Medical |
| Education | Sciences |
| English | Psychology |
| Far Eastern Studies | Public Speaking. See Speech |
| French | Recreation |
| Geography | Regional Group Majors |
| Geological Sciences | Religion |
| Geophysics. See Geological Sciences | Renaissance, The |
| German | Sanskrit. See Classics |
| Greek. See Classics | Scandinavian Languages and |
| History | Literature |
| International Relations | |

Sculpture	Spanish
Slavic Languages	Speech
Sociology and Social Institutions	Wildlife Conservation
Social Welfare	Zoölogy

Description of Group Majors and Curricula

Students who plan to complete a group major should note the requirements for admission to the upper division as well as the prerequisite courses for the major.

AMERICAN CIVILIZATION

Group Major Adviser: ———

Preparation for the Major.—Students must have maintained an average grade of C and must have obtained the degree of Associate in Arts or upper division standing.

The Major.—Twenty-four units, of which 21 units are to be selected by the student with the approval of the committee in such fields as American history, political science, economics, literature, philosophy, and the fine arts. The student will stress one of these fields and conferences will be held to adapt the program to the student's particular needs. A comprehensive final examination to be taken at the end of the senior year will count for three of the 24 units.

CHILD DEVELOPMENT

Group Major Adviser: Miss LANDRETH.

Preparation for the Major.—Required: Psychology 1A, Psychology 5 or Economics 2 (two years of high school algebra, or Mathematics D), Economics 1A, Physiology 1, Physiology 1L. Recommended: Psychology 1B or 33, Anthropology 1, Economics 1B, Zoölogy 10, Public Health 5A.

The Major.—Required: Psychology 112 (or Home Economics 132), Psychology 113, 162, Home Economics 135, Physiology 102, Home Economics 111, Public Health 125, Social Welfare 100. Recommended: Psychology 101A–101B (for students preparing for child development research), Psychology 116, Psychology 160, Education 116.

CIVILIZATION OF THE MIDDLE AGES

Adviser: Mr. BRENNER.

By the term Middle Ages is meant the civilization which reached its climax in France in the thirteenth century.

Preparation for the Major.—Required: A reading knowledge of French, at least equivalent to that attained by passing French 3 (Intermediate French); History 4A; English 46A; French 39A; Philosophy 20A–20B; English 1A–1B. Recommended: German 39A; and a reading knowledge of Latin, German, or Italian, similar in scope to the reading knowledge of French required above.

The Major.—French 122A–122B; History 121A–121B; Italian 109A–109B or Italian 150A–150B; Art 175A–175B; a course in Medieval Thought such as History 125C, or a suitable course in Medieval Philosophy. A minimum of 9 units selected from the following list: German 118A, 135; Spanish 107A; History 122, 152; Classics 180B; English 151, 155, 116.

CIVILIZATION OF THE NINETEENTH CENTURY

Adviser: Mr. ROWBOTHAM.

Preparation for the Major.—Required: English 1A-1B, 46B; History 4A-4B; Philosophy 20A-20B; Economics 1A-1B; Art 1B or Music 27B or 30B. Recommended: English 41A-41B; Architecture 5C; French 39B; German 39C.

The Major.—Required: 30 units distributed as follows—9 units chosen from the following courses: English 121, 122, 123, 130B, Dramatic Art 157A-157B, Slavic Languages 130; 6 units from: History 134A-134B, 145, 146, 150; 9 units from: Economics 101A-101B, 106, 117A-117B, 150, 152, 188A, 190A-190B, Political Science 118A-118B, 129; 6 units from: Philosophy 103 and Philosophy 108 or 146.

COMMUNICATION AND PUBLIC POLICY

Adviser: Mr. BARNHART.

The group major in communication and public policy is designed to contribute to an understanding of the role of mass communication in society. It introduces the student, in general, to the study of the nature, function, content, values, and effects of communication in society and directs his attention specifically to the effects of communication on public policy and opinion. The courses selected cover both these interrelated fields of study—the nature of language, and the nature of the media of mass communication: radio, press, film, as well as the role played by informative and persuasive communication in modifying the character of public opinion and public institutions.

Preparation for the Major.—Required: Speech 10, 12; History 4A-4B; Psychology 1. Recommended: Speech 1A-1B; Economics 1A-1B; Sociology and Social Institutions 1-2.

The Major.—Required: 24 units from Speech 117A-117B, 119, 135 (or 137 or 138); Journalism 141; Political Science 114; History 148; Psychology 145; Philosophy 108; 3 to 6 units of directed research in the senior year on selected topics; and 6 units from Sociology and Social Institutions 141A-141B; Journalism 190; Psychology 180; Political Science 115, 159, 157A-157B; Economics 101A-101B; Philosophy 104; Business Administration 163, 150; Anthropology 160; History 167A-167B.

CRIMINOLOGY

Two aspects of the field of criminology are represented by organized group majors: the technical, and the social.

Technical Aspects

This program is intended to train students for the scientific identification of such materials as may be used as evidence by police departments and courts of justice.

Group Major Adviser: Mr. KIRK.

Preparation for the Major.—Required: Chemistry 1A-1B, 5, 8, and 9 (or 12A); Physics 2A-2B, 3A-3B; Psychology 1A, 1B (or 33); Physiology 1, 1L; Mathematics 12 (or Psychology 5 or Economics 2).

Recommended: Botany 1; Geology 1; Speech 1A-1B; Mineralogy 4A, 4B; Zoology 1A-1B, 4.

The Major.—Required: Biochemistry 103, 108; Political Science 164, 166, 167A-167B, 168A-168B; Psychology 168 (or Political Science 165); Forestry 114; Zoology 119A-119B.

Recommended: Anthropology 150A-150B; Biochemistry 104, 107, 109; Botany 108; Geology 103, 104A-104B; Mathematics 3A-3B, 113; Philosophy 30; Physiology 100A-100B; Political Science 169; Psychology 160; Speech 110A-110B; Zoölogy 114.

Social Aspects

Group Major Adviser: Mr. WILSON.

Preparation for the Major.—Required: Economics 1A-1B, 2, or Psychology 5; Political Science 1-2; Psychology 1A-1B (or 33); Physiology 1.

Recommended: Anthropology 1; Architecture 1; Business Administration 1A-1B; Chemistry 1A-1B; Physics 2A-2B, 3A-3B; Psychology 3; Public Health 5A-5B; Speech 1A-1B, 2A-2B.

The Major.—Required: Political Science 163, 164, 165, 166, 167A-167B, 168A-168B, 169; Psychology 160 or 168; Social Welfare 101A-101B. Six units selected from the following: Anthropology 150A-150B; Business Administration 121A-121B, 163, 190, 191; Economics 142, 180; Journalism 130A-130B; Mathematics 120A-120B; Physiology 104A; Political Science 117, 151, 154, 155, 162, 172, 181, 183, 184, 261, 267A-267B, 281A-281B; Psychology 109, 112, 145, 146, 148A-148B, 180, 185, 245; Public Health 186; Speech 107A-107B, 110A-110B, 120; Social Welfare 100, 102, 105, 108, 110A-110B, 201, 262; Zoölogy 119A-119B.

DRAMATIC LITERATURE

Group Major Adviser: Mr. A. R. THOMPSON.

The major is concerned with the drama primarily as literature and a manifestation of humane culture. But since all plays are written for production on a stage, the relation of the drama to the theater is also emphasized, and candidates for graduation in this major should have acquired such practical experience in the theater, amateur or professional, as will enable them to recognize a play's theatrical as well as its literary value.

Preparation for the Major.—Classics 35 (if offered) and 6 units from the following: Speech 2A-2B; Dramatic Art 10A-10B.

The Major.—Thirty units, of which the comprehensive examination counts for 3 units. Required: English 114A-114B and one of the Shakespeare courses (English 117A-117B, 117E); Dramatic Art 157A-157B, 160A-160B; 6 units selected from English 154, Philosophy 136A-136B-136C, 146, Dramatic Art 130C-130D, 135.

The student must, at the end of the senior year, pass with a grade of C or higher a comprehensive examination consisting of two three-hour papers. The student's preparation for this examination should extend throughout his junior and senior years, but the grade will be assigned upon his passing the examination; credit, 3 units.

To graduate in this major the student must maintain at least a C average in all courses required for the major.

Graduates in this major who meet the special requirements for the master's degree in comparative literature may continue work in this field for that degree.

FAR EASTERN STUDIES

This major is intended for students who seek a more thorough knowledge of the Far East than can be attained by a major in any one department. The program is composed chiefly of courses in the social sciences dealing with Asia, the Far East, and the Pacific. Of particular importance is the fact that language study in Chinese, Japanese, or Russian may be included in the major.

Attention is called to the fact that students interested in the Far East may, if they wish, offer programs under the regional group majors on China, Japan, and Russia and eastern Europe. Specifications for these regional group majors are found elsewhere in this bulletin.

Advisers: Mr. BOODBERG, Mr. BINGHAM.

Preparation for the major.—Required: History 19A-19B and one of the following: Economics 1A-1B, Political Science 1, 2, Art 1D, Geography 1-2, 5A-5B, Anthropology 2A-2B. Strongly recommended: Oriental Languages 12A-12B, 13, 17; or 9A-9B, 13, 17; or Slavic Languages 1, 2, 18A-18B.

The Major.—Required: 24 units consisting of Geography 125A-125B, History 192A-192B, Political Science 136, 138, Economics 115, 190A or 190B, Anthropology 101B, 143, or 147; Oriental Languages 100A-100B, Art 160A-160B, 161, and 12 units selected from upper division courses dealing with the study of Asia.

INTERNATIONAL RELATIONS

Group Major Adviser: Mr. F. M. RUSSELL.

Committee in Charge of the Major: Mr. RUSSELL, Mr. LANDAUER, Mr. PALM.

International relations embraces those social relationships which transcend the boundaries of national states. The major in international relations is devised to meet the needs of students interested in acquiring an understanding of the forces and influences conditioning present-day world politics, as well as the main problems and policies of organized states in their relations with one another in the twentieth century. These problems and policies must be dealt with and determined by governments, and consequently the major is built around courses dealing with intergovernmental legal, diplomatic, and economic relations. But the major cuts across departmental lines, for statesmen develop their policies in relation to geographic, economic, and social conditions, and in the light of historic policies. History reveals these traditional policies, regional geographic and anthropological studies provide an acquaintance with relevant physical and biological factors, and social psychology contributes to an understanding of nationalism and other phenomena in the field of study. Courses in other fields likewise make their contribution.

Preparation for the Major.—Economics 1A-1B; History 4A-4B; Political Science 1, 2.

The Major.—Economics 190A-190B; Political Science 123, 124, 133A-133B; 6 units of history selected in consultation with the adviser. A minimum of 15 units (exclusive of the 4-unit Beginner's Course) in one of the following languages: French, German, Spanish; or 15 units in Russian, Chinese, Japanese, or Portuguese. The language requirement may be met by passing a written reading test prior to the senior year.

Attention is directed to the following courses as useful in the study of certain aspects of this field: Anthropology 160, Economics 197, Geography 143, 153, Psychology 145. Others, dealing with areas of significance to students of international relations, are to be noted in the departments of Anthropology, Economics, Geography, History, Oriental Languages, and Slavic Languages.

LABOR AND INDUSTRIAL RELATIONS

Group Major Adviser: Mr. KERR.

The purpose of this program of study is to give the undergraduate student a broad, nontechnical understanding of the problems of wage and salary earners and of managers, the role of employers and unions in our society, and

the nature and implications of union-management relationships. The program is designed to meet the needs of students who have not decided upon specific vocational objectives or who do not wish to specialize to the extent of taking a departmental major, but who do desire a general orientation in this important area of social relations.

Students who have more specific objectives or graduate study in mind should note that this is a nonprofessional program of study and that it does not satisfy all the prerequisites for graduate study in such departments as Economics and Business Administration.

Preparation for the Major.—Required: Economics 1A–1B, Economics 2 or Psychology 5, and Psychology 1A; and one of the following: Political Science 1, Anthropology 2B or Sociology and Social Institutions 1. Recommended: Selections from Anthropology 1, 2A–2B; Economics 10; Political Science 1, 2; Psychology 33; Sociology and Social Institutions 1, 2, 10A–10B.

The Major.—Required: 36 units of upper division work as follows: (a) 24 units of background courses: Sociology and Social Institutions 141B, Anthropology 118B, Political Science 112B, Psychology 145, Economics 113, Economics 116A or 116B, Business Administration 190, and one of the following—Philosophy 108, Economics 106, Political Science 117 and 151, and Sociology and Social Institutions 132. (b) 12 units of specialized courses: Economics 150 or Business Administration 150; and 9 units selected from Business Administration 151, 152, 153, Economics 152, 185, Mechanical Engineering 143, Political Science 140, Psychology 185, Sociology and Social Institutions 102, 161.

The adviser must approve the 9-unit core program selected by the student under (b) and should be consulted as to the sequence of the entire 36 units. The adviser has a list of other related upper division courses which may aid the student in choosing electives.

MEDICAL SCIENCES

Candidates for the degree of A.B. in the College of Letters and Science who plan to pursue the four-year curriculum leading to the M.D. degree in the Medical School may reduce by one year the total time for attaining the two degrees, by offering the first year of the Medical School curriculum as the senior year of the College of Letters and Science. In order to do this the student should register as a premedical student on entering the College of Letters and Science. He should then fulfill the requirements for the degree of Associate in Arts, comply with the requirements in American History and Institutions and military science, complete the premedical subjects required for admission to the Medical School, and attain full senior standing. Full senior standing for this purpose means the completion of at least 90 units toward the A.B. degree (at least 24 after receipt of the degree of Associate in Arts), including at least 6 units of upper division courses (on the Letters and Science list) taken in the upper division. In order that the student may matriculate into the Medical School in his fourth college year, it is essential that he satisfy the lower division requirements by the end of his sophomore year.

A student who has attained full senior standing in the premedical curriculum has thereby complied with the requirements for admission to the Medical School, and if he is admitted to the Medical School may register simultaneously as a senior in the College of Letters and Science. The curriculum of the first year of the Medical School will be accepted as the senior year (30 units) of the College of Letters and Science, and as fulfilling the major requirement for the A.B. degree.

Enrollment in the Medical School is limited. Candidates for admission to the first-year class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. Two personal interviews are also held. Arrangements for personal interviews are made by the Dean's office after a formal application has been filed and credentials rated. In addition, each applicant must take the Medical College Admission Test.

California applicants. With the exception of the five places mentioned below, under *Out-of-State Applicants*, selection of the class will be limited to California applicants.

To be considered a *California applicant*, a student must meet one of the following requirements:

(a) he must have completed *sixty* units or more of premedical work in a college or university in the State of California, or,

(b) he must be a *legal resident* of the State of California, who lived in the State *prior* to beginning of his premedical work and who left the State *temporarily* for the completion of all or part of his premedical work.

Out-of-State applicants. Not more than *five* students will be accepted who have taken their premedical work outside of the State of California.

(a) Of these five, *four* will ordinarily be selected from the following western states not having medical schools: Nevada, Arizona, Idaho, Montana, Wyoming, and New Mexico, or from the Territory of Hawaii. To be considered in this category, *the applicant must be a legal resident of the state concerned* (or of the Territory of Hawaii).

(b) Ordinarily not more than one applicant will be accepted from outside of the continental United States and Hawaii. This applicant must have completed at least one year at the University of California or at an equivalent institution in the United States, one semester of which must have been completed previous to February 15 of the year of admission. It may happen that a student who has completed the premedical curriculum and attained full senior standing in the College of Letters and Science is not admitted to the Medical School. In order to qualify for the A.B. degree, such a student must select some other major subject, and complete the requirements of its program and the other requirements for the degree. It may be impossible for such a student to complete his chosen major program in one year unless he has already partly fulfilled its requirements before entering the senior year. It is therefore desirable that each premedical student should plan his program with this contingency in mind, and undertake in his junior year the part of the major program of his alternative choice that will make it possible for him to complete the program for the A.B. degree in one year if he is not admitted to the Medical School. This can be done without in any way interfering with the completion of the premedical requirements.

An applicant for admission to the Medical School who in any year is unsuccessful in gaining admission to the School on account of an inferior scholarship record, may, at the proper time, present a second application for admission. His success in admission will depend on his scholarship rank as a member of the group of applicants for the new group.

An accepted applicant who finds it impossible to begin his work in the Medical School with the entering class, or a student who actually enters and begins his work, but finds it necessary to withdraw during his first year, loses his place in the list of applicants and is required, in the event he desires to begin his work in a later year, to reapply with the group of applicants for that year.

While it is virtually essential that a student register in the premedical curriculum if he wishes to proceed to the A.B. and M.D. degrees in the shortest

possible time, such registration is not required for admission to the Medical School. Certain medical schools require an A.B. degree for admission; and the holder of an A.B. degree who has not been in the premedical curriculum may apply for admission to the University of California Medical School, provided he has completed work in the specific subjects required for admission. The minimum requirements in these subjects in terms of courses offered at Berkeley are: English 1A-1B (or Speech 1A-1B); Chemistry 1A-1B, 5, 8; Physics 2A-2B, 3A-3B; Zoölogy 1A-1B, 4, 100; 8 units of a modern foreign language. Psychology 160, 168 and Public Health 160A, 160B are recommended strongly.

The Committee on Admissions to the Medical School is authorized to refuse admission to students who have a low academic record and to those of obvious physical, mental, or moral disability.

For further information concerning the Medical School see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

Premedical Curriculum

Advisers: Mr. JOHN C. TALBOT, Mr. D. HAROLD COPP, Mr. ROBERT M. JAMESON, Mr. HAROLD TARVER.

In order that entrance to the Medical School and attainment of the A.B. and M.D. degrees may not be delayed, the student should make sure that his program is arranged so as to satisfy the requirements for the degree of Associate in Arts by the end of the sophomore year, and all other premedical requirements by the end of the spring semester just preceding the proposed date of entering the Medical School. A suggested program follows.

<i>First Year</i>			<i>Second Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Subject A and American History and Institu- tions* .....		..	Military Science	2	2
Military Science	2	2	Zoölogy 1A-1B	4	4
Chemistry 1A-1B	5	5	Zoölogy 4 .....	..	2
†English 1A-1B or Speech 1A-1B	8	8	‡Foreign Language	4	4
‡Foreign Language	4	4	Year Course (See require- ment (e) for degree of Associate in Arts).....	3	3
Electives as necessary to make up units.....		3	Year Course (See require- ment (e) for degree of Associate in Arts).....	3	3
			Electives	1	..
	14	17		17	18

* For regulations concerning Subject A, see page 88; American History and Institutions, page 89.

† English: any 8 units in composition plus any 8 units in English literature will satisfy this requirement. Speech 1A or 1B may be offered in place of either course in English. If the student fails to pass the examination in Subject A it will be necessary to postpone English (or speech) until he has completed the course in Subject A, for which no credit in units is given. The student is advised to substitute in the interim one of the year courses which are required for requirement (e) for the degree of Associate in Arts in place of English (or speech).

‡ Foreign Language: the Medical School requirement is 8 units of credit in a modern foreign language, and the requirement for the degree of Associate in Arts is 16 units of foreign language in not more than two languages. These may be satisfied partly in the high school. The student's program should be made so as to satisfy these requirements.

Students who have completed the language requirement in whole or in part in high school may take Chemistry 5 or Chemistry 8 in the second year.

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Third Year

	Fall Units	Spring Units
Physics 2A-2B	3	3
Physics 3A-3B	1	1
‡Chemistry 5	3	or 3
‡Chemistry 8	3	or 3
Zoölogy 100	4	..
Electives	2 or 3	5 or 11
	16	15

Medical Sciences

The requirements of the first year of the Medical School are accepted as fulfilling the major requirement, and the senior year of the College.

Adviser: Dr. FRANCIS S. SMYTH.

Preparation for the Major.—The premedical curriculum outlined above.

The Major.—Anatomy 101, 105; Biochemistry 101M; Physiology 101M.

PHYSICAL EDUCATION

Group Major Advisers: For women—Miss HODGSON, Miss COLEMAN, Miss ESPENSCHADE. For men—Mr. HENRY, Mr. COZENS.

Preparation for the Group Major.—High school chemistry or the equivalent, Public Health 5A (3), Physiology 1-1L (5), Psychology 1A (3), Zoölogy 1A (4) or 10 (3), Home Economics 10 (2); physical education activities (Physical Education 1 or 26) (2-4); for women—rhythmic basis of dance and allied arts (Physical Education 54) (2); introduction to physical education (Physical Education 20) (1); and first aid (Physical Education 85A) (1).

The Group Major.—Physical Education 130 (3), 105 (4), 101 (4), 110 (2); Anatomy 102 (3); Education 110 (3); either Community Recreation (Physical Education 140) (2) or Tests and Measurements (Physical Education 135) (3); an upper division course dealing with the problems of society and human relations, to be chosen with the approval of the adviser (3).

Completion of a major program for graduation will be certified only on the basis of at least a C average in the courses required in the group major. Students who do not maintain such an average may be required at any time to withdraw from the group major in physical education.

RECREATION

The insistent demand for recreation in modern life has brought with it the realization of the responsibility of the community to provide not only space and facilities but also trained leadership. The College of Letters and Science, recognizing the need for trained leadership in this field, has established a group major in recreation. This major offers an integrated program of courses drawn from a number of departments and emphasizes a broad cultural background pointed toward an understanding of the needs and aspirations of individuals and groups in a democratic society, the significance of leisure in our civilization, and a skill in, and an appreciation of, a wide variety of leisure time activities.

‡ See double dagger (‡) footnote on page 79.

The group major in recreation is administered by a special committee of the College with F. W. Cozens, Professor of Physical Education, as chairman. Students will be assigned advisers according to their special interest in the various fields of study involved; that is, art, dramatic art, music, physical education, etc.

Group Major Advisers: Mr. COZENS, chairman; Mr. PEPPER, Mr. F. O. HARRIS, Mr. LAWTON, Mrs. GLASS, Mr. NEWSOM.

Preparation for the Major.—Physiology 1, Zoölogy 10, Psychology 1A, History 4A-4B, Dramatic Art 10A, and either 120 or 135, Philosophy 6A, a year sequence in both art and music, either Economics 1A-1B or Political Science 1 and 2, 4 units of specified activity courses in physical education (including course 343), and 12 units of courses leading to a field of specialization in the upper division.

The Group Major.—Required: 6 units from each of two fields (economics, history, political science) selected with the approval of the adviser; Physical Education 143A-143B, 144A-144B, Social Welfare 106, 108, and Philosophy 136A; 11 units in the field of specialization according to interest, art, dramatic art, music, physical education. The total group major program comprises 36 units of specified courses together with two summers' field work (or the equivalent) to be taken without credit.

Completion of a major program for graduation will be certified only on the basis of at least a C average in the courses required in the group major. Students who do not maintain such an average may be required at any time to withdraw from the group major in recreation.

REGIONAL GROUP MAJORS

The following group majors are designed to combine studies in the geography, history, government, and ethnography of an important region or country with intensive study of the corresponding foreign language. Their purpose is to afford a liberal education through an integrated group of courses, while at the same time to provide persons trained for diplomatic, commercial, and cultural relations between the United States and other nations. These majors will be administered with reasonable flexibility in view of the various fields of study involved and the different directions from which they may be approached. The usual differentiation between lower and upper division work will not be insisted upon. Although it is desirable that the prerequisites for the required upper division courses be taken in the lower division, admission to the major will not be refused if the student's program is such as to leave room for such prerequisites in the upper division. The total of upper division credit in the major should normally be not less than 30 units.

Regional Group Major on China

Advisers: Mr. BINGHAM, Mr. BOODBERG, Mr. MAH.

Preparation for the Major.—Required: Oriental Languages 12A-12B, 13, 17, 23A-23B, History 19A-19B and one of the following: Anthropology 2A-2B, Art 1D, Economics 1A-1B, Geography 1, 2 or 5A-5B, Political Science 1, 2. The language requirement, including part of the upper division work, may be satisfied by one year's intensive training in the Far Eastern and Russian Language School of University Extension, provided courses Oriental Languages 13 and 17 or their equivalents be included in the student's program.

The Major.—Required: 24 units consisting of the following: 8-12 units of upper division Chinese, Geography 125B; History 193A-193B or 194A-194B; Political Science 135, and one or more of the following: Economics 115, 190A,

Undergraduate Departments

190B, Geography 125A, History 192A, 192B, Oriental Languages 112A-112B, 100A-100B, Political Science 136, 138, Art 160A-160B. In addition, 6 units selected from upper division courses dealing with the Far East.

Regional Group Major on France and French Colonies

Advisers: Mr. FAY, Mr. PALM, Mr. RUSSELL.

Preparation for the Major.—Required: 16 units of French. (Minor shortages may be made up in the upper division.) Recommended: Economics 1A-1B; History 4A-4B; Political Science 1, 2.

The Major.—Required: One year upper division course in French; Economics 112; Geography 123A; History 134A-134B, 144A-144B or 145 and 146. Recommended: French 101A-101B, 134A-134B; Education 105; Political Science 123, 124, 127, 129, 185.

Regional Group Major on Germany and Central Europe

Adviser: Mr. KERNER.

Preparation for the Major.—Required: 16 units of German. (Minor shortages may be made up in the upper division.) Anthropology 2A-2B; History 4A-4B; Economics 10. Recommended: Philosophy 20A-20B; Political Science 1, 2.

The Major.—Required: One year upper division course in German; Economics 112; Geography 123A-123B; History 143A-143B, 147A; Political Science 147. Recommended: Economics 117A-117B; German 112; History 144A-144B or History 145 and 146.

Regional Group Major on Hispanic America

Advisers: Mr. MOSK, Mr. TORRES-RIOSECO.

Preparation for the Major.—Required: 10 units of Spanish and/or Portuguese; History 8A-8B. Recommended: Anthropology 2A-2B; Economics 1A-1B; Geography 1-2; History 4A-4B.

The Major.—Required: Spanish 104A-104B or 6 units of upper division Portuguese; History 161A-161B; Geography 122A or 122B; Anthropology 141 or 142. The remainder of the 30 units are to be selected from the following list of courses: Political Science 148, 149; Spanish 102, 113A, 113B; History 160A, 160B, 162A, 162B, 163, 166A, 166B; Economics 114, 190A, 190B; or from additional courses not used in the required group.

Regional Group Major on Japan

Advisers: Mr. BINGHAM, Mr. BOODBERG, Mr. BROWN.

Preparation for the Major.—Required: Oriental Languages 9A-9B (or the equivalent), 17; History 19A-19B, and one of the following: Anthropology 2A-2B, Economics 1A-1B, Geography 1-2 or 5A-5B, Political Science 1-2. The language requirement, including part of the upper division work, may be satisfied by one year's intensive training in the Far Eastern and Russian Language School of University Extension, provided course Oriental Languages 17 or its equivalent be included in the student's program.

The Major.—Required: 24 units consisting of the following: 8-12 units of upper division Japanese Geography 125B, History 195A-195B, Political Science 145; and one or more of the following: Economics 115, 190A, 190B, Geography 125, History 192A, 192B, 196A, 196B, Political Science 136, 138. In addition, 6 units selected from upper division courses dealing with the Far East.

Regional Group Major on Russia and Eastern Europe

Advisers: Mr. MASLENIKOV, Mr. KERNER.

Preparation for the Major.—Russian 1, 2, 18A–18B; History 4A–4B; and one of the following: Anthropology 2A–2B; Economics 1A–1B; Geography 1, 2 or 5A–5B; Political Science 1, 2.

The language requirement, including part of the upper division work, may be satisfied by two semesters' intensive training in the Far Eastern and Russian Language School of University Extension, provided Russian 103, or its equivalent, be included in the student's program.

The Major.—Required: 24 units comprising the following: Russian 103A–103B; History 135A–135B, or History 136A–136B; Geography 124; Political Science 141; two of the following—Slavic Languages 130, 180A or 180B, History 137A–137B. Recommended: Economics 110, 112, 190A–190B, 197; History 138A–138B; Political Science 142; Slavic Languages 131, 132, 150, 152, 134, 138, 133A–133B.

RELIGION

Students interested in the study of religion, either from the standpoint of liberal education, or of preparation for the ministry or some other phase of religious education, may select a major in one of the departments germane to the purposes of the student, or they may propose an individual group major (see page 72), or may elect a suitable combination of courses under the general curriculum (see pages 64, 70).

Courses appropriate for such purposes may be found in a number of departments, such as Anthropology, Classics, Economics, Education, English, History, Oriental Languages, Philosophy, Psychology, Semitic Languages, Sociology and Social Institutions, Social Welfare. Particular attention is directed to the following courses: History 122, 131A–131B; Near Eastern Languages 13A–13B, 102A–102B; Philosophy 104, 112.

THE RENAISSANCE

Group Major Adviser: Mr. CLINE.

Study of that period of European civilization whose chronological limits may be set between the Middle Ages and the Counter Reformation; or, more specifically, between the Age of Petrarch in Italy and that of Shakespeare in England.

Preparation for the Major.—Required: English 1A–1B, 46A; History 4A; Philosophy 20A–20B. Recommended: Music 30A; French 39A and a reading knowledge of Latin, French, German, Spanish, or Italian.

The Major.—Required: Art 176; English 117A, 117B, or 117E, 156; History 131A; Italian 151; Classics 178; and 6 or more units from the following: Classics 180B; French 109A, 118A; German 118B; History 131B; Philosophy 115, 116; Political Science 118A; Spanish 107A–107B, 111.

SCULPTURE

Group Major Adviser: Mr. SCHNIER.

Committee in Charge of the Major: Mr. PEPPER, Mr. SCHNIER, Mr. WELLINGTON.

A group major planned for students who seek a thorough understanding of the fundamental principles governing composition and design in sculpture. The proposed major is built around a nucleus of courses dealing with the elements of sculpture, its history, materials, and interrelation with the other arts.

Preparation for the Major.—Architecture 14 (4), Art 2A–2B or equivalent at discretion of instructor and Art 1A or 1B or 1C. The choice of alternates should be made in consonance with upper division courses.

The Major.—Twenty-four units of upper division work including Architecture 113 (4), 114 (4), art course from Group C (3), Decorative Art 180A (3), Philosophy 136A (3) and additional courses chosen from the following list to aggregate at least 7 units: Architecture 112 (1), 115 (1); art course from Group A (2); Decorative Art 180B (3); Philosophy 136B (3).

The attention of the student is directed to the following courses as important in relation to certain aspects of their field: Architecture 1, 5A, 5B, 5C; Decorative Art 127, 166.

SOCIAL WELFARE

Group Major Advisers: Mr. FRIEDLANDER, Mr. LOEB.

The group major in social welfare is designed to meet the needs of three classes of students:

- (a) Those who propose to take graduate professional training in social work, by providing for them an integrated program of preprofessional preparation for graduate study;
- (b) Those who look forward to positions in public assistance, social security administration, employment services, recreation, group work, correctional and other branches of the social services for which graduate training in social work is not now always required, by providing for them an orientation to the social services through a broad background in psychology and the social sciences;
- (c) Those who, having no specific vocational objectives, desire to become familiar with a wide range of social problems as a contribution to their general education, by offering them a general acquaintance with the contributions of psychology and several fields of social science.

Preparation for the Major.—Required: Economics 1A–1B; Psychology 1A and 1B or 2; Economics 2 or Psychology 5; and History 4A–4B.

The Major.—Required: 36 units of upper division work, including (a) the following courses, to the value of 13 units: Social Welfare 102, 104, 105, 110A–110B; (b) the following courses, to the value of 23 units, provided that, with the approval of the faculty adviser, not more than 12 units of upper division courses be substituted: Economics 130A, 150, 180, 185; Political Science 150, 181; Psychology 160, 162.

Besides these required courses a number of other lower division and upper division courses are strongly recommended. The advisers will provide students with lists of the recommended courses.

Students who have completed the major successfully, and who have established their eligibility for admission in full graduate standing, will have fulfilled the requirements for admission to the School of Social Welfare, as well as the prerequisites imposed by practically all other university schools of social work.

WILDLIFE CONSERVATION

Group Major Adviser: Mr. LEOPOLD.

The curriculum in wildlife conservation leading to an A.B. degree is designed to offer sound, basic training for students professionally interested in fish and game management and research. Emphasis is placed upon an adequate foundation in the basic sciences.

Training in this curriculum meets the minimum requirements for various positions as fish or game managers or as wardens with such federal agencies as the Fish and Wildlife Service, Park Service, Forest Service, and Soil Conservation Service, and with state agencies such as the divisions of Fish and Game, Forestry, and Public Health. Likewise certain beginning positions as field or laboratory biologists are open to the recipient of the A.B. degree. The great collections of the University of California Herbarium and the California Museum of Vertebrate Zoölogy supplement the local flora and fauna as reference materials in botany and zoölogy.

To become adequately prepared as a professional fish or game biologist, however, the student should pursue further study leading to the M.A. or Ph.D. degree. The same is true of students who may wish to teach biology and conservation in high schools or junior colleges. The higher degree may be taken in the Department of Zoölogy at Berkeley or at some other university.

Preparation for the Major.—Lower Division. Required: Botany 1; Chemistry 1A and 8; Engineering 1A or 21; Geology 1; Mathematics C or 3A; Public Health 160A or Economics 2 or Mathematics 12; Zoölogy 1A-1B. Recommended: Agricultural Economics 1; Economics 1A-1B; Geography 1 or 4; Physics 2A-2B, 3A-3B; Physiology 1-1L.

The Major.—Required: Botany 108; Forestry 101 and 103; Entomology 114 or 133; Poultry Husbandry 106; Zoölogy 111 or Entomology 117; Zoölogy 113, 116 and 125; Zoölogy 138 or 145. Recommended: Biochemistry 103; Forestry 102, 125, 104, 108; Geography 153; Physiology 100A or 100B; Soil Science 100 or 101 or 116; Zoölogy 100, 106, 114, 125C.

LETTERS AND SCIENCE LIST OF COURSES

At least 108 units offered for the degree of Bachelor of Arts must be in courses chosen from the Letters and Science List of Courses.

Thirty-six units of *upper division courses*, selected from the following list, must be completed after the student has attained upper division standing.

Any upper division course, either required or accepted as part of a major or upper division curriculum authorized for the A.B. degree, will, for students offering such major or curriculum for graduation, be considered as fulfilling this requirement.

- | | |
|--|--|
| Agricultural Economics 100, 112A, 112B, 116. | Chemistry and Chemical Engineering. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149. |
| Anatomy. All undergraduate courses. | Classics. All undergraduate courses. |
| Anthropology. All undergraduate courses. | Decorative Art. All undergraduate courses. |
| Architecture 5A, 5B, 5C, 5D, 6A, 6B, 6C, 6D, 14, 113, 114, 117, 120A, 120B, 146, 148A, 148B. | Dramatic Art. All undergraduate courses except 190, 191, 192, 193. |
| Art. All undergraduate courses. | Economics. All undergraduate courses. |
| Astronomy. All undergraduate courses except 3, 11, and 114. | Education 108, 110 and not more than 3 units from 101, 102, 105. |
| Bacteriology. All undergraduate courses. | English. All undergraduate courses. |
| Biochemistry. All undergraduate courses. | Entomology 1, 106, 112, 127, 129. |
| Botany. All undergraduate courses. | Forestry 1, 103, 125. |
| Business Administration 1A, 1B, 10, 100, 150. | French. All undergraduate courses. |

- Genetics. All undergraduate courses except 104.
- Geography. All undergraduate courses.
- Geological Sciences. All undergraduate courses except 114.
- German. All undergraduate courses.
- Greek. All undergraduate courses.
- History. All undergraduate courses.
- Home Economics 1A, 1B, 6, 10, 14, 101A, 101B, 111, 112A, 112B, 114, 118A, 118B, 132, 134, 137, 142, 160, 152.
- Italian. All undergraduate courses.
- Journalism 120A, 120B, 140, 141, 190.
- Latin. All undergraduate courses.
- Mathematics. All undergraduate courses except 107, 122, 142A, 142B, 142C, 142D, 144.
- Medico-Military Science and Tactics 121A, 121B.
- Military Science and Tactics. A total of not more than 8 units of lower division courses.
- Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 25, 55, 125, 155.
- Naval Science. A total of not more than 8 units of lower division courses.
- Near Eastern Languages. All undergraduate courses.
- Optometry (see Physiological Optics, below).
- Oriental Languages. All undergraduate courses.
- Paleontology. All undergraduate courses.
- Philosophy. All undergraduate courses.
- Physics. All undergraduate courses except 129 (Davis).
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Pathology 121.
- Political Science. All undergraduate courses except 163, 164, 165, 166, 167A, 167B, 168A, 168B, 169, 183.
- Psychology. All undergraduate courses except 3, 104, 116, 117, 144, 185, 186.
- Public Health 5A, 5B, 35, 106, 160A, 160B, 163A, 163B.
- Sanskrit. All undergraduate courses.
- Scandinavian Languages and Literature. All undergraduate courses.
- Slavic Languages. All undergraduate courses.
- Social Welfare 100, 101A, 101B, 106, 110A, 110B.
- Sociology and Social Institutions. All undergraduate courses.
- Soil Science 110, 111, 112, 113, 114, 115.
- Spanish and Portuguese. All undergraduate courses.
- Speech. All undergraduate courses.
- Zoölogy. All undergraduate courses except 109 and 145.

HONORS

Honors are granted only with the bachelor's degree; honorable mention is given with the Associate in Arts degree. Honor students in the upper division are those who meet the following conditions:

- (a) Students who have received honorable mention with the degree of Associate in Arts (or junior standing) and who are in their first semester of the upper division;
- (b) Upper division students who have an average of at least 2 grade points for each unit of undergraduate work undertaken at the University of California.
- (c) Other upper division students specially approved for listing in the honors status by the Committee on Honors, either on recommendation made to the Committee by departments of instruction, or on such other basis as the Committee may determine.

Any department is authorized to post a departmental honors list on its bulletin board at the beginning of a semester. Copies are sent by the departments to the Committee on Honors and to the Registrar.

Each department has freedom in determining the most efficacious method for the training of honor students.

Departments may offer special honors courses in reading and research with credit to be determined by the instructors in charge, according to the performance of the individual students, subject to such general restrictions as may be imposed by the department, the college, or the Committee on Courses of Instruction of the Northern Section of the Academic Senate. The work of the student in such an honors course may consist of additional work in connection with regular courses of instruction, or may be independent of such courses.

Special honors courses may not be taken by a student whose name is not on the honors list of the college in which he is registered except with the consent of the Committee on Honors.

Credit in a special study course for undergraduates may not exceed 5 units a semester.

At the discretion of the Dean, an honor student may make study-list changes involving honors courses under suspension of the regulations fixing the time during which such changes are ordinarily permissible and of the rules requiring fees for such changes, but if this is done, the student is expected to complete the reorganization of his program with all possible diligence, and to report promptly to the Dean concerning proposed changes.

Honor students may have (subject to the approval of the instructor concerned) the privilege of taking each semester one course not offered by the student in satisfaction of requirements for the major and not related to the field of the major, in which they will be marked "passed" or "not passed." Units gained in this way will be subtracted from the units required for graduation for which grade points are recorded. The status of a course taken on the "passed" or "not passed" basis may not be changed after the last day on which the student is permitted to add a course to the study list.

Honor students who have senior standing and have attained at least a B average in the junior year at the University of California have the following additional privileges:

- (a) The study-list total may be less than 12 units.
- (b) The number of units in upper division (or graduate) courses required after admission to the upper division may be less than 36.
- (c) The number of upper division units which may be taken in one department after admission to the upper division may exceed 30.
- (d) With the consent of the major department, requirements concerning specific courses or sequences in the major may be set aside.

Except as specifically provided, all existing regulations for students in the upper division apply to honor students.

Honors with the Bachelor's Degree

Honors at graduation are granted to those students only who have completed a major or the general (nonmajor) curriculum with distinction, and who have a general record satisfactory to the Committee on Honors.

Before Commencement each department and also the major adviser for each group major determine, by such means as they may deem best (for example, by means of a general final examination), which students are to be recommended to the Dean of the College for honors at graduation.

Students who, in the judgment of proper authorities, display marked superiority may be recommended for the special distinction of highest honors.

The Committee on Honors will consider recommendations from the department, the group major advisers, and the Dean, confer with the several recommenders about doubtful cases, and transmit to the Faculty of the College of Letters and Science its recommendations concerning the award of Honors and Highest Honors.

The list of students to whom honors or highest honors in the various departments have been awarded is published in the annual COMMENCEMENT PROGRAMME.

COLLEGE OF AGRICULTURE

The prospective student should read the requirements and recommendations for admission on pages 25-35. Entrants will be seriously handicapped in undertaking the lower division courses required in the various curricula of the College of Agriculture unless they have completed the following subjects in high school: algebraic theory, $\frac{1}{2}$ or 1 unit; trigonometry, $\frac{1}{2}$ unit; physics, 1 unit; and chemistry, 1 unit. Students proposing to major in landscape design, agricultural engineering, or forestry should have in addition 1 unit of geometrical drawing. Failure to take the proper subjects in high school may delay completion of the University course beyond the usual four-year period.

More detailed information concerning instruction in the College of Agriculture (at Berkeley, Davis, and Los Angeles) may be found in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, obtainable without charge, from the Dean of the College of Agriculture, University of California, Berkeley 4, California.

Requirements for the Degree of Bachelor of Science

The degree of Bachelor of Science is awarded to those candidates who:

1. Satisfy the general University requirements as follows:

- (a) *Subject A.*—The Subject A examination in English composition is required of every undergraduate student at the time of his first registration in the University (see page 38).
- (b) *Military or Naval Science* (for male students; see page 40).
- (c) *American History and Institutions.*—The student may meet this requirement by the passing of an examination in American History and

Institutions or by completion of courses prescribed by the University (see page 39).

- (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
 (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.

2. Satisfy the general requirements of the College of Agriculture as follows:

- (a) *At least 124 units of University work.* Not more than 4 units may be in lower division physical education courses.
 (b) *Thirty-six units of the above total must be in upper division courses* (courses numbered 100-199).
 (c) *Nine units of mathematics including trigonometry.* Matriculation work may be offered toward this requirement, counting each year of high school work as 3 units. The student normally satisfies this requirement before the end of his sophomore year.

3. Satisfy the requirements of one of the following curricula in the College of Agriculture.

(a) CURRICULUM IN AGRICULTURAL ECONOMICS

Bacteriology, botany, chemistry, geology, physics, physiology, zoölogy, or additional mathematics*	18 units
*Mathematics	6
English or speech	6
Business administration or economics	15
Anthropology, geography, history, philosophy, political science, psychology, or sociology and social institutions	12
Agriculture	15
Military science	8
	80 units

(b) At least 15 units of upper division work in agricultural economics, selected with the approval of the major adviser. One course in statistics is required, which course may also be used to satisfy other requirements.

CURRICULUM IN AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

(a) Required:

Chemistry	13 units
Physics	6
Botany, zoölogy, and/or bacteriology	12
Soil science or geology	3
Genetics	4
Economics	6
English and/or speech	6
Business administration, sociology, history, political science, or additional economics	5
Military science	8
	63 units

* This requirement is not satisfied by Mathematics 2 or mathematics courses designated by letters, such as Mathematics T, C, D, E, G.

Undergraduate Departments

(b) In addition, 50 units of work in agriculture selected with the approval of the major adviser, including at least 15 units of animal science, 15 units of plant science, 8 units of agricultural engineering, and 6 units of agricultural economics.

Certain courses are required by the following majors:

Agricultural Education.—Psychology 1A or an equivalent course and Education 160 are required in this major.

Soils 106 or an equivalent course in soils must be completed under requirement (a) or (b).

General Agriculture.—Soils 106 or an equivalent course in soils must be completed under requirement (a) or (b).

The CURRICULUM IN AGRICULTURAL ENGINEERING is offered in the College of Engineering. See page 107.

CURRICULUM IN ANIMAL SCIENCE

(a)		
	Chemistry, including biochemistry	16 units
	Botany	4
	Physics	6
	Economics	6
	English	3
	Genetics	4
	Bacteriology	4
	Animal nutrition	3
	Animal physiology	5
	Animal pathology or parasitology	3
	Zoölogy	10
	Geology or soils	3
	Military science	8
		75 units

(b) A minimum of 12 units of upper division work in one of the following divisions, or in a closely related division, selected with the approval of the major adviser: animal husbandry, poultry husbandry, and genetics.

Certain courses are required by the following majors:

Animal Husbandry.—Animal Husbandry 7, 8, 102, and 103 are required in this major. Animal Husbandry 103 satisfies the animal nutrition requirement. Animal Husbandry 101 or Poultry Husbandry 106 are required but may be counted as part of the 16 chemistry units required of all students. Chemistry 1A, 1B, and 8 are required in this 16 units.

Poultry Husbandry.—Majors in this subject are required to take Poultry Husbandry 1. Either Poultry Husbandry 106 or Animal Husbandry 101 should be taken as part of the curricular requirements in biochemistry. Poultry Husbandry 104 will satisfy the animal nutrition requirement.

CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY	
(a)	
Chemistry	13 units
Agriculture and/or forestry, other than entomology and parasitology	6
Botany and zoölogy	20
Bacteriology	4
English and/or speech	6
Genetics	3
Mathematics* and/or physics	6
Plant or animal physiology or nutrition or biochemistry	3
Plant or animal pathology	4
Geography, geology, or paleontology	3
Military science	8
	76 units

(b) The summer practice course, Entomology and Parasitology 49.

(c) At least 23 units in entomology and parasitology courses in addition to course 49, selected with the approval of the major adviser. (Courses 1, 106, 112, and 127 should be included.)

CURRICULUM IN FOOD SCIENCE	
(a)	
Chemistry	19 units
Microbiology	8
Botany or zoölogy	5 or 3
Physics (including laboratory)	8
Biochemistry and/or physiology	6
Mathematics (including differential calculus)	6
Speech and/or English	6
Economics	6
Military science	8
	72 or 70 units

(b) Six units of course work in production fields of agriculture. A summer practice course may be required.

(c) In addition, at least 20 units of courses in one of the following majors: dairy industry, enology, or food technology. A limited number of allied subjects, selected with the approval of the major adviser, may apply to this requirement.

Certain courses are required by the following majors:

Dairy Industry.—Animal Husbandry 103 and 108; Chemistry 1A, 1B, 5, and 8; Dairy Industry 1, 2, 49, 160A, 160B.

Enology.—Agricultural Engineering 102; Botany 1 and 7; Chemistry 1A, 1B, 5, 8, and 101 or 111; Horticulture 2, 116, 105v, 130A, 130B, 120A, 120B, 140, and 141.

Food Technology.—Bacteriology 1; Chemistry 1A, 1B, 5, 8, and 109; Food Technology 112, 113, 114, 115, and 127.

* Analytic geometry and calculus, statistics or biometry.

Undergraduate Departments

(a) CURRICULUM IN PREFORESTRY†

Botany (general botany).....	5 units
Chemistry (general inorganic and organic).....	8
Engineering (plane surveying).....	6
Economics (elements of economics).....	6
Geology (structural).....	3
Mathematics (analytic geometry and differential calculus)...	6
Physics (general physics with laboratory).....	8
Statistical methods.....	3
Zoology (general biology).....	3
Speech, English, or philosophy.....	6
Military science.....	8

62 units

(b) For admission to the School of Forestry, a student must have junior standing with at least 60 units of credit, including the prescribed subjects listed above, have a grade average of C or higher, and have attended the summer forestry field practice courses, Forestry 49A-49B.

(a) CURRICULUM IN HOME ECONOMICS

Chemistry.....	8 units
Economics.....	6
Psychology.....	3
Bacteriology (including laboratory).....	4
Physiology.....	3
English or speech.....	6
Public health, botany, or zoology.....	3
Statistics.....	3

36 units

(b) At least 36 units of upper division work distributed among the allied fields of home economics, and chosen with the approval of the major adviser. (These will, ordinarily, consist chiefly of upper division home economics courses.)

Required courses for each of the majors are as follows:

General Home Economics Major:

Home Economics 1A-1B, 6, 7, 112A-112B, 132 (or Psychology 112), 133, 140, 141 (or 142), 144, 162, 175; Decorative Art 16A-16B, 130A; Architecture 110.

Child Development Major:

Home Economics 1A-1B, 112A-112B, 132 (or Psychology 112), 133, 134 (or Public Health 121), 135, 435; Psychology 160, 162; Physiology 102.

Clothing and Textiles Major:

Home Economics 6, 7, 141, 160, 162, 175, 176; Decorative Art 16A-16B, 175A, 175B, 176A, 193A-193B.

† More detailed information concerning the School of Forestry is contained in the ANNOUNCEMENT OF THE SCHOOL OF FORESTRY, which is available without charge from the College of Agriculture, University of California, Berkeley. Also see statement concerning SCHOOL OF FORESTRY, page 131.

Family Economics Major:

Home Economics 6, 100, 140, 141, 142, 144, 162; 6 to 9 units of upper division economics or business administration selected upon consultation with the major adviser.

Food Chemistry and Technology Major:

Home Economics 1A-1B, 100, 101A-101B, 114, 118A-118B, 141 (or Agricultural Economics 101A or Business Administration 160); Chemistry 1B; Biochemistry 103; Physiology 1L; 4 units of food technology courses.

Nutrition and Dietetics Major:

Home Economics 1A-1B, 100, 101A, 114, 115, 118A-118B, 141 (or Agricultural Economics 101A or Business Administration 160); Chemistry 1B; Biochemistry 103; Physiology 1L.

(a) CURRICULUM IN LANDSCAPE DESIGN	
General botany	4 or 8 units
English or speech	6
*Art and architecture	27
Economics	6
Civil engineering (surveying).....	3
Social institutions, history, philosophy, or political science...	6
Engineering (other than surveying), geology, mathematics, or agriculture (other than landscape design).....	6
Military science	8

66 or 70 units

(b) The summer practice course, Landscape Design 49.

(c) At least 30 units of courses in the Division of Landscape Design in addition to course 49, selected with the approval of the major adviser. (Courses 1A, 1B, 101A, 101B, and 114A or 114B should be included.)

(a) CURRICULUM IN PLANT SCIENCE	
Chemistry (may include biochemistry).....	16 units
Botany and plant physiology.....	9
English and/or speech.....	6
Physics	6
Bacteriology	4
Economics	3
Genetics	4
Soils and/or irrigation	6
Plant pathology	4
Entomology	4
Zoölogy	3
Military science	8

73 units

(b) A minimum of 12 units of upper division work in one of the following majors or in a closely related major, selected with the approval of the major adviser: agronomy, genetics, general horticulture, irrigation, ornamental horticulture, plant pathology, pomology, subtropical horticulture, truck crops, and viticulture.

* The following decorative art courses will be accepted in partial satisfaction of this requirement: 16A, 16B, 26A, 26B, 160A, 160B, and 166, with consent of adviser.

The plant science curriculum with majors in general horticulture, ornamental horticulture (including floriculture), and subtropical horticulture are offered on the Los Angeles campus. For detailed information, consult the PROSPECTUS OF THE COLLEGE OF AGRICULTURE and the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES.

(c) A summer practice course of six weeks may be prescribed, in addition to the above, as a major requirement.

Certain courses are required by the following majors:

Irrigation: Chemistry 1A, 1B, 5, and 8; Botany 1 and 7; Mathematics 3A and 3B; Physics 2A and 2B; Engineering 1A; Agronomy 110; Irrigation 100, 110, 130.

Pomology: Chemistry 1A, 1B, 5, and 8; Botany 1 and 7; Agricultural Engineering 103; Agronomy 110; Horticulture 2, 105P, 106A, 106B, 112, and 121.

Viticulture: Chemistry 1A, 1B, 5, and 8; Botany 1, 7, and 105; Agricultural Engineering 103; Agronomy 110; Horticulture 2, 116, 105V; Horticulture 112 and 121 or Horticulture 120A and 120B.

(a) CURRICULUM IN SOIL SCIENCE

Mathematics (analytic geometry and calculus).....	6 units
Chemistry (including physical chemistry).....	19
Physics (including laboratory).....	8
Botany (including plant physiology).....	12
Bacteriology	4
Mineralogy	3
Economics	6
Geology (including petrology).....	6
English and/or speech	6
Military science	8

78 units

(b) At least 24 units in soil science, selected with the approval of the major adviser.

(c) A summer field course may be prescribed in addition to the above, as a major requirement.

CURRICULUM IN PREVETERINARY SCIENCE*

English composition and additional English or speech.....	6 units
Chemistry (general, inorganic, and organic).....	13
Zoölogy (including embryology).....	10
Physics (mechanics, heat, light, electricity).....	6
Statistics	3
Restricted electives†	12
Electives	10
Military science	8

68 units

* More detailed information concerning the School of Veterinary Medicine is contained in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, which is available without charge from the College of Agriculture, University of California, Berkeley 4, California. Specific questions should be directed to the Dean, School of Veterinary Medicine, College of Agriculture, University of California, Davis, California.

† Courses selected from the fields of social sciences, foreign languages, philosophy, psychology, fine arts, and literature, and/or additional courses in English, speech, and mathematics.

Freshman and Sophomore Years

The student is required to consult his major adviser each semester for guidance in following the curriculum requirements of his choice. No Associate in Arts degree is given in the College of Agriculture. Students who are unable to meet the suggested programs of study during the first two years may take some of the requirements in their junior or senior years. It should be noted, however, that any great departure from the recommended programs may delay graduation beyond the normal four-year period.

The following programs of study are normally taken in the freshman and sophomore years, and are examples for the Berkeley campus only. College requirements for graduation are the same whether the student registers at Berkeley, Davis, or Los Angeles, except that 4 units of physical education are required as a condition of residence at Los Angeles. Programs are limited to a minimum of 12 units and a maximum of 18 units per semester. Any deviation from this limitation requires special permission of the Dean of the College.

For further information, see the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, which may be obtained without charge from the Dean of the College of Agriculture, University of California, Berkeley 4.

AGRICULTURAL ECONOMICS

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2	Military Science	2	2
Chemistry 1A, 8	5	3	Business Adm. 1A-1B	3	3
Economics 1A-1B	3	3	Mathematics 3A-3B	3	3
English 1A-1B or Speech 1A-1B	3	3	Economics 2	3	3
Zoölogy 10	3	..	Agricultural Economics 1.	3	..
Botany 12 . . . . .	..	4	Geology 1	3	..
			Animal Husbandry 7 . . . . .	..	3
			Elective	3	3
	<hr/>	<hr/>		<hr/>	<hr/>
	16	15		17	17

AGRICULTURAL EDUCATION

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Physics 2A-2B	3	3
Botany 1	5	..	Bacteriology 2 . . . . .	..	4
English 1A . . . . .	..	3	Economics 1A-1B	3	3
Horticulture 2	3	..	Poultry Husbandry 1	3	..
Animal Husbandry 7 . . . . .	..	3	Zoölogy 1A	4	..
Elective . . . . .	..	3	Chemistry 8 . . . . .	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	15	16		15	15

Undergraduate Departments

ANIMAL SCIENCE

<i>Freshman Year</i>		<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2	Military Science	2
Chemistry 1A-1B	5	5	Chemistry 8	3
Physics 2A-2B	3	3	Bacteriology 2	4
English 1A	3	3	Economics 1A-1B	3
Geology 1	3	..	Zoology 1A-1B	4
Poultry Husbandry 1	3	..	Botany 1	5
Elective .....	..	3	Physiology 1	3
			Physiology 1L	2
	<u>16</u>	<u>16</u>		<u>17</u>
				<u>18</u>

ENTOMOLOGY AND PARASITOLOGY

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2
Chemistry 1A-1B	5	5	Zoology 1A-1B	4
Botany 1	5	..	Entomology 1	4
English 1A-1B or Speech 1A-1B	3	3	Chemistry 8	3
Elective .....	..	4	Physics 10	3
			Bacteriology 2	4
	<u>15</u>	<u>14</u>	Electives	3
				<u>8</u>
				<u>16</u>
				<u>16</u>

FOOD TECHNOLOGY

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2
Chemistry 1A-1B	5	5	Physics 2A-2B	3
Botany 1	5	..	Physics 3A-3B	1
Agricultural Engi- neering 12 .....	..	2	Chemistry 8, 5	3
Speech 1A-1B	3	3	Bacteriology 1	5
Economics 1A .....	..	3	Mathematics 3A-3B	3
			Economics 1B	3
	<u>15</u>	<u>15</u>		<u>15</u>
				<u>17</u>

PREFORESTRY

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2
Chemistry 1A, 8	5	3	Physics 2A-2B	3
Geology 1	3	..	Physics 3A-3B	1
Speech 1A-1B or English 1A-1B	3	3	*Engineering 1A-1B	3
Zoology 10 .....	..	3	Economics 1A-1B	3
Mathematics 3A-3B	3	3	Botany 1	5
			Statistics	3
	<u>16</u>	<u>14</u>		<u>17</u>
				<u>15</u>

* One year of geometrical drawing and one-half year of trigonometry are prerequisite to engineering and also necessary for forestry courses. They should be taken in high school. The University does not offer a course in geometrical drawing.

†HOME ECONOMICS

<i>Freshman Year</i>		<i>Sophomore Year</i>			
	<i>Fall Units</i>	<i>Spring Units</i>	<i>Fall Units</i>	<i>Spring Units</i>	
Chemistry 1A, 8	5	3	Physiology 1	3	..
English 1A-1B or Speech 1A-1B	3	3	Home Economics 1A-1B..	3	3
Public Health 5A or Zoölogy 10	3	..	Psychology 1A	3	..
Decorative Art 16A-16B..	2	2	Economics 1A-1B	3	3
Bacteriology 2 .....	..	4	Home Economics 6, 7....	3	3
Home Economics 12.....	2	..	Economics 2 or Psy- chology 5 .....	..	3
Electives .....	..	4	Elective .....	..	4
	<hr/> 15	<hr/> 16		<hr/> 15	<hr/> 16

LANDSCAPE DESIGN

<i>Freshman Year</i>		<i>Sophomore Year</i>			
Military Science	2	2	Military Science	2	2
Botany 12.....	..	4	Architecture 4 .....	..	4
Art 2A-2B or Decorative Art 16A-16B	2	2	Architecture 12	1	..
English 1A-1B or Speech 1A-1B	3	3	Architecture 18	1	..
Architecture 1, 2	3	3	Engineering 21 .....	..	3
Economics 1A-1B	3	3	Art 2A or Decorative Art 16A	2	..
Elective	3	..	Landscape Design 1A-1B.	3	3
	<hr/> 16	<hr/> 17	Landscape Design 2	2	..
			History 17A-17B	3	3
			Electives	3	2
				<hr/> 17	<hr/> 17

PLANT SCIENCE

<i>Freshman Year</i>		<i>Sophomore Year</i>			
Military Science	2	2	Military Science	2	2
Botany 1.....	5	..	Chemistry 8, 5.....	3	3
Chemistry 1A-1B	5	5	Zoölogy 1A	4	..
Physics 2A-2B	3	3	Bacteriology 1.....	..	5
Physics 3B .....	..	1	English 1B or Speech 1B..	..	3
English 1A or Speech 1A..	..	3	Geology 1.....	3	..
Elective .....	..	3	Elective	3	3
	<hr/> 15	<hr/> 17		<hr/> 15	<hr/> 16

† This is a suggested program for the general home economics major only. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, obtainable without charge from the College of Agriculture, Berkeley 4, for suggested programs in other majors in home economics.

Undergraduate Departments

SOIL SCIENCE

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Chemistry 8, 5	3	3
Chemistry 1A-1B	5	5	English 1A-1B or Speech 1A-1B	3	3
Physics 2A-2B	3	3	Geology 1	3	..
Physics 3A-3B	1	1	Bacteriology 1 . . . . .	..	5
Electives	2	6	Mineralogy 4A	3	..
			Mathematics 3A-3B	3	3
	<hr/>	<hr/>		<hr/>	<hr/>
	18	17		17	16

PREVETERINARY SCIENCE

<i>Freshman Year</i>			<i>Sophomore Year*</i>		
Military Science	2	2	Military Science	2	2
English 1A	3	..	Chemistry 8	3	..
English 1B or Speech 1A	3	3	Zoölogy 1A-1B	4	4
Chemistry 1A-1B	5	5	Statistics . . . . .	..	3
Physics 2A-2B	3	3	Elective . . . . .	..	3
†Electives	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		15	15

Junior and Senior Years

The schedule for the junior and senior years is determined by the major subject requirements, supplemented by optional courses selected by the student, with the advice and consent of the major adviser.

Approval of Study Lists

The study lists of all students must be endorsed by the major subject adviser, and approved by the Dean or Assistant Dean of the College of Agriculture, before it may be filed with the Registrar.

Honors

Honorable mention with junior standing.—Students who have completed 62 units of approved work in a curriculum of the College of Agriculture will have attained junior standing.

Honorable mention is granted with junior standing to students who acquire at least an average of two grade points for each unit of credit undertaken. These students will remain in honors status unless their average at the end of any semester falls below two grade points for each unit of credit undertaken.

† See list of restrictive electives on page 94.

* At Berkeley, Zoölogy 100 must be taken in Summer Session following completion of Zoölogy 1A-1B.

Honors with the bachelor's degree.—Honors at graduation are granted to the graduating student who has completed his major with distinction and whose general record is satisfactory to the Study-Lists Committee. The student who has done work of unusual excellence may be recommended for highest honors.

The list of students to whom honors or highest honors in the College have been awarded is published in the COMMENCEMENT PROGRAMME.

COLLEGE OF CHEMISTRY

Preparation.—Students who propose to enter the College of Chemistry must include in their high school programs physics (1 unit), chemistry (1 unit), mathematics including trigonometry and two years of algebra ($3\frac{1}{2}$ units), German or French (2 units). It is recommended also that solid geometry ($\frac{1}{2}$ unit), geometrical drawing, and further work in German or French be included. Students with serious deficiencies in this preparation will ordinarily not be allowed to enroll in the College of Chemistry.

Approval of programs.—Students in the College of Chemistry are required to submit their proposed schedules to their advisers. A list of the advisers in the College of Chemistry is posted on the bulletin board in Gilman Hall. It is desirable that a complete schedule of courses, chosen with a definite purpose and free from conflicts, should be arranged at the earliest possible date.

Graduation.—The degree of Bachelor of Science is granted upon the completion of a curriculum approved by the Study-Lists Committee of the College of Chemistry. The equivalent of four years of residence and 124 units, including not more than 6 units of upper division military science, are minimum requirements. Unless the student in his first two years completes the normal sophomore requirements, additional units, or a further semester of residence, or both, will be required. The student must have obtained at least as many grade points as there are units of credit in all courses which he has taken in the University. The first two years may be completed in a junior college or in any college or university of approved standing.

Study-list limits.—Ordinarily, students will not be permitted to enroll for fewer than 12 or more than 17 units a semester.

Language requirement.—A reading knowledge of scientific German is essential before the work of the junior year is undertaken. The student is urged to acquire also a reading knowledge of French. Reasonable proficiency in the use of English is a requirement for graduation in the College of Chemistry. The determination of proficiency and the enforcement of the requirement are administered by the Dean of the College in coöperation with a committee appointed by him. Any student whose oral or written English is unsatisfactory will be notified not later than the end of his junior year. The committee, in conference with the student so notified, will outline a program of study designed to correct the deficiency.

Honor students in the upper division.—Students who in the first two years of their college work have attained an average of at least two grade points for each unit undertaken will receive honorable mention with junior standing. These students are entitled to register as candidates for honors. After the first semester of the junior year, the Committee on Honors of the College of Chemistry will determine which students shall remain in the honors group and which students shall be promoted thereto. Honor students will be given a larger share of personal instruction and a greater opportunity to choose courses and work within courses, in the manner best suited to individual needs and aims. Students not in the honors group will not, except in unusual circumstances and with the express permission of the instructor, be permitted to enroll for honors courses (marked H) or for undergraduate research. Students in the basic chemistry major will not ordinarily be recommended for honors at graduation unless their work includes courses 114H and 180H or other advanced courses approved by the Committee. Subject to the approval of the study-list adviser and of the instructor in the course concerned, students in honors status have the privilege of taking each semester one course not offered by them in satisfaction of subject requirements for the curricula of the College of Chemistry in which they shall be marked "passed" or "not passed." In calculating the grade-point standing units gained in this way are not counted. Students in the honors group should confer with Professor Orlemann, Chairman of the Committee on Honors of the College of Chemistry, 105 Lewis Hall, with respect to their plans for the last two years of college work. The list of students upon whom honors and highest honors are conferred appears in the annual COMMENCEMENT PROGRAM.

Specific requirements.—Before graduation the following specific requirements must be satisfied:

- (a) Mathematics 3A, 3B, 4A, 4B or 14A, 14B.
- (b) Physics 4A, 4B, 4C.
- (c) Chemistry 1A, 1B, 5, 12A, 12B, 110A, 110B, 111, and at least 6 additional units of advanced quantitative analysis or advanced inorganic chemistry.
- (d) A reading knowledge of German.
- (e) The general University requirements in military science, American History and Institutions.

Freshman year.—Students with normal preparation will complete the following program: Subject A,* military science, Chemistry 1A-1B, Physics 4A, German 1-2, and Mathematics 3A-3B. Students with high school preparation in German may take German 3S, 4S or substitute free electives such as English 1A-1B, Speech 1A-1B, or Economics 1A-1B, and students with high records in mathematics may take Mathematics 3 and 4A.

* For regulations concerning Subject A, see page 38.

Sophomore year.—In order to attain full junior standing the program for the second year should include military science (4 units), Mathematics 4A–4B, Physics 4B, and Chemistry 5, a total of 17 units, and at least 10 units chosen from the following list: Physics 4C, Chemistry 12A, 12B, 105 and 110A. It is desirable for students to complete Chemistry 5 in the first semester of the sophomore year. Students preparing for chemical engineering are advised to elect Engineering 22 and 23.

Upper division.—In addition to completing the specific requirements (a) to (e) listed above, each student shall complete either the major in basic chemistry or the curriculum in chemical engineering.

Major in Basic Chemistry

This program offers a wide latitude of individual choice which will enable the student to prepare for graduate study or directly for industrial employment in laboratory syntheses, quality control, research on physical and chemical properties of materials, product development, chemical marketing, or for high school teaching of chemistry. Students receiving the degree of Bachelor of Science with Honors are in a position to continue graduate study in preparation for the highest type of fundamental research. A sequence of electives must be chosen in accordance with some comprehensive plan and each program must be approved by the study-list officer of the College of Chemistry. Such programs will normally include a group of upper division courses totaling 24 units, of which half may be taken in closely related departments. Thus a student preparing for research in the field of physical chemistry should include at least 6 units of upper division courses in physics and 6 in mathematics. A course leading to research in organic chemistry should include work in biochemistry, bacteriology, or physiology. A course preparing for quality control may include work in electronics, optics, introductory chemical engineering, and practice in analytical techniques developed for various technological fields. Students are also encouraged to include one or more carefully selected electives from departments not closely related to chemistry.

Curriculum in Chemical Engineering

This curriculum equips the student for professional work in the development, design, and operation of chemical processes and of process equipment. It includes the subjects common to all engineering curricula, together with thorough fundamental training in chemistry, and specialized advanced courses in chemical engineering. Restricted electives are provided during the senior year to orient each student toward particular types of work and particular industries. Additional training is offered at graduate level, leading to the M.S. and Ph.D. degrees in chemical engineering. Although frequently it will not be possible to conform to the semester schedules shown below, completion of the listed subjects is required for graduation in the chemical engineering curriculum.

Undergraduate Departments

Junior Year			Senior Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Chemistry 12B	5	..	Chemistry 144, 146B.....	6	..
Chemistry 110B, 111.....	3	3	Chemistry 104† .....	..	3
Chemistry 143, 146A.....	3	3	Chemistry 145A-145B ...	2	2
Engineering 23, 35.....	5	..	Metallurgy 152 (or 150A).	2	..
Mechanical Eng. 105A**..	..	3	Electrical Eng. 101.....	3	..
Civil Eng. 108A .....	..	3	Electives	3	8
Math. 110 (or 119A)*....	..	4			
	16	16		16	18

Senior electives in this curriculum will normally be chosen from each of the following groups:

Courses relating to unit operations and to equipment design: Chemistry 122, 149, 180H, 216, 244; Engineering Design 102B, 106; Mechanical Engineering 161, 164; Electrical Engineering 105, 106; Metallurgy 108, 110A, 150B, 170A, 174; Mathematics 130A.

Courses relating to chemical processes: Chemistry 101, 120, 123, 147, 180H; Bacteriology 1 or 2, 105; Food Technology 112A, 112B, 115A, 115B; Forestry 115; Metallurgy 102; Civil Engineering 111B, 109B; Petroleum Engineering 117, 119; Ceramic Engineering 100, 198.

Engineering laboratory courses: Electrical Engineering 102; Civil Engineering 108F; Metallurgy 152L.

Courses in business fields: Economics 10, 1A-1B; Engineering 120, Mechanical Engineering 143; Business Administration 10, 18, 100, 142, 150, 160, 190; Mathematics 121; Psychology 3.

COLLEGE OF DENTISTRY

The College of Dentistry offers two curricula, leading to the degree of Bachelor of Science and to the degree of Doctor of Dental Surgery. The student has the option, at the close of the second semester in the dental college, of registering in either one of two major curricula: (1) restorative dentistry, or (2) preventive dentistry. At the end of the sophomore year (fourth semester), a selected small group of students may enter the Honors Curriculum, which is designed to train outstanding students in the fields of dental research and teaching. In addition to these, there is a curriculum for the training of dental hygienists, leading to the degree of Bachelor of Science.

Classes are admitted to the College of Dentistry once a year, in September. Applications must be filed not later than April 15. Upon the satisfactory completion of six semesters the dental student will be eligible for the Bachelor of Science degree, and for the Doctor of Dental Surgery degree upon the comple-

** Honor students may take Chemistry 144 in the junior year and will not be required to take Mechanical Engineering 105A provided they elect Chemistry 114H or Mechanical Engineering 161 in the senior year.

* Not required of students who complete a 10-unit minor in food technology.

† Chemistry 105 may be substituted for 104.

tion of two additional semesters. The Bachelor of Science degree will be granted the student in the dental hygiene curriculum at the end of the fourth semester.

Admission to Dental Curricula

All applicants for admission to the dental curricula must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee (approximately a B average), including the requirements (2)-(5) listed below. The student will find himself more adequately prepared for the dental curricula if he has taken in high school the following subjects: English, 3 units; history, 1 unit; mathematics, 3 units (algebra, plane geometry, and trigonometry); chemistry, 1 unit; physics, 1 unit; foreign language, 2-4 units.

Requirements for First and Second Years

- (1) *General University requirements**
 Subject A (see page 38).
 Military science and tactics (men) 8 units
- (2) English or speech (1A-1B†) 6
- (3) Science 28-32
- (a) Chemistry
 Inorganic (1A-1B) 10 units
 Organic lecture (8) 3
 Organic laboratory (9) or quantitative analysis (5) 3
- (b) Physics with laboratory (2A-2B and 3A-3B or 4A-4B-4C) 6-8
- (c) Biology, including one full semester of vertebrate zoölogy, with laboratory (Zoölogy 1A-1B) 6-8
- (4) Trigonometry (Mathematics C) 3 units
 It is suggested that this requirement be completed in high school.
- (5) Electives selected as indicated from the following groups: . . 15-20
- (a) Group I: 2 year courses selected from Anthropology (2A-2B), Economics (1A-1B), Economic Geography, Geography, History (4A-4B, 8A-8B, 17A-17B), Mathematics, Political Science (1, 2), Psychology (1A-33), Public Health (5A-5B), Sociology and Social Institutions (10A-10B) 12-14 units
- (b) Group II: *Either* (a) one year course or year sequence in foreign literature in translation (French 39A-39B, German 39A-39B-39C), a year sequence of any foreign language, English (44A-44B, 46A-46B), Music (30A-30B), Philosophy (6A-6B, 20A-20B); *or* (b) any combination of two semester

* The requirement of American History and Institutions is also prerequisite to the bachelor's degree, page 39.

† Course numbers in parentheses refer to courses given in the departments at Berkeley.

courses selected from Architecture (5A, 5B, 5C, 14), Art (1B, 1C, 19), English (30), Music (27A, 27B, 27C, 27D, 27E), or any two semesters of a foreign language in which at least 6 units have previously been completed or are completed concurrently.

The applicant who wishes to qualify for the degree of Bachelor of Science in addition to the degree of Doctor of Dental Surgery must complete satisfactorily a special project and thesis in the field of his major interest under the supervision of a faculty committee, and receive passing grades in 4 units of special instruction selected by the committee.

The College of Dentistry reserves the right to limit enrollment on the basis of scholarship, a performance test, and interviews.

Because of the large number of applications, it has become necessary to limit the applicants to those who have had the major part of their high school and preprofessional education and residence in the State of California. A small number of students will be admitted from the far western states which lack dental schools.

Admission to the Dental Hygiene Curriculum

Applicants for admission to the dental hygiene curriculum must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee (approximately halfway between a C and B average), including the requirements (2)–(5) listed below. Students planning to enter this curriculum should make this fact known at the time of their first registration. The student will find herself more adequately prepared if she has taken in high school the following subjects: English, 3 units; history, 1 unit; mathematics, 3 units (algebra, plane geometry, and trigonometry); chemistry, 1 unit; physics, 1 unit; foreign language, 3 or, preferably, 4 units).

(1) *General University Requirements:*

Subject A (examination in English composition).

American History and Institutions (required for the bachelor's degree. The examination in American History and Institutions may be taken in the College of Dentistry, but it is preferable to satisfy the requirement in the pre dental program. See page 39).

- | | |
|---|---------|
| (2) English or speech (1A–1B*) | 6 units |
| (3) Chemistry (1A, 8) | 8 |
| (4) Biology (Zoölogy 1A–1B) | 6–8 |
| (5) <i>Either</i> the Associate in Arts degree from the University of California (or its equivalent), <i>or</i> the following program of courses: | |

- (a) A year course selected from each of the three groups: I, II and III.

* Course numbers in parentheses refer to courses given in the departments at Berkeley.

Group I: Anthropology (2A-2B), Economics (1A-1B), History (4A-4B, 8A-8B, 17A-17B), Political Science (1, 2), Sociology and Social Institutions (10A-10B),

Group II: Psychology (1A-33), Public Health (5A-5B), Home Economics (1A-1B).

Group III: Philosophy, Art, Music, Literature, Foreign Language.....18-20 units

(b) Six additional units selected from any one of the three groups listed under (a)..... 6

(c) Electives12-16

COLLEGE OF ENGINEERING

Matriculation requirements.—A statement concerning matriculation requirements will be found on page 25. High school subjects prerequisite to college courses required in all engineering curricula include: plane geometry, 1 unit; algebra, 2 units; trigonometry, $\frac{1}{2}$ unit; mechanical drawing, 1 unit; chemistry, 1 unit, or physics, 1 unit (both are desirable). Without this preparation it will be necessary for the student to take equivalent courses in college, thereby barring him from regular courses and delaying his graduation.

Advanced standing.—For general information, see page 30.

Admission to the College of Engineering.—Satisfaction of the matriculation requirements admits the student to the University but not necessarily to the College of Engineering. Admission to the College of Engineering will be based on the results of an entrance examination and a consideration of the student's grades.

All persons applying for admission to the lower division must take the Freshman Status Examination. Admission to the lower division will be based upon results achieved in the test and the grade-point average achieved in University matriculation requirements.

Admission to all upper division courses and continuation in the College of Engineering is based on satisfactory completion of the Junior Status Examination (which is given to all students just prior to the completion or at the end of the sophomore year) and a consideration of the student's grades in the freshman and sophomore required subjects.

The same examinations are required for admission to the College of Engineering at Berkeley or at Los Angeles. Places and times for the examinations may be obtained from the Dean of the College of Engineering at either campus. Application blanks for these examinations should be obtained by the prospective student several months before he plans to transfer to the University. A \$5 fee will be charged for each examination if taken with a group of three or more persons, otherwise the fee is \$10.

Intercampus transfer.—Students who wish to transfer from other colleges on the campus to the College of Engineering must make application to the Dean

of the College of Engineering for such transfer no later than August 15 for the fall semester and January 16 for the spring semester. Petitions to change college may be secured from the office of the Dean, 218 Engineering Building. Students who wish to transfer to the College of Engineering are required to take the appropriate competitive examination noted above.

Enrollment in engineering courses.—Enrollment in engineering courses is limited to students who are registered in the College of Engineering. Students registered in other colleges or schools on the campus and undertaking curricula in which engineering courses are prescribed will be admitted to these courses upon written approval of the adviser.

Curricula in engineering.—Students in the College of Engineering may elect any one of many curricula. All of the curricula are grouped under the 11 main curricula in agricultural engineering, civil engineering, electrical engineering, engineering physics, industrial engineering, mechanical engineering, metallurgy, mineral exploration, mining engineering, petroleum engineering, and process engineering. Each is a four-year curriculum leading to the Bachelor of Science degree upon completion of the specified number of units, and, in addition, grade points equal to the number of units in the credit value of all courses undertaken.

For the guidance of students, details of the several curricula are presented on the following pages. *The curricula printed in this bulletin apply only to students who began their college studies in July, 1946, or later. Students who have entered prior to this time should in general conform to the curricula in force at the time of entrance.* Details of the curricula may be obtained at the office of the College of Engineering.

Each curriculum consists of a group of subjects, the study of which gives adequate preparation for the beginning of professional engineering work in the designated field. The subjects and units involved in the several curricula are as follows:

(1) Subjects common to all curricula in engineering:	Units
Chemistry	8
Physics	12
Mathematics (including differential and integral calculus) ..	12
Analytic mechanics and strength of materials	6
Applied thermodynamics and fluid mechanics	6
Applied electricity and magnetism	3
Properties of materials	3
Drawing and graphics	4
Engineering design	3
Engineering economics	3
Electives	12

(2) Subjects characteristic of the several curricula. In addition to the subjects and units common to all curricula in engineering, the several curricula include at least the number of units in each of the subjects shown in the following table. Each curriculum requires the total number of units shown at

the top of the column, the totals in all cases including the 8 units of military science required of all male undergraduates. Students not required to study military science may substitute other subjects aggregating the same number of units. Credit in physical education may be used for this purpose up to a maximum of four units. The optional subjects noted are to be chosen from sequences of scientific and professional courses giving emphasis to a particular phase of a general field.

Units	Units
<i>Agricultural Engineering:</i> 134	<i>Metallurgy:</i> 134
Mechanics, Thermodynamics, Fluid Mechanics 6	Chemistry 5
Irrigation, Soil Science, Agronomy 13	Metallurgy 18
Agricultural Machinery and Structures 17	Optional Subjects 31
Optional Subjects 18	<i>Mineral Exploration:</i> 136
<i>Civil Engineering:</i> 132	Chemistry 2
Mechanics, Strength of Materials, Properties of Materials, Specifications 9	Dynamics 3
Hydraulic, Sewerage, Foundation, Structural, and Transportation Engineering 14	Mineralogy, Geology, and Paleontology 34
Optional Subjects 29	Surveying and Map Drawing. 6
<i>Electrical Engineering:</i> 132	Optional Subjects 11
Mathematics 4	<i>Mining Engineering:</i> 134
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials 6	Chemistry 2
Electrical Circuits and Machinery. 22	Dynamics 3
Optional Subjects 20	Mineralogy and Geology. 18
<i>Engineering Physics:</i> 128	Mining 10
Chemistry 8	Metallurgy 5
Physics 8	Analysis of Ores. 6
Mathematics 4	Optional Subjects 10
Optional Subjects 20	<i>Petroleum Engineering:</i> 134
Foreign Language 8	Chemistry 8
<i>Industrial Engineering:</i> 134	Mechanics, Thermodynamics, Fluid Mechanics 6
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials 10	Petroleum Technology and Economics 16
Electrical Circuits and Machinery. 5	Optional Subjects 24
Business Administration 15	<i>Process Engineering:</i> 134
Optional Subjects 24	Chemistry 16
<i>Mechanical Engineering:</i> 131	Mathematics 4
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials 11	Heat Transfer and Unit Operations 9
Mechanical Design and Manufacturing Processes 10	Unit Processes 8
Electrical Circuits and Machinery. 5	Applied Thermodynamics and Fluid Mechanics 8
Optional Subjects 25	Optional Subjects 19

Requirements for the Degree of Bachelor of Science.—The degree of Bachelor of Science in the College of Engineering is awarded to those candidates who:

(1) Satisfy the general University requirements:

(a) Military science and tactics. See page 40. Eight units of credit toward the degree will be allowed those students who are required to take military science. Those who are exempt from this requirement must make up the 8 units by taking elective courses.

(b) Subject A. See page 38.

(c) American History and Institutions. See page 39.

(d) Residence during the senior year. See page 43.

Note: Students in the College of Engineering are required to take the final 32 units of work in residence rather than the minimum required by the University.

(e) Grade points. See page 45.

(2) Satisfactorily complete one of the engineering curricula. A student who gives full time to University responsibilities may enroll without special permission for the number of units required in his program of study (see pages 109–117). A student who engages in part-time employment should plan to spend more than four years by enrolling each semester for fewer than the required number of units. In such cases, course sequences must be carefully planned if delay is to be avoided.

Advisers will aid candidates for military or naval commissions in rearranging their programs of study to include upper division courses in military or naval R.O.T.C.

(3) Satisfy the requirement in English. Each candidate for a degree must exhibit a reasonable degree of accuracy and facility in the use of English. Any student whose use of English is unsatisfactory may be reported to the Dean of the College of Engineering. The Dean may then assign supplementary course work which may cause a delay in graduation.

Programs of study.—For the guidance of students, courses satisfying the subject requirements of each curriculum have been selected and are listed on the following pages. These have been arranged in sequences such that course prerequisites are satisfied. Other sequences are possible in some cases but should be carefully checked with the study-lists adviser in order to avoid delay caused by the lack of prerequisites.

Upon admission to the college, engineering students are assigned to faculty advisers, and are under the guidance of the Dean of the College of Engineering and the Committee on Study Lists. Study programs are arranged in conference with the adviser and must be approved by him.

Students who plan to seek advanced degrees are referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

Selection of electives.—There are 12 units of electives in each curriculum to provide for the study of nonengineering subjects which have been placed in the following groups:

1. English, speech.
2. Foreign languages.
3. Business administration, economics, political science.
4. Anthropology, history, sociology and social institutions, psychology.
5. Life sciences.
6. Fine arts and philosophy.

The elective units must be chosen from at least two of the above groups. If the curriculum contains more than 12 elective units, the remainder may be chosen from any department of the University.

Students in agricultural, industrial, mechanical, mining, metallurgical, and petroleum engineering and mineral exploration must select 3 units from group 1, and a total of 9 additional units from two or more of the remaining groups.

Engineering students who are also to be candidates for military or naval commissions may present 6 units of upper division military or naval science courses in place of the same number of elective units.

PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 8.
4. Engineering 1A, 22, 23, 24, 35, 40, 41.
5. Civil Engineering 108A, 108F.
6. Electrical Engineering 100A, 100B, 104A, 104B.
7. Mechanical Engineering 105A, 105B, 103 (or Civil Engineering 110), 151 (or Physics 116), 152A (or Chemistry 109).
8. Engineering Design 102B, 106 (or Civil Engineering 107A).
9. Agricultural Engineering 12, 49*, 113, 114, 115, 130.
10. Agricultural Economics 118.
11. Irrigation 120.
12. Soil Science 106.
13. Agronomy 110.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 8, Engineering 1A, 22, 23, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40, 41, Agricultural Engineering 12,* free electives, 3 units.

Third Year.—Mechanical Engineering 105A, 105B, Engineering Design 102B, 106 (or Civil Engineering 107A), Civil Engineering 108A, 108F, Electrical Engineering 100A, 100B, 104A, 104B, Mechanical Engineering 103 (or Civil Engineering 110), Agricultural Economics 118, free electives, 3 units.

Fourth Year.—The program of the fourth year will be taken on the Davis campus and will consist of Agricultural Engineering 113, 114, 115, 130,

* Not required of students entering with junior standing.

Mechanical Engineering 151 (or Physics 116), Mechanical Engineering 152A (or Chemistry 109), Irrigation 120, Soil Science 106, Agronomy 110, free electives, 3 units.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN CIVIL ENGINEERING

Specific Course Requirements for the B.S. Degree (all options) :

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B.
4. Engineering 1A, 1B, 8, 22, 23, 35.
5. Geology 1.
6. Engineering Design 102B.
7. Civil Engineering 106, 107A, 108A, 108C, 108E, 109A, 110, 111A, 113, 116, 133, 135, 161.
8. Mechanical Engineering 105A.
9. Electrical Engineering 101.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 1B, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Engineering 22, 23, 8, 35, Physics 4B, 4C, Geology 1, free electives, 2 units.

Third Year.—Engineering Design 102B, Civil Engineering 107A, 108A, 108C, 108E, 110, 135, 161. (Students in sanitary and municipal options take Civil Engineering 161 in senior year and Civil Engineering 111A in junior year.)

Fourth Year.—Civil Engineering 106, 109A, 113, Electrical Engineering 101, Civil Engineering 111A, 116.

Students are required to select one of the options listed below. Courses indicated are required for completion of the option.

Construction:

Third Year: Business Administration 1A, 1B, 150, 151, Civil Engineering 133.

Fourth Year: Engineering 120, Business Administration 122, 190, Mechanical Engineering 105A, free electives, 8 units.

Irrigation:

Third Year: Civil Engineering 102A, 133, Irrigation 102A, 103, Mechanical Engineering 105A, free electives, 2 units.

Fourth Year: Irrigation 101, 102B, 104, 112, Civil Engineering 137, free electives, 9 units.

Sanitary and Municipal:

Third Year: Civil Engineering 125, 123, Bacteriology 2, Zoölogy 109, free electives, 3 units.

Fourth Year: Civil Engineering 111B, 109B, 133, Mechanical Engineering 105A, free electives, 11 units.

Students interested in public health should elect at least 5 units from the following: Public Health 113B, 145, 162, 170, 171; Chemistry 8, 109; Civil Engineering 126; Physiology 107; Political Science 181. Students interested in municipal engineering should elect at least 5 units from the following: Political Science 162, 181; Civil Engineering 102A, 171, Architecture 120A, 120B, or 121A, 121B; Irrigation 112.

Structural:

Third Year: Civil Engineering 120, 133, Mechanical Engineering 105A, free electives, 6 units.

Fourth Year: Mechanical Engineering 120, Civil Engineering 136, 137, 108H, 108G, 107G, free electives, 6 units.

Transportation:

Third Year: Civil Engineering 102A, 102B, 133, free electives, 6 units.

Fourth Year: Economics 170A, Civil Engineering 108H, 108G, 104, 136, 171, Mechanical Engineering 105A, free electives, 3 units.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN ELECTRICAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3, 4A, 4B, 110.
2. Chemistry 1A, 8.
3. Physics 4A, 4B, 4C.
4. Engineering 22, 23, 35, 42, 113, 120 (or Business Administration 100).
5. Electrical Engineering 104A, 104B, 105, 106, 110A, 110B, 111A, 116A, 132A, 133.
6. Mechanical Engineering 105A, 105B, 107.
7. Engineering Design 102B.
8. Civil Engineering 108A, 108F.
9. English (Speech 1A, English 1A or 41A or other approved English course).

First Year.—Mathematics 3, 4A, Physics 4A, Chemistry 1A, 8, Engineering 22, 23, free electives, 3 units.

Second Year.—Mathematics 4B, 110, Physics 4B, 4C, Engineering 35, 42, free electives, 6 units.

Third Year.—Electrical Engineering 110A, 110B, 104A, 104B, 105, 106, Mechanical Engineering 105A, 105B, 107, Engineering Design 102B, Civil Engineering 108A, 108F, English.

Fourth Year.—Electrical Engineering 111A, 116A, 132A, 133, Engineering 113, 120 or Business Administration 100, free electives, 3 units, and 16 units of restricted electives. All elective courses must fit into a comprehensive plan that meets the approval of the Committee on Study Lists of the College of Engineering. These units must be of senior level and are to be taken at the University of California. Suggested options are:

Business Administration: 6 units of senior electrical engineering restricted electives (subject to the approval of adviser), Business Administration 100, 142, 150, 190.

Communications: Electrical Engineering 116B, 117A, 117B, 123A, 123B, 132B.

Illumination: Electrical Engineering 140, 141, Physics 108A (or 108B), Physiological Optics 105B, Architecture 108A, 110.

Industrial Electronics and Control: Electrical Engineering 126, 127, 135, and any two of the following: Electrical Engineering 111B, Mathematics 119A, 119B, Mechanical Engineering 143, 164.

Physics: Electrical Engineering 103, 117A, 117B (or Physics 110A, 110B), Physics 115, 121, 124.

Power: Electrical Engineering 111B, 118A, 118B, 122A, 122B, and any two of the following: Electrical Engineering 126, 127, 135, Civil Engineering 161, Mechanical Engineering 103, 118, 170.

Free Electives: In addition to completing the requirements noted above, 12 units of free electives must be included in the program. See page 109 for selection of electives.

PROGRAM OF STUDY IN ENGINEERING PHYSICS

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 14A, 14B.
2. Chemistry 1A, 1B, 8, 109 (or 5).
3. Physics 4A, 4B, 4C, 105A, 105B, 121, 110A, 110B, 112, 108B.
4. Engineering 22, 23, 120.
5. Mechanical Engineering 103, 164.
6. Civil Engineering 108A.
7. German or French. The first two years of high school work in a foreign language will be counted in satisfaction of 4 units of this requirement, and each year thereafter as 4 units. The satisfaction of requirements in high school does not, however, reduce the amount of work required in the University for the B.S. degree (128 units). If this requirement is satisfied through work taken in high school, the 8 units thus released become free electives.

First Year.—Mathematics 3A, 3B, Chemistry 1A, 1B, Physics 4A, Engineering 22, 23, free electives, 3 units.

Second Year.—Mathematics 14A, 14B, Chemistry 8, 109 (or 5), Physics 4B, 4C, free electives, 6 units.

Third Year.—Physics 105A, 105B, 121, 110A, 110B, 112, Mechanical Engineering 103, German or French, free electives, 3 units.

Fourth Year.—Physics 108B, Mechanical Engineering 164, Engineering 120, Civil Engineering 108A, restricted electives, 20 units. Restricted electives are to be chosen with the approval of the study-list adviser from subjects in the fields of engineering, science, and mathematics. At least 10 of these units shall be in engineering subjects. Restricted electives should be selected from courses in a consistent field of study and must be of senior level.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN INDUSTRIAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Chemistry 1A, 8.
3. Physics 4A, 4B, 4C.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48, 113, 120.
5. Economics 2.
6. Business Administration 1A, 1B, 100, 142, 190.
7. Civil Engineering 108A, 108F.
8. Electrical Engineering 100A, 100B, 104A, 104B.
9. Engineering Design 102B, 106.
10. Mechanical Engineering 103, 105A, 105B, 107, 143, 144, 145.

First Year.—Chemistry 1A, 8, Mathematics 3A, 3B, Physics 4A, Engineering 1A, 22, 23, 48, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40, 41, Economics 2.

Third Year.—Civil Engineering 108A, 108F, Electrical Engineering 100A, 100B, 104A, 104B, Engineering Design 102B, 106, Mechanical Engineering 103, 105A, 105B, Business Administration 1A, 1B.

Fourth Year.—Mechanical Engineering 107, 143, 144, 145, Engineering 113, 120, Business Administration 100, 142, 190, free electives, 9 units.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN MECHANICAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B. (A number of senior engineering courses either require or strongly recommend Mathematics 110A–110B as prerequisites. In addition, all graduate courses require Mathematics 110A–110B. Students who plan to enter certain options, or expect to take graduate work, should take Mathematics 110A–110B during the junior year.)
2. Chemistry 1A, 8.
3. Physics 4A, 4B, 4C.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48, 113, 120.
5. Electrical Engineering 100A, 100B, 104A, 104B.
6. Civil Engineering 108A, 108F.
7. Engineering Design 102B, 106.
8. Mechanical Engineering 103, 105A, 105B, 124A, 124B, 131A, 131B.

First Year.—Mathematics 3A, 3B, Chemistry 1A, 8, Engineering 1A, 22, 23, 48, Physics 4A, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40, 41, free electives, 3 units.

Third Year.—Engineering Design 102B, 106, Mechanical Engineering 103, 105A, 105B, Electrical Engineering 100A, 100B, 104A, 104B, Civil Engineering 108A, 108F, free electives, 6 units.

Fourth Year.—Engineering 113, 120, Mechanical Engineering 124A, 124B, 131A, 131B, and 12 units of restricted electives. Senior students will select a sequence of restricted electives in any of one of the options indicated or any other logical sequence of courses approved by the senior study-list officers. Of the 12 units of restricted electives to be taken at the University of California, 5 units must be senior mechanical engineering courses taken at Berkeley.

Aeronautics Option: Mechanical Engineering 121, 162, Mathematics 110A, 110B, Civil Engineering 107G, Engineering Design 170, Mechanical Engineering 123A, 161, 164, 123B.

Air Conditioning and Refrigeration Option: Mechanical Engineering 115, 116 or 117, 161, 151, Metallurgy 170A, Mechanical Engineering 154, Chemistry 109, 110.

Automotive Option: Mechanical Engineering 123A, 123B, Metallurgy 170A, Mechanical Engineering 151, Engineering Design 170, Mechanical Engineering 173, 161, 154, Chemistry 109.

Fluid Mechanics (Hydraulics) Option: Mechanical Engineering 161, Mathematics 110A, 110B, Mechanical Engineering 162, 151, Engineering Design 170, Mechanical Engineering 164, Irrigation 102A, 102B, Petroleum Engineering 198.

Heat Power Option: Mechanical Engineering 123A, 123B, 118, 161, 117, 151, Petroleum Engineering 117, 119, Metallurgy 170A, Mechanical Engineering 154, Chemistry 109.

Heat Transfer and Thermodynamics Option: Mechanical Engineering 151, 154, 152A, 161, Mathematics 110A, 110B, Physics 112, Chemistry 109.

Industrial Option: Mechanical Engineering 143, 144, 145, Business Administration 100, 142, 150, 190.

Marine Engineering and Naval Architecture: Mechanical Engineering 128A, 128B, 126, 123A, 123B, 161, 117, Engineering Design 170.

Mechanical Design Option: Engineering Design 170, 171, 172, Mechanical Engineering 145, 173, Mathematics 110A, 110B, Mechanical Engineering 164, Electrical Engineering 126.

Process Engineering Option: Mechanical Engineering 152A, 152B, 154, 161, 163, 151, 164, Chemistry 109, 144.

Preparation for Graduate Study Option: Mathematics 110A, 110B, Mechanical Engineering 151, 161, 162, Engineering Design 170, Mechanical Engineering 154, Mathematics 119A, 119B, Physics 104A, 104B.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN METALLURGY

Specific Course Requirements for the B.S. Degree, Option in Physical Metallurgy:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A, 110B.
4. Engineering 22, 23, 35 (or Physics 105A), 41, 120 (or Business Administration 100).
5. Metallurgy 2A, 102, 106, 150A, 150B, 170A, 170B, 172.
6. Civil Engineering 108A, 108F.
7. Engineering Design 102B (or Physics 105B), 106 (or Physics 121).
8. Mechanical Engineering 103.
9. Electrical Engineering 101, 102.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 22, 23, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Metallurgy 2A, Chemistry 110A, Engineering 35 (or Physics 105A), free electives, 6 units.

Third Year.—Chemistry 110B, Civil Engineering 108A, 108F, Engineering Design 102B (or Physics 105B), Mechanical Engineering 103, Metallurgy 150A, 150B, Metallurgy 102, 106, Engineering 41, restricted electives, 4 units, free electives, 3 units.

Fourth Year.—Engineering 120 (or Business Administration 100), Engineering Design 106 (or Physics 121), Metallurgy 170A, 170B, 172, Electrical Engineering 101, 102, restricted electives, 15 units, free electives, 3 units. Restricted electives are to be selected from subjects pertaining to science, engineering, or other fields which contribute to the student's professional skill. They must be chosen to form a consistent program acceptable to the adviser. At least one of the following courses must be included in the physical metallurgy program: Metallurgy 154, 160, 174, 176.

Free Electives: For selection of free electives, see page 109.

*Specific Course Requirements for the B.S. Degree, Option in Process
Metallurgy:*

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A, 110B.
4. Engineering 1A, 22, 23, 35, 120.
5. Metallurgy 2A, 2B, 106, 108, 110A, 110B, 112, 114, 150A.
6. Geology 1, 103, 109, 106.
7. Electrical Engineering 101, 102.
8. Mining 103, 105A, 113.
9. Mineralogy 4A, 4B.
10. Civil Engineering 108A, 110.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 22, 23.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Metallurgy 2A, 2B, Chemistry 110A, Geology 1, Mineralogy 4A, 4B.

Third Year.—Engineering 35, Chemistry 110B, Electrical Engineering 101, 102, Geology 103, 106, 109, Mining 113, Metallurgy 106, 108, 110A, 150A, free electives, 6 units.

Fourth Year.—Engineering 120, Civil Engineering 108A, 110, Mining 103, 105A, Metallurgy 110B, 112, 114, restricted electives, 2 units, free electives, 6 units. Restricted electives are to be selected from subjects pertaining to science, engineering, or other fields which contribute to the student's professional skill.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN MINERAL EXPLORATION

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 109.
4. Engineering 1A, 1B, 22, 23, 35.
5. Geology 1, 3, 102A, 102B, 103, 108, 106, 116, 118.
6. Mineralogy 4A, 4B, 103.
7. Metallurgy 2A.
8. Mining 101, 107A, 107B, 111A, 111B, 113.
9. Electrical Engineering 101.
10. Engineering Design 102B.
11. Civil Engineering 108A.
12. Mechanical Engineering 103.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 22, 23, Geology 1.

Second Year.—Geology 3, Mathematics 4A, 4B, Mineralogy 4A, 4B, Engineering 1A, 1B, Physics 4B, 4C, free electives, 3 units.

Third Year.—Metallurgy 2A, Geology 102A, 102B, 103, 106, 108, Engineering 35, Mineralogy 103, Mining 113, Electrical Engineering 101, Mining 101, Geology 118 (summer course), free electives, 3 units.

Fourth Year.—Engineering Design 102B, Geology 116, Mechanical Engineering 103, Chemistry 109, Civil Engineering 108A, Mining 111A, 111B, 107A, 107B, free electives, 7 units.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN MINING ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B.
4. Engineering 1A, 1B, 22, 23, 35.
5. Geology 1, 102A, 102B, 103, 106.
6. Mineralogy 4A, 4B.
7. Mining 1, 103, 105A, 105B, 107A, 109, 113.
8. Civil Engineering 108A.
9. Electrical Engineering 101.
10. Mechanical Engineering 103, 105A.
11. Metallurgy 2A, 2B, 106 or 124, 108, 110A.
12. Engineering Design 102B.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 1B, 22.

Second Year.—Geology 1, Mathematics 4A, 4B, Mineralogy 4A, 4B, Metallurgy 2A, 2B, Engineering 35, Mining 113, Physics 4B, 4C.

Third Year.—Engineering 23, Civil Engineering 108A, Electrical Engineering 101, Geology 102A, 102B, 103, 106, Engineering Design 102B, Mechanical Engineering 105A, Mining 1, 101, free electives, 3 units.

Fourth Year.—Mechanical Engineering 103, Metallurgy 108, 110A, Mining 103, 105A, 105B, 107A, 109, free electives, 10 units.

Free Electives: For selection of free electives, see page 109.

PROGRAM OF STUDY IN PETROLEUM ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 5, 8.
4. Engineering 1A, 1B, 22, 23, 35.
5. Engineering Design 102B.
6. Mechanical Engineering 103, 105A, 105B.
7. Civil Engineering 108A.
8. Electrical Engineering 101.
9. Petroleum Engineering 117, 119, 121A, 121B, 123A, 123B, 125, 127.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 1B, 22.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 23, 35, Chemistry 5, 8, electives, 6 units.

Third Year.—Engineering Design 102B, Mechanical Engineering 103, 105A, Civil Engineering 108A, Electrical Engineering 101, Petroleum Engineering 117, 119, electives, 16 units.

Fourth Year.—Mechanical Engineering 105B, Petroleum Engineering 121A, 121B, 123A, 123B, 125, 127, electives, 14 units.

Electives.—Twelve units of these electives are to be selected from nonengineering courses, see page 109. The remaining 24 units are restricted electives which are to be chosen from a group of technical courses appropriate for one of the following options:

1. Development option (emphasizing the geological sciences).
2. Production option (emphasizing mechanical engineering).

PROGRAM OF STUDY IN PROCESS ENGINEERING

Specific Course Requirements for the B.S. Degree :

1. Mathematics 3A, 3B, 4A, 4B, 110A, 110B.
2. Chemistry 1A, 1B, 5, 12A, 109, 147.
3. Engineering 22, 23, 35, 42, 48, 120.
4. Physics 4A, 4B, 4C.
5. Civil Engineering 108A.
6. Mechanical Engineering 105A, 105B, 103, 107, 131A, 131B, 151, 152A, 152B, 154.
7. Electrical Engineering 101.
8. Metallurgy 150A.
9. Engineering Design.*

First Year.—Mathematics 3A, 3B, Chemistry 1A, 1B, Engineering 22, 23, 48, Physics 4A, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Chemistry 5, 12A, Engineering 35, 42, free electives, 3 units.

Third Year.—Civil Engineering 108A, Chemistry 109, Mechanical Engineering 105A, 105B, 107, 103, Electrical Engineering 101, Metallurgy 150A, Mathematics 110A, 110B, free electives, 6 units.

Fourth Year.—Mechanical Engineering 154, 151, 152A, 152B, 131A, 131B, Engineering 120, Chemistry 147, Engineering Design,* restricted electives, 3 units.

Free Electives : For selection of free electives, see page 109.

Ceramic Engineering

Instruction in ceramic engineering will be offered in the Colleges of Engineering, the program at Berkeley emphasizing the exploitation and technology of California raw materials and study of ceramic composition, while that at Los Angeles will be directed toward the problems encountered in ceramic manufacturing. The courses at Berkeley will be given under the Division of Mineral Technology. A preliminary survey of the present industry in the State indicates need for a limited number of outstanding undergraduate students together with a considerable demand for graduate instruction and research.

Transportation and Traffic Engineering

Through the newly established Institute of Transportation and Traffic Engineering various offerings are available in the fields of highway, railroad, and airport engineering. The undergraduate work is formally offered in civil engineering under the transportation option, which has been revised to include such courses as traffic engineering and transportation economics. On the graduate level, the Institute offers advanced courses in highway planning, design, and economics, traffic engineering, airport planning and design, highway materials and structures, airphoto interpretation applied to transportation problems. Available in other departments of the University are courses pertinent to advanced study in the field, such as transportation economics, public administration, and city and regional planning.

* May be satisfied in 1949-1950 by a special section of Mechanical Engineering 198.

THE COÖPERATIVE STUDY PROGRAM IN ENGINEERING

Under the coöperative study program an opportunity is provided for a limited number of students to obtain work experience in industry while completing their undergraduate work. This program requires five years for completion of work for the B.S. degree.

Under the coöperative program the students complete their first year in the normal manner. During the following three years, students alternately work in industry six months and attend the University six months. In this three-year period the students complete the normal second- and third-year courses and obtain one and one-half years of work experience. Following the three-year coöperative period, the students complete the fourth year of study without interruption.

The coöperative program is limited to students following the industrial, mechanical and electrical engineering curricula. The number who may follow this program is limited. Students are selected upon the basis of their grades achieved in the first year and an interview.

During the work periods the students are not registered in the University. They are regular employees of the companies for which they are working. All jobs are regular ones, and the students receive the normal compensation for the work being done. Each student normally works all of the three periods at one company to which he has been assigned. Students may expect to start their first work period at simple, lower-paid jobs. Progression to more advanced work is made during later work periods.

Students who are interested in following the coöperative program should apply at the Office of the Dean, College of Engineering during the fall semester of the first year to arrange for interviews.

Honors

Honors with the Bachelor's Degree.—In the College of Engineering students may receive honors with the bachelor's degree for high scholarship in the curriculum, or for distinction in the advanced work in any curriculum of the College of Engineering.

Students who, in the judgment of proper authorities, display marked superiority may be recommended for the special distinction of highest honors.

COLLEGE OF PHARMACY

The College of Pharmacy offers a curriculum leading to the degree of Bachelor of Science in Pharmacy.

Information concerning the courses offered in the College of Pharmacy will be found in the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY which may be obtained by addressing the Dean of the College of Pharmacy, University of California, Medical Center, San Francisco 22, California.

The first year of the curriculum may be taken in the University at Berkeley, Davis, or Los Angeles, or in another institution of approved standing. The courses of the final three years are given in the College of Pharmacy in San Francisco (with one exception—Physics 3A-3B is taken in Berkeley). Students who plan to take the first year's work in an institution other than the University of California, should consult the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY in order to make certain that the requirements will be fulfilled.

Students who have completed the requirements of the first year cannot be assured of admission to the second year on the Medical Center campus. When the number of qualified applicants exceeds the available facilities, selection of students will be made on a basis of scholarship as determined from the transcript of record and by examination. A personal interview may be required. Application blanks for admission to the College of Pharmacy on the Medical Center campus may be obtained from the Admissions Office, 103 Pharmacy Building, University of California, Medical Center, San Francisco 22, California.*

Matriculation requirements.—Requirements for admission to the academic departments of the University will be found on pages 25–35. High school subjects prerequisite to courses required in the College of Pharmacy curriculum include mathematics (including trigonometry and two years of algebra), 2½ units; chemistry, 1 unit. Without this preparation, it will be necessary for the student to take equivalent courses in the University which may prolong the time necessary to complete requirements for graduation.

Graduation.—The degree of Bachelor of Science in Pharmacy is granted upon completion of four years of residence and 129 units of credit. In order to receive the degree, the student must have obtained at least as many grade points as the total number of units undertaken. (For other requirements, the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY should be consulted.)

CURRICULUM

Program of First Year

(At Berkeley, Davis, or Los Angeles)

	Fall Units	Spring Units
Zoölogy 1A–1B	4	4
Botany 12 (or equivalent) ¹ .....	..	4
Chemistry 1A–1B	5	5
English 1A–1B or Speech 1A–1B	3	3
Mathematics ²	3	..
Military Science	2	2
Subject A (English Composition) .....	..	..
	17	18

Mr. John J. Eiler and Mr. Donald C. Brodie, pharmacy advisers to the first-year students in the College of Pharmacy at Berkeley, will hold regular office hours in 1557 Life Sciences Building, Berkeley, during the registration period, and also at regularly announced periods during each semester.

* Students making application for admission to the College of Pharmacy, San Francisco campus, must have the application on file in the Admissions Office by May 1, 1949. The application should be addressed to the Admissions Office, Room 103, Pharmacy Building, University of California, Medical Center, San Francisco 22, California.

¹ Botany 1 or the first semester of the freshman course in college botany may be substituted for Botany 12.

² Students should have completed two years of algebra and one-half year of trigonometry in high school. If these requirements have not been satisfied equivalent courses (Mathematics C, Mathematics D) must be taken. Students who have satisfied the high school requirements should take one of the following courses: Mathematics 3A or 3B, 11A or 11B.

SCHOOL OF ARCHITECTURE

Students in good standing having a minimum of 60 units of University credit will be admitted to the School upon formal application filed with the Secretary of the School. In order to complete the prescribed curriculum in the indicated time, such students should also have completed the prerequisites to the work of the junior year.

Freshmen who plan to enter the School later should, upon entering the University, register in the College of Letters and Science (Prearchitecture) where they will normally remain for two years. Successful completion of the curriculum given below will lead to the degree of Associate in Arts in the College of Letters and Science and satisfy the prerequisites for the courses in the curriculum of the School.

New students requesting advanced standing in architectural design or graphic art courses offered by the School must present a representative exhibit of their work for evaluation by the faculty during registration week.

Advisers: Freshman and sophomore years—Mr. S. L. JORY, Mr. H. A. STUMP, Mr. C. A. STEINER; junior, senior, and graduate years—Mr. W. C. PERRY, Mr. R. W. JEANS, Mr. MICHAEL GOODMAN.

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Subject A (see page 38) . . . . .		..	Military Science	2	2
American History and Institutions (see page 39) . . . . .		..	Mathematics 4A	3	..
Military Science	2	2	Engineering 18A		3
² Mathematics 3A-3B	3	3	² Architecture 5A-5B, 6A-6B	3	3
² Physics 2A-2B	3	3	Architecture 3-4	3	4
Physics 3A-3B	1	1	Architecture 12	1	..
³ Year Course	3	3	¹ Foreign Language	4	4
Architecture 1-2	3	3			
Architecture 18		1			
Art 2A		2			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	16		16	16

The degree of Bachelor of Arts will be recommended for students of the School who have complied with the rules for candidacy for this degree and have successfully completed the prescribed undergraduate curriculum in architecture (or other training considered equivalent by the faculty of the School).

In the absence of the Associate in Arts degree, the following will be required for the A.B. degree: 16 units of foreign language; three year courses; 11 units of natural science (see requirements (b), (d), and (c) College of Letters and Science, page 67.

¹ See requirement (b), page 67, College of Letters and Science. (Students entering with only 4 units of high school credit in a foreign language will need to take an additional 4 units.)

² See requirement (c), page 67, College of Letters and Science.

³ See requirement (e), page 67, College of Letters and Science.

For description of courses named above, see under Courses of Instruction, in later pages of this bulletin.

Honors.—Honors with the A.B. degree may be recommended by the faculty for students graduating from the School. Honors in architecture are not recommended except for students who have done distinguished work in design and satisfactory work in construction.

Thesis for the degree of Graduate in Architecture.—This thesis must be prepared under the supervision of the Dean of the School and the staff. It consists of the serious study of a major building problem, with the emphasis not only upon design but upon construction as well. Preferably, it will be based upon actual conditions of site and use, the final study being carried to a point where no doubt exists of its reality. Preliminary studies providing a sound basis for the thesis should be completed during the first semester of the second graduate year so that the second semester may be devoted entirely to the development and presentation of the design itself.

SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration, which replaced the College of Commerce July 1, 1943, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science and Master of Business Administration.

Admission.—To be admitted to the School students must have attained at least junior standing and a C average in one of the colleges of the University of California, or the equivalent elsewhere. The bachelor's degree from an accredited institution is required for admission to the School of Business Administration in graduate standing.

Preparation.—An organized program of work fulfilling the requirements for admission to the upper division in any of the colleges of the University will provide sound preparation for work in the School. Most students meet the requirements of the College of Letters and Science, thus building a broad general foundation. Students who had completed more than one semester in the lower division of the College of Commerce prior to July 1, 1943, may substitute the Associate in Arts degree requirements of the College of Commerce for the Associate in Arts degree in Letters and Science, if they wish. Students may, however, if they prefer, elect to take their lower division work in the technical colleges. For instance, those looking forward to employment in the agricultural industries or in business based closely upon these industries, might well take their lower division work in the College of Agriculture. Likewise those wishing to work in the technical aspects of manufacturing or in industrial management could profitably spend their first two years in the College of Engineering. In general, students should choose that lower division preparation which is most closely related to the particular field and division of business administration they wish to enter.

It is highly desirable for candidates for admission to the School to complete the lower division prerequisites prior to entrance (see below). In addition to the minimum specific requirements, introductory work in economic geography and economic history is highly recommended. Students wishing to take advanced work in mathematics may elect Mathematics 3A-3B, Plane Analytic Geometry and Calculus, or Mathematics 11A-11B, Analytic Geometry and Calculus, instead of Mathematics 2, Mathematics of Finance and Business. Normally, however, students will take Mathematics 2, Mathematics of Finance and Business, which provides the minimum essentials for the courses in accounting, corporation finance, investments, and business administration in general.

The Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science are intended to provide for all students not only a broad knowledge of the background and chief functions of modern business enterprise, but also elementary training in the use of the professional tools of accounting, statistics, and economic analysis. Since many students are unable to decide upon the specific field or position for which they wish to train, and since some shift into other positions than those anticipated, it is highly important that all have the common basis of fundamental training. On this foundation they can readily build for specific types of needs. But students are normally expected to begin to specialize by electing 9 units of concentration beyond the introductory course in one field (see below). Under the advisory procedure of the School, concentration may be approved in other fields than those listed below if the total program of the student is soundly conceived in terms of his future interests and needs. It is hoped that some students will wish to propose programs integrating work in other fields of training, such as agricultural economics, public administration, and mechanical engineering (see below).

In order to qualify for the degree of Bachelor of Science in the School, the student must have received 120 units of credit with at least a C average. All candidates for the degree of Bachelor of Science entering the School of Business Administration after attendance at other colleges or schools of this University or other institutions, with senior standing at the time of admission, are required to have been enrolled during the senior or final year in resident courses of instruction at this University in the School of Business Administration. At least 24 units (12 units each semester) must be completed in this period. It is permissible to offer 12 units completed in two consecutive summer sessions as equivalent to one semester; but the student must complete in resident instruction at least one regular semester of his senior year. The candidate shall have maintained at least a C average in basic upper division courses in business administration and economics and in all courses offered as concentration (taken at the University of California) in satisfaction of the requirements for the degree of Bachelor of Science in business administration.

Below are listed the specific requirements for the degree of Bachelor of Science. For further information see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION.

I. Prerequisite Courses:

A. Required:

Economics 1A-1B (Elements of Economics)	6 units
Economics 2 (Elementary Statistics)	3
Mathematics 2 (Mathematics of Finance and Business)	3
(See page 123 for possible substitutions)	

B. Recommended:

Geography 5A-5B (Economic Geography)	6
(Required of all foreign trade majors)	
Economics 10 (Economic History)	3

II. Basic Courses:

A. Required of all:

American History and Institutions	0
Business Administration 1A-1B (Accounting)	6
Business Administration 18, 105 (Commercial Law)	6
Business Administration 100 (Economics of Enterprise)	3
Business Administration 101 (Business Fluctuations and Forecasting)	3
Business Administration 190 (Business Organization and Management)	3
Business Administration 160 (Marketing)	3
Business Administration 131 (Corporation Finance)	3
Business Administration 150 (Industrial Relations)	3
	30 units

B. A semester course from one of the following courses:

Business Administration 135 (Economics of Insurance)	
Business Administration 180 (Introduction to Real Estate and Urban Land Economics)	
Economics 135 (Money and Credit)	
Economics 170A (Inland Transportation)	
Economics 190A (International Economic Relations)	3 units

III. Concentration:

Nine units beyond the introductory course in one field 9 units

The following fields of concentration are approved: accounting, banking and finance, business statistics, foreign trade, industrial management, insurance, marketing (including retailing, wholesaling, sales management, industrial purchasing, advertising, and cooperative marketing), industrial relations and personnel management, real estate and urban land economics, transportation and traffic management, and public utilities.

Students who do not wish to elect one of the above fields of concentration may receive permission to (1) fulfill the requirements of the major in the Department of Economics, (2) elect special programs with the permission of the Dean (such programs may be in other fields, for example: agricultural economics, civil engineering, electrical engineering, forestry, geography, journalism, mathematics, mechanical engineering, political science, psychology, and public administration).

Honors

Honors at graduation.—Students whose work has been of marked excellence receive honors at graduation.

The Degree of Master of Business Administration

Normally, students should not undertake full specialization until after the completion of work for the bachelor's degree. The programs of work for the degree of Master of Business Administration will give opportunity for advanced and specialized training based upon the fundamental curriculum for the degree of Bachelor of Science. The master's degree will require a minimum residence of two full semesters after the receipt of the bachelor's degree.

For detailed information concerning the requirements see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION, or the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

SCHOOL OF EDUCATION

The School of Education offers professional courses intended for students preparing for educational service in elementary, junior high, secondary schools, and colleges; for graduate students who are fitting themselves for supervisory or administrative positions in elementary schools; and for students who propose to engage in school administration, to teach in state colleges or in university departments of education, or to carry on research work in the field of education.

GENERAL REQUIREMENTS

Teacher-Training Curricula

The students must satisfy the following general requirements to complete a teacher-training curriculum leading to a recommendation for a teaching credential.

Scholarship.—The School of Education will admit to candidacy for recommendation only those students who have maintained a grade-point average of not lower than 1.5 in the work undertaken in the junior and senior years. Candidates with grade-point shortages may apply to the Dean of the School for consideration and advice.

Oral English.—The student must prove that he has a command of spoken English adequate to the purposes of instruction. He may satisfy this requirement by examination, by completing suitable courses in the Department of Speech, or by any other test satisfactory to the committee.

Health Certificate.—The student must take a medical examination and obtain a satisfactory certificate from the University Physician.

Citizenship.—Each applicant for a credential is required by the State Department of Education to be a citizen of the United States. Noncitizens who have filed their first papers are eligible to apply for short-term credentials. Failure

to complete the naturalization process within six months of the date of eligibility will result in the revocation of the credential. After a foreign student has become naturalized he may apply for a long-term credential.

Oath of Allegiance.—The State Department of Education also requires each applicant for a credential to take an oath of allegiance to the United States.

American History.—All persons planning to teach are required to take a course in United States history in college.

American Institutions.—See statement on page 00 concerning this requirement.

Approval of Schedules.—As early as possible in his academic career, the student should consult Miss Murdock, Credentials Assistant, 107 Haviland Hall.

Each prospective candidate for a teaching credential first must file an application for admission to graduate standing with the Dean of the Graduate Division, 102 Administration Building. This application must be accompanied by a bank draft or money order for the \$5 application fee, which is payable to The Regents of the University of California, and official transcripts of his high school and college or university records. (The transferred graduate student must also furnish a transcript of his college or university work to the Dean of the School of Education when he files his preliminary application.) On the basis of transferred records the Dean of the Graduate Division issues a statement of the student's official status. The student must present this statement when he files his preliminary application for the teaching credential. His study list cannot be approved until this application has been made.

Application for Credential and for Supervised Teaching.—Detailed schedules of procedures may be obtained from 107 Haviland Hall. Applications for supervised teaching 320c must be made in 107 Haviland Hall not later than November 1, 1949, for the spring semester, 1950, and not later than April 1, 1950, for the fall semester, 1950. Enrollment is limited to available facilities.

State Credential Fee.—An application to the State Department of Education for a teaching credential must be accompanied by a fee of \$3. The health certificate fee is \$5 for all applicants.

SPECIFIC REQUIREMENTS

The General Secondary Credential

Requirements.—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on page 125.

1. He must spend two graduate semesters at this University during which he completes a minimum of 24 units of upper division and graduate work with a grade-point average of not lower than 1.75. At least 6 of these units must be in graduate courses, or in upper division courses accepted by the School of Education as substitutes for graduate courses, in the fields of the teaching major or minor, or both. (In order to maintain graduate residence for higher

degrees, the student must take at least 4 units in upper division or graduate courses in the semester in which he is enrolled in Education 320c.)

2. He must complete with a scholarship average of at least one grade point the following 18 units in Education (the State Department of Education requires that at least 6 units in education be completed in the graduate year):

Education 110 (Educational Psychology)	3 units
Education 111 (Growth and Development of the Child)	2
Education 170 (Secondary Education)	2
Electives	3
Education 320A (Supervised Teaching)	1
Education 320B (Instructional Resources)	2
Education 320C (Supervised Teaching)	3
Education 320E (Professional Methods)	2

Total 18 units

The candidate should note the following:

(a) Students are advised to distribute this work over the junior, senior, and graduate years as follows: Education 110 and 111 in the junior year; Education 170, 320A, and 320B in the senior year; Education 320C and 320E in the graduate year.

(b) Psychology 1A or its equivalent is prerequisite to these courses.

(c) Credit in courses offered in the Department of Education for a teacher's credential may not be obtained by examination.

3. He must complete a teaching major and a teaching minor selected from at least two of the following fields of University studies:**

- (1) Agriculture
- (2) Art
- (3) Business education
- (4) English or speech
- (5) Foreign language (French or German or Italian or Latin or Spanish).
Under certain circumstances both a major and a minor in foreign language may be allowed. Consult Mr. J. U. MICHAELIS concerning this or concerning the use of other foreign languages as a major or minor.
- (6) Homemaking
- (7) Librarianship
- (8) Life science
- (9) Mathematics
- (10) Music
- (11) Physical education
- (12) Physical science
- (13) Social studies*

** For requirements for the teaching majors and teaching minors consult the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

* There is no "social studies" major for the A.B. degree in the College of Letters and Science. An applicant wishing to offer a teaching major in the "social studies" ordinarily would have as his A.B. major some aspect of the social studies, such as history, economics, political science, etc., or a group major, or a general curriculum major.

The Teaching Major.†—There are two kinds of teaching majors. The first consists of 18 to 24 units of upper division and/or graduate work, the precise amount to be agreed upon by the School of Education in consultation with the subject representative in the department or departments concerned (ordinarily 18 units of the teaching major shall be selected from the departmental major for the bachelor's degree). The second consists of a minimum of 36 units of upper division and/or graduate work in two or more related subjects (e.g., social studies), this major being fixed by the School of Education in consultation with the subject representatives of the departments concerned. In addition to the foregoing minimum requirements, the School of Education will prescribe such graduate courses designed for teachers as may be organized by the various departments; and, in agreement with the subject representative, such other courses, either graduate or undergraduate, as may be found necessary, provided the total number of units required for any subject does not exceed 36.

The Teaching Minor.—The teaching minor in any subject consists of not less than 18 units, ordinarily in a department or field of studies other than the teaching major, and not less than 9 units of this total shall consist of upper division and/or graduate courses (except as recommended by the department or departments concerned to the School of Education).

4. He must maintain the following scholarship ratings in the various classifications of this work:

- Upper division work: a grade-point average of at least 1.50
- Postgraduate work: a grade-point average of at least 1.75
- Education courses: a grade-point average of at least 1.00
- Work for the major: a grade-point average of at least 1.75
- Work for the minor: a grade-point average of at least 1.00

The Junior College Credential

Requirements.—The candidate for the recommendation for this credential must fulfill the specific requirements listed below, in addition to the general requirements described on pages 125–126.

1. He must complete two semesters of work in residence at this University.
2. He must hold a master's or doctor's degree from this University, or from another institution recognized as equivalent by the Graduate Division, in one of the following fields of study: agriculture, anatomy, anthropology, architecture, art, astronomy, bacteriology, botany, business administration, chemistry, decorative art, economics, engineering, English, French, geography, geology, German, Greek, history, home economics, Italian, Latin, librarianship, mathematics, mining and metallurgy, music, paleontology, philosophy, physical education, physics, physiology, political science, psychology, sociology and social institutions, Spanish, zoölogy. The major for the master's or doctor's degree is recognized as the teaching major if it is in one of the above fields.

† A combination teaching major and minor may be worked out in certain fields utilizing the basic courses as fundamental to both the teaching major and teaching minor.

3. He must complete a teaching minor in one of the above fields or in a field chosen from the list of teaching majors for the general secondary credential (page 127).

4. He must complete with a scholarship average not lower than one grade point at least 12 units in education courses, including:

Educational Psychology—Education 110.....	2-3 units
The Junior College—Education 279.....	2
Supervised Teaching and Professional Methods:	
(a) Teaching Assistants on the campus will take Education 320B, 324 and Education 320E, Section 16	8
(b) All other students will take Education 320A, 320B, 320C, and 320E, Section 16.....	8
Total	12-13 units

5. He must maintain the following scholarship ratings in the various classifications of his work:

- Upper division work: a grade-point average of at least 1.50
- Postgraduate work: a grade-point average of at least 1.75
- Education courses: a grade-point average of at least 1.00
- Work for the major: a grade-point average of at least 1.75
- Work for the minor: a grade-point average of at least 1.00

6. Before final action is taken by the School of Education concerning the recommendation for the junior college credential, the candidate must present a report concerning his attainments and fitness from the professor in charge of his higher degree program. In the case of students transferring with higher degrees from other institutions, the chairman of the department in question at the University of California should be asked for such a recommendation.

The General Junior High School Credential and General Elementary Credential

Requirements.—The candidate for the recommendation for either or both of these credentials must satisfy the following specific requirements, in addition to the general requirements described on page 125.

1. He must hold a bachelor's degree from one of the academic colleges of this University or its equivalent.

2. He must take one semester of graduate work.

3. He must maintain the following scholarship ratings in the various classifications of his work:

- Upper division work: a grade-point average of at least 1.50
- Postgraduate work: a grade-point average of at least 1.50
- Education courses: a grade-point average of at least 1.00
- Work for the major: a grade-point average of at least 1.00
- Work for the minor: a grade-point average of at least 1.00

4. He must complete with a scholarship average of not lower than one grade point the following courses:

For the General Elementary Credential:

	Units
Introduction to Educational Psychology—Education 110.....	3
Growth and Development of Children—Education 111.....	2
Elementary Education—Education 130.....	3
Arithmetic and Language in the Elementary School—Education 131..	2
Art and Music in the Elementary School—Education 132.....	2
Reading and Literature in the Elementary School—Education 134...	2
Social Studies in the Elementary School—Education 138.....	2
Supervised Teaching, Professional Methods—Education 320A, Section 2; 320C, Section 2; 320E, Section 15.....	6
Supervised Teaching: Materials of Instruction and Class Management—Education 321	2
Total.....	24

For the General Junior High School Credential:

The student must complete the courses specified above for the general elementary credential and in addition complete the following course:

Junior High School Education—Education 172..... 2 units

5. Recommended Sequence of Courses:

Low junior semester: Education 110 and Education 130 if possible.

High junior semester: Education 130, Education 111 and one of the following: Education 134, Education 138.

Low senior semester: Education 320A, Section 2 and two of the following: Education 131, Education 132, Education 134, Education 138.

High senior semester: Education 320A, Section 2, Education 131, Education 132, Education 134, Education 138.

Graduate semester: Education 320C, Section 2, Education 320E, Section 15, Education 321.

6. He must complete, with a scholarship average of at least 1.00, a major and minor in the following fields of university studies:

- (a) Art
- (b) English and speech
- (c) Foreign language
- (d) Home economics
- (e) Mathematics
- (f) Music
- (g) Natural science
- (h) Physical education
- (i) Social studies
- (j) Psychology, with emphasis on child and clinical psychology
- (k) Group majors chosen from: American civilization, American literature, Far Eastern studies, international relations, physical education, recreation, sociology. In each case the major must be approved by the Director of Supervised Teaching.

- (1) Regional group majors chosen from: China, Hispanic America, Russia and Eastern Europe, social welfare, wildlife conservation. In each case the major must be approved by the Director of Supervised Teaching.

A major for this credential consists of the 24-unit departmental major offered in satisfaction of requirements for the A.B. degree.* In addition, the 36-unit general (nonmajor) curriculum offered in satisfaction of requirements for the A.B. degree may be offered in lieu of the departmental major provided certain requirements for this major are included in addition to the "36 upper division units named in the Letters and Science List and distributed through not more than three departments with a maximum of 30 units in any one department." The major for this credential must include at least 12 upper division units in one of the above fields of university studies and a total of 24 units in that field. A minor consists of 12 units, at least 6 of which are in upper division courses.

7. The student who desires to qualify for the General Secondary Credential, well as for the General Elementary Credential and/or the General Junior High School Credential, must include in his program at least three semesters of work beyond the bachelor's degree.

If a student elects the general curriculum or a group major for his A.B. degree he must be sure to include in his major the requirements for the teaching major (24 units in one of the above fields, at least 12 of which are in upper division courses), and the requirements for the teaching minor (12 units in one of the above fields, at least 6 of which are in upper division courses).

SCHOOL OF FORESTRY

The School of Forestry, which replaced the curriculum in forestry of the College of Agriculture, July 1, 1946, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science, Master of Forestry, and Master of Science.

ADMISSION TO THE SCHOOL OF FORESTRY

Candidates for admission to the School of Forestry must qualify in the following ways:

- A. Completion of at least 60 units of work in one of the colleges of the University of California, preferably the preforestry curriculum of the College of Agriculture; or admission to the University in junior standing. In all cases junior standing requires the completion of 60 units of work acceptable to the Board of Admissions of the University.

* The *departmental major* offered in satisfaction of the requirements for the A.B. degree must be in one of the fields listed above in order to use it for a teaching major.

B. The candidate must have the following preparation for courses in the curriculum of the School of Forestry:*

	Units
1. Botany (general botany)	5
(This requirement is based on Botany 1 as given at Berkeley. In institutions where such a concentrated course is not available, a year course in general botany is required.)	
2. Chemistry (general inorganic, and organic).....	8
3. Engineering (plane surveying).....	6
4. Economics (elements of economics).....	6
5. Geology (structural)	3
6. Mathematics (analytic geometry and differential calculus) .	6
7. Physics (general physics with laboratory).....	8
8. Statistical methods	3
9. Zoölogy (general biology).....	3
10. A choice of English, speech, or philosophy.....	6
Total	54

C. Completion of the field practice course, Forestry 49A-49B.

D. No student with a grade-point average of less than one (C average) in the subjects listed in Section B above will be admitted.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

Undergraduate students must complete the following requirements for a bachelor's degree:

1. The equivalent of eight semesters' residence, the senior year of which must be spent at this University.

2. One hundred twenty-four units of study with 124 grade points, exclusive of the field practice course, Forestry 49A-49B. Thirty-six of the 124 units must be in upper division courses, and at least 60 units must be completed in the School of Forestry. This total of 60 units, however, may be reduced in the case of students admitted to the School with advanced standing.

3. The removal of any deficiencies in the following courses usually taken in high school: mathematics, 3 years, including plane geometry, algebra, and trigonometry.

4. An examination in English composition known as Subject A. Students who fail in this examination are required to take the course in Subject A, which yields no unit credit toward the degree and for which a fee of \$20 is charged.

* If applicants are otherwise qualified they may be admitted to the summer field practice course, Forestry 49A-49B, and the School of Forestry with certain subject shortages in this list. No listing of specific permissible shortages can be made as they depend upon the practicability of the student carrying a full program of required forestry courses concurrently with the removal of shortages in preforestry requirements. This must be determined for each individual case. Nevertheless, it may be said that shortages of over 12 units in the subjects listed, or a shortage of either general botany or Engineering 1A, will make it impossible for a student to take Forestry 49A-49B or to be admitted to the School of Forestry. Students desiring further information should communicate with the School of Forestry, University of California, Berkeley 4.

5. The University requirement of American History and Institutions, either by examination or by passing certain specified courses.

6. The University requirement of 8 units of Military Science and Tactics.

7. The field practice course, Forestry 49A-49B, in camp at Meadow Valley, near Quincy, in the Plumas National Forest.

8. In addition to requirements 3 and 5 above, University preforestry courses as listed above for admission to the School, and courses in the School of Forestry as follows:

	Units
1. Botany (plant physiology with laboratory)	4
2. Economics or business administration (other than statistics)	3
3. Plant pathology or taxonomic botany.....	3
4. Soil science	4
5. Zoölogy, upper division, or entomology.....	3
6. Forestry courses at Berkeley (including Forestry 100, 103, 104, 108, 110, 120, and 128)	30

PLAN OF STUDY

The Curriculum of the School of Forestry

A single curriculum is offered in the School of Forestry, arranged to give a solid broad training and at the same time to permit specialization. In view of the limited number of specialized positions that are annually available, undergraduate work should remain broad and general; otherwise a man may prepare himself for a particular field in which there may be no opening for many years. There are certain exceptions, however, to this recommendation. Range management, for example, is a highly specialized field, for which the student should start to prepare himself in the junior year. The closely allied study of wildlife management (fish and game), may be undertaken best by taking the curriculum in wildlife conservation in the College of Letters and Science, which includes 18 units of forestry in its requirements.

Preforestry

The schedule of study offers a broad basic training in the first four semesters. To complete his work for the degree of Bachelor of Science in the normal eight-semester period, the student should adhere closely to the recommended program, which follows. It enables him to complete the maximum number of lower division courses in an orderly manner and without conflicts. Much of this work is prerequisite to necessary courses in the School of Forestry and thus the student is prepared to make an advantageous selection of electives and a logical arrangement of requirements in the School of Forestry.

Undergraduate Departments

Freshman Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chemistry 1A	5	Chemistry 8	3
Geology 1	3	Zoology 10	3
Speech 1A or English 1A	3	Speech 1B or English 1B	3
Mathematics 3A	3	Mathematics 3B	3
Military Science	2	Military Science	2
	<hr/>		<hr/>
	16		14

Sophomore Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Physics 2A, 3A	4	Physics 2B, 3B	4
Engineering 1A†	3	Engineering 1B	3
Economics 1A	3	Economics 1B	3
Botany 1*	5	Statistics	3
Military Science	2	Military Science	2
	<hr/>		<hr/>
	17		15

In the summer following his sophomore work, the student must attend the field practice course, Forestry 49A-49B. *This course is prerequisite to admission to the School of Forestry.* See below for further information.

Junior Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Forestry 100	3	Forestry 110	3
Forestry 103	3	Forestry 128	3
Forestry 108	4	Botany 111	4
Elective	6	Plant Pathology 100 or Botany 108	3 or 4
	<hr/>	Elective	3
	16		<hr/>
			16 or 17

Senior Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Forestry 104	4	Forestry 120	4
Soil Science 100	4	A course in economics	3
Entomology 114	3	Zoology 116	3
Elective	6	Elective	6
	<hr/>		<hr/>
	17		16

† One year of geometrical drawing and one-half year of trigonometry are prerequisite to engineering and also necessary for forestry courses. They should be taken in high school. The University does not offer a course in geometrical drawing.

* Students who prepare for forestry at other institutions which do not offer a one-semester course in botany (equivalent to Botany 1) should take a general botany course. This does not take the place of 4 units of plant physiology with laboratory (Botany 111).

The student specializing in range management must include in his 30 units of forestry at Berkeley, Forestry 101, Forestry 102, and Forestry 123 (in the senior year). He must, of course, also fulfill the prerequisites for Forestry 123, namely, Forestry 101, 103, Engineering 1A-1B, and Botany 108 and 111.

Field Practice Course

Students majoring in forestry are required to attend, after completing their sophomore work, the summer field practice course (Forestry 49A-49B), which is conducted in the Summer Camp of the School of Forestry, at Meadow Valley, near Quincy, in the Plumas National Forest, a leading timber-producing area of the State. The twelve weeks are spent in field work—land surveying, timber surveying, timber estimating, forest mapping, and scaling; in the study of silviculture and tree growth; and in examining logging and milling operations.

GRADUATE STUDY

The Master's Degree

Opportunity is offered for graduate study in forestry leading to the degree of Master of Science, under Plan I, or Master of Forestry, under Plan II.

The degree of Master of Science requires 20 units of upper division and graduate courses, of which at least 8 units must be strictly graduate work in the major subject, and the satisfactory completion of a thesis. The degree of Master of Forestry requires 24 units of upper division and graduate courses, of which at least 12 units must be in strictly graduate courses in the major subject, and a comprehensive final examination.

Advancement to candidacy for either degree also presupposes the completion of undergraduate requirements in forestry equivalent to those prescribed at the University of California. Except for making up deficiencies in the undergraduate requirements, the graduate student's program may be planned largely to meet his individual needs and interests. The arrangement is flexible enough so that the student may either include a broad preparation for professional work or specialize and give a greater part of his time to a specific problem.

The Doctor's Degree

Study and research on a suitable problem in forestry leading to the degree of Doctor of Philosophy may also be undertaken. For training in silviculture, forest ecology, range management, or forest influences, the program ordinarily would be administered by the Plant Physiology or Soil Science groups, which include members of the forestry teaching staff. For training in forest economics or management, the candidate would usually work with the Division of Agricultural Economics. The program would include the fulfillment of the minimum requirements of the group or division, together with research and a dissertation on a forest problem appropriate to the combined fields of forestry and plant physiology, or forestry and soil science, or forestry and economics, depending on the individual student's choice.

SCHOOL OF JURISPRUDENCE

Preparation for the Study of Law

For the guidance of students who may become applicants for admission to the School, the essentials of a satisfactory prelegal education are summarized as follows:

In the first place, *the prelegal student should follow a plan of study which will assure adequate foundations for broad culture.* Such a plan should include among its objectives: (1) a well-grounded facility in the use of English, written and spoken, and a wide acquaintance with the best of English literature; (2) a familiarity with at least the outlines of human history and a thorough knowledge of the history of our own country and people; (3) an acquaintance with the great philosophers and an understanding of the progress and significance of philosophic thought; (4) a mastery of elementary logic and mathematics and some acquaintance with their application in contemporary life; (5) an introduction to natural science and an appreciation of its tremendous importance in the modern world; and (6) a thorough knowledge of the elements of social science, including the essentials of economics, government, psychology, and other important social studies. Foundations must be laid in high school for the study of English, history, mathematics, and natural science. The prelegal student normally will be well advised to defer philosophy and the social studies until he has entered college. If prelegal study is planned effectively, the foundations for a broad culture may be laid in high school and in the first two years of college.

In the second place, *the prelegal student should acquire the intellectual discipline and experience which are to be derived from intensive work for a substantial period of time in a selected field of study.* This work should be carefully planned, and a special competence should be achieved in the selected field. It has often been found that a well-chosen group of courses in economics may be related effectively to later professional study in law. An effective pre-professional training may also be planned with emphasis upon political science, history, business administration, psychology, English, philosophy, or similar fields. College courses in commercial or business law, planned primarily for non-prelegal students, should be included in the prelegal program only when they are prerequisite to other college work.

In the third place, *the prelegal student should begin the cultivation of professional standards of study as early as possible.* Few ideas are more fallacious or harmful than the notion that it is possible to dawdle through high school and college and then make the adjustment to higher standards promptly upon entering the professional school. Essential habits of concentration and effective methods of study must be acquired and developed during the prelegal years. Careful reading and constant exercise of practice in writing should be cultivated assiduously. Intelligently selected private reading should supple-

ment the work of the classroom at all times. The law as a process of social adjustment is reflected in all aspects of life, and the student who carelessly wastes the opportunities of his prelegal years cannot possibly present himself well prepared for professional training. A large proportion of failures in the professional school may be traced directly to the neglect of opportunities in high school and college. Distinguished achievement in high school and college is usually followed by distinction in the professional school and in later law practice.

Copies of a memorandum (designed primarily for prelegal students at the University of California) entitled "Recommended Courses for Prelegal Students" may be obtained from the Office of the Dean, School of Jurisprudence, Berkeley 4. The offices of the prelegal advisers are located in Boalt Hall. Prelegal students are not required to discuss their programs with a prelegal adviser. Students who have special problems, however, should not hesitate to seek advice.

Law School Admission Test

The School of Jurisprudence is now cooperating with the Educational Testing Service and with other law schools in the development and administration of a uniform Law School Admission Test. The test is designed to measure aptitude for professional study, rather than knowledge of subject matter, and no special preparation is necessary. Centers where the test may be taken have been established for the convenience of applicants in all parts of the country. *The test is required of all applicants for admission to this School and should be taken during the academic year preceding the one for which admission is sought.* For application procedures see Admission Procedure, page 138.

The Educational Testing Service will supply each applicant with a bulletin of information giving details with respect to administration and including practice questions. All questions concerning the Law School Admission Test should be addressed directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey.

Admission to the Professional Curriculum

Applicants for admission to the professional curriculum of the School of Jurisprudence, leading to the degree of Bachelor of Laws, must have received the degree of Bachelor of Arts or Bachelor of Science from the University of California, or an equivalent degree from a college or university of approved standing.

Applicants are also required (1) to have pursued a program of prelegal study in substantial conformity with the essentials of a satisfactory prelegal education (see page 136), (2) to have achieved a minimum grade-point average of 2.0 (B average) in the work of the last two prelegal years, and (3) to have achieved a satisfactory score on the Law School Admission Test.

Applicants having somewhat less than the B average but otherwise qualified

may be admitted if the score on the Law School Admission Test gives exceptional evidence of capacity for the work of the professional curriculum. Applicants having substantially less than the B average will ordinarily be denied admission without reference to the Law School Admission Test. Applicants are warned that the School's accommodations are limited and that an increasing proportion of applicants are qualifying on the basis of a B average.

Applicants must also submit satisfactory references as to character, including the names and addresses of not fewer than three disinterested and responsible persons to whom the applicant is well known and to whom the faculty may appropriately address inquiries with respect to the applicant's character. Wherever possible, the character references should include a member of the Bar who is a graduate of the School of Jurisprudence or of another law school approved by the American Bar Association.

Applicants who have completed at least one year of work in another law school may be admitted to the second year of the professional curriculum with credit for not more than one year of such work if (1) the applicant would have been eligible for admission to the first year in this School, (2) the work has been completed in a school which is a member of the Association of American Law Schools, and (3) the work for which credit is sought has been of superior grade. The faculty reserves the privilege of prescribing further conditions for the granting of such credit and may, in its discretion, require examinations in subjects for which credit is sought.

Students who have been disqualified at another law school will not be admitted to this School.

The professional curriculum is so arranged that beginning students must enter the school at the opening of the fall semester. To be assured of satisfactory programs, students transferring from other law schools should also plan to enter at the opening of the fall semester.

Admission Procedure*

1. The initial application for admission to the School of Jurisprudence should be made on forms which will be supplied by the School and should be addressed to the School of Jurisprudence, University of California, Berkeley 4. It should be accompanied by transcripts of all college, university, or professional school records other than the records of work completed at the University of California, Berkeley. Where the applicant is currently in a college or university, the transcripts should cover all work completed to date and should be accompanied by a statement indicating the time when it is expected that the work pending will be completed and the necessary supplemental transcripts supplied. To insure consideration of an application for admission in September, 1950, the initial application must be received by the School not later than May 1, 1950. Actual receipt of the initial application by the School is the applicant's respon-

* Applications for admission in 1949 closed May 2, 1949. The procedure herein applies to the class entering in the fall semester of 1950.

sibility. In no circumstances should the initial application be addressed to another department or office of the University.

2. Applicants are also required to apply for admission to the Graduate Division. This application should be made on forms which will be supplied by the Graduate Division and should be addressed to the Graduate Division, University of California, Berkeley 4, accompanied by a remittance in the sum of \$5 payable to The Regents of the University of California. The remittance of \$5 is not required of veteran applicants who expect to enroll under the provisions of Public Law 346 (the G.I. Bill of Rights) or Public Law 16. This application must also be accompanied by official transcripts of records other than the records of work completed at the University of California, Berkeley. Such transcripts are in addition to those accompanying the initial application to the School of Jurisprudence. Since applicants cannot be admitted to the School until they have been admitted to graduate standing, the application should be filed at the earliest possible date.

3. For permission to take the Law School Admission Test, applicants will write directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey, requesting an application blank and bulletin of information listing places where the test may be taken and the dates on which the test will be given. If the applicant so requests on the test application form, his score will be reported not only to this law school but also to other law schools where he may be applying for admission. He will also receive an individual score report directly from the Educational Testing Service.

Admission to the Graduate Curriculum

The student who wishes to extend and deepen his knowledge of law or to prepare himself for legal research or law teaching may become a candidate for the degree of Master of Laws (LL.M.) or the degree of Doctor of the Science of Law (*Juris Scientiae Doctor*, J.S.D.).

Admission to the graduate curriculum leading to the degree of LL.M. may be granted to graduates of an approved college or university who also hold a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, give evidence of capacity to continue their studies in law with superior achievement.

Admission to the graduate curriculum leading to the degree of J.S.D. may be granted to graduates of an approved college or university who also hold a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, give evidence of ability to conduct with distinction a program of research in a selected field of the law.

If the previous training of an applicant for admission to the graduate curriculum has been received in foreign educational institutions, he must present evidence that his preparation is substantially equivalent to that required for graduation from an American college or university.

SCHOOL OF LIBRARIANSHIP

The School of Librarianship offers a two-year curriculum. To students completing the first year with an average grade of at least C+ (1.5 grade-point average) during each semester, the Bachelor of Library Science degree is awarded. The degree of Master of Library Science is granted to students completing the second-year curriculum with an average grade of at least B.

The A.B. degree of the University of California or its equivalent, a grade-point average of at least 1.5 (C+) in the last two years of academic work, full graduate standing in the University, and a college year each of two modern languages—preferably French and German—are required for admission. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Applicants are required to take the Profile Tests of the Graduate Record Examination and to have their scores sent to the School in time for evaluation before final action is taken on their applications. Applications for admission to the first-year curriculum will ordinarily not be considered from persons over 35; exceptions may be made for those holding advanced degrees or for those who have had successful library experience. Applicants must submit to the Dean of the School complete transcripts of their academic records so that their qualifications for admission to the School may be determined. New first-year students will not be admitted at the beginning of the spring semester.

Curriculum for the bachelor's degree.—The School's basic curriculum is designed to prepare municipal, county, college, university, school, children's and special librarians. To insure adequate opportunity for students who enroll in the School, only a limited number will be accepted for the first-year curriculum. No one should come to Berkeley without having made application to the School and having received notice of acceptance. Early application is desirable and after the class has been selected, opportunity to enter is dependent on withdrawal of someone previously accepted.

The curriculum in librarianship is planned to occupy a student's entire time and only the superior student who has had considerable library experience should expect to do any outside work. It is highly desirable that students come to Berkeley with sufficient funds to meet all first-semester expenses and that they refrain from outside work until their first-semester grades demonstrate that such additional work can be carried without detriment to their studies.

Curriculum for the master's degree.—Candidates for the master's degree must be accepted in full graduate status in the University of California and must have completed with a scholarship grade of at least B the first-year curriculum in a graduate (Type I or II) library school, accredited by the American Library Association and approved by the University of California.

Any course in the second-year curriculum is open to any graduate student who satisfies the instructor of his ability and preparation to undertake the

work, even though he is not a candidate for a master's degree in this School and cannot qualify for it.

Candidates for the master's degree are subject to all general University regulations governing that degree (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

MEDICAL SCHOOL

Matriculation.—For matriculation in the Medical School—the four-year curriculum leading to the degree of Doctor of Medicine—the student must have attained senior standing in the premedical curriculum in the College of Letters and Science (see page 79).

Applicants for admission to the Medical School are required to take the Medical College Admission Test, administered for the Association of American Medical Colleges by the Educational Testing Service of Princeton, New Jersey, given at various colleges and universities, including the University of California. The date of the examination, to be held in the fall in Berkeley, will be announced later.

Applications for admission to the Medical School should be filed with the Admissions Office, 103 Pharmacy Building, University of California, Medical Center, San Francisco 22, California. Applications for the September, 1950, first-year class may be filed between October 1, 1949, and November 30, 1949, but no application blanks will be issued by the Admissions Office after November 15, 1949. It will not be possible to give a statement of tentative acceptance to any applicant.

Enrollment in the Medical School is limited. Candidates for admission to the first-year class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. Two personal interviews are held. Each applicant must also take the Medical College Admission Test.

With exception of the five out-of-State applicants mentioned below, all of those selected for the class will be California applicants. To be considered a California applicant, a student must (a) have completed *sixty units* or more of premedical work in a college or university in this State, or (b) must be a *legal resident* of the State of California who lived in the State *prior* to the beginning of his premedical work and who left the State *temporarily* for completion of all or part of his premedical work.

Not more than *five* students will be accepted who have taken their premedical work outside of the State of California.

(a) Of these five, *four* will ordinarily be selected from the following Western states not having medical schools: Nevada, Arizona, Idaho, Montana, Wyoming, and New Mexico, or from the Territory of Hawaii. To be considered in this category, *the applicant must be a legal resident of the state concerned* (or of the Territory of Hawaii).

(b) Ordinarily not more than one applicant will be accepted from outside of the continental United States and Hawaii. This applicant must have completed at least one year at the University of California or at an equivalent institution in the United States, one semester of which must have been completed previous to February 15 of the year of admission.

An accepted applicant who finds it impossible to begin his work in the Medical School in September, 1950, or a student who actually enters at that time and begins his work, but finds it necessary to withdraw in his first year, loses his place and is required, in the event he desires to begin his work later, to reapply with a subsequent group of applicants. Applicants for admission to the Medical School are required to pass a satisfactory medical examination for physical and mental fitness prior to the time of first registration in the School. Students in attendance in San Francisco are examined annually.

The state law governing the practice of medicine in California prescribes that every person, before practicing medicine or surgery, must produce satisfactory testimonials of good moral character and a diploma issued by some legally chartered medical school, the requirements of which shall have been, at the time of granting such diploma, in no particular less than those prescribed by the laws of the State, and which shall have received the approval of the Board of Medical Examiners that year. The requirements for matriculation in the University of California Medical School cover also the requirements of the Association of American Medical Colleges, provided that the high school program includes physics and chemistry.

All of the above is subject to change by such emergencies as may arise.

For further information see the annual ANNOUNCEMENT OF THE MEDICAL SCHOOL, to be obtained from the Dean's office, University of California Medical School, Medical Center, San Francisco 22, California.

Training Courses for Technicians

Training courses for technicians in medical technology, orthoptics, physical therapy, and X ray are offered at the Medical Center, San Francisco.

MEDICAL TECHNOLOGY

The University of California Medical School offers a training program to students preparing to be medical technicians.

Admission. To be eligible for admission, applicants must have completed at least three years of college work, including Biochemistry 101 and Bacteriology 101, or the equivalent of these courses. Preference is given to applicants who hold a degree of A.B. or B.S. with a major in one of the biological sciences.

Curriculum. The course is in the form of a practical apprenticeship. It consists of twelve months of full-time work, and covers training in biochemistry, parasitology, mycology, medical bacteriology, blood bank procedures, serology, clinical pathology, histological technic, basal metabolism, and electrocardi-

ography. Upon satisfactory completion of the course, the student is eligible for the National Registry Examination. If the student holds a degree of Bachelor of Arts or Bachelor of Science, he is also eligible to take the State examination.

Certificate. A certificate is given upon the completion of the course.

Fees. Fees are as follows:

	FIRST SEMESTER		SECOND AND THIRD SEMESTERS	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$35.00	\$35.00	Same as first semester	

For further information, write to the Supervisor, Medical Technicians' Curriculum, University of California Medical School, San Francisco 22, California.

ORTHOPTICS

A course of eight months for orthoptic technicians is given at the University of California Hospital.

Admission. Minimum prerequisite is a bachelor's degree or its equivalent. Candidates with previous teaching experience are preferred but this experience is not essential. A personal interview with the Director of the Orthoptic Clinic will precede acceptance.

Curriculum. Student technicians will attend lectures or act as assistants in the Orthoptic Department of the Eye Clinic from 8:30 A.M. to 4:30 P.M. daily throughout the academic year. The training is devised so that the students will have the necessary knowledge and experience to qualify for the examinations given by the American Orthoptic Council.

Certificate. A certificate is given upon completion of the course.

Fees. Fees are as follows:

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Tuition Fee	200.00*	200.00***
	<hr/>	<hr/>	<hr/>	<hr/>
	\$235.00	\$235.00	\$ 35.00	\$ 35.00

For further information, write to the Supervisor, Orthoptic Technicians Course, University of California Hospital, San Francisco 22, California.

PHYSICAL THERAPY

The requirements for admission to the curriculum in physical therapy offered by the University of California Medical School, meet and exceed those set by the Council on Medical Education and Hospitals of the American Medical Association.

* The \$200 tuition fee covers the course of eight months and is payable only once.

Admission. Applicants for admission must satisfy one of the following requirements:

1. Bachelor's degree from an accredited institution.

Candidates for admission on this basis must have completed 26 semester units of biological and physical science. Upon satisfactory completion of the course, the student is awarded a certificate.

2. Three years of college or university training.

Candidates for admission on this basis must have completed courses that qualify them for senior standing in the College of Letters and Science of the University of California, and the requirements in the basic sciences of the curriculum in physical therapy. The student may matriculate into the Medical School in his fourth year of college and obtain the degree of Bachelor of Science from the Medical School with a major in physical therapy.

Applicants for admission must present transcripts from his college or university. Such records must show the satisfactory completion of the following courses, or their equivalent:

Chemistry 1A—

5 units or 5 semester hours—(general inorganic chemistry)

Physics 2AB and 3AB—

8 units or 8 semester hours—(general physics)

Anatomy 102—

3 units or 3 semester hours—(general human anatomy)

Physiology 1 and 1L—

5 units or 5 semester hours—(introductory physiology)

Psychology 168—

3 units or 3 semester hours—(abnormal psychology)

Curriculum.—Two semesters will include all theory, seminars, and demonstration. The final sixteen weeks will be devoted to practical training and can be completed in approved hospitals. The curriculum includes anatomy, physiology, physics, pathology, psychology, surgery, orthopaedic surgery, medicine, neurology, pediatrics, nursing, ethics and administration, electrotherapy, radiation, hydrotherapy, massage, kinesiology, therapeutic exercise, and clinical practice.

Fees. Fees for the first and second semesters are as follows (there being no fees for the third semester):

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Tuition Fee	75.00	150.00	75.00	150.00
	\$110.00	\$185.00	\$110.00	\$185.00

For further information, write to the Medical Director, Curriculum in Physical Therapy, University of California Hospital, San Francisco 22.

X-RAY TECHNICIANS

A training program for students desiring to become X-ray technicians is offered at the University of California Hospital. This course extends through a full year.

Admission: In the selection of students, preference is given

- first, to graduate nurses and university graduates who have taken science to the extent of at least Physics 2A-2B and 3A-3B and Anatomy 102;
- second, to students who have had university training in the above subjects but who have not graduated;
- third, to students who have graduated from high school. Students with no more than high school graduation are seldom accepted unless better qualified students are not available.

Women students are preferred, but men are not excluded.

Since personality, as well as scholarship, is important in dealing with sick people, an interview with the Medical Director precedes acceptance. If the applicant lives at a great distance, special arrangements for an interview can be made.

The course starts annually on September 1. The number of students is limited to six per year.

Curriculum: The student technicians are given practical training in all parts of the Division of Radiology. In addition they are given instruction by seminars and lectures at weekly intervals throughout part of the year. The program is designed so that the student at the completion of the course will have been trained in all procedures used in making X-ray examinations and treating with X ray, will thoroughly understand darkroom methods, will understand the service required of a technician in the fluoroscopic room, will be able to assist in any radiation therapy (but *not* treat patients), and will understand the filing of films, reception of patients, and other incidentals necessary to the operating of an X-ray office or department.

Certificate: A certificate of completion of the curriculum is given at the end of the course.

Fees: The student must supply his own maintenance and uniforms.

Fees are as follows:

	FIRST SEMESTER		SECOND AND THIRD SEMESTERS	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$35.00	\$35.00	Same as first semester	

For further information concerning the program, write to the Medical Director, X-ray Technicians Course, University of California Hospital, San Francisco 22, California.

SCHOOL OF NURSING

The School of Nursing offers three curricula leading to the degree of Bachelor of Science and certificates of completion in nursing, public health nursing, and nursing education. A graduate curriculum leading to the degree of Master of Science is also offered.

UNDERGRADUATE CURRICULUM

The undergraduate curriculum is designed to prepare young women for participation in community health programs. This leads to the degree of Bachelor of Science and the Certificate of Completion in Nursing.

The nurse of today is expected to be able to assist with the care of the sick, the prevention of disease, and the maintenance of health. Through class work, conferences, and supervised practice the student is given an opportunity to learn the care of patients in the hospital and in the home, the measures which are used to teach health and prevent disease, and the community resources for the handling of the health problems of its citizens.

Requirements for Admission

The completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science or the College of Applied Arts is required for admission to the School of Nursing. The work taken to satisfy this requirement must include the specified courses outlined on page 67 of this bulletin.

Enrollment in the School of Nursing is limited, and candidates for admission are accepted on the basis of scholarship in the prenursing program and on physical fitness as determined by careful examination. The Committee on Admissions to the Nursing School is authorized to refuse admission to a student with a low academic record, and reserves the right to reject any applicant on the ground of obvious physical, mental, or moral disability.

Students completing the curriculum in the School of Nursing must take the State Board Examination in order to secure their licenses to practice in this State. An applicant for this examination must either be a citizen of the United States or have declared his intention to become a citizen of the United States.

The following program, if satisfactorily completed, will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester.

<i>First Year</i>		<i>Second Year</i>	
	<i>Fall Units</i>	<i>Spring Units</i>	
Subject A . . . . .	..	..	Physiology 1 and 1D 5 ..
Chemistry 1A and 8	5	3	Anatomy 102 3
Bacteriology 2 . . . . .	..	4	Psychology 1A 3 ..
English or Speech (year course)	3	3	Year course 3 3
Year course	3	3	‡Electives 4 9
‡Electives	4	2	
	<hr/>	<hr/>	
	15	15	15 15

The American History and Institutions examination, or courses in satisfaction of the requirement, should be completed. See page 39.

For information concerning the program in the School of Nursing see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

CURRICULA FOR GRADUATE NURSES

Bachelor of Science Degree

This curriculum leads to the Bachelor of Science degree and to the Certificate of Completion in either public health nursing or nursing education. The purpose is to prepare nurses for staff positions in public health nursing agencies or clinical teaching and departmental supervision in schools of nursing.

Requirements for Admission

The courses comprising the curricula for graduate nurses are given in the College of Letters and Science and in the School of Nursing. Graduates of approved nursing schools who have met the matriculation requirements of the University may obtain the Bachelor of Science degree on completion of the following:

1. The requirements for the degree of Associate in Arts in the College of Letters and Science at Berkeley or at Los Angeles, or for the degree of Associate in Arts in the College of Applied Arts, Los Angeles, including such special requirements as may be prescribed by the Faculty of the School of Nursing.

2. At least 60 units of such additional work as may be prescribed by the Faculty of the School of Nursing. Not more than 30 units of work completed in a school of nursing other than that of the University of California will be accepted in partial satisfaction of this requirement.

In coöperation with the United States Public Health Service and the Langley Porter Clinic, a major in nursing education with specialization in advanced psychiatric nursing has been established under the provisions of the National Mental Health Act. The requirements for admission to the psychiatric program are the completion of the Associate in Arts degree, as indicated below,

‡ Must include foreign language if necessary to satisfy Associate in Arts requirements.

with the addition of Psychology 33, 3 units, and Sociology and Social Institutions 1A-1B, 6 units. Psychiatric experience is advantageous.

The final year in all cases must be spent in study in the academic departments of the University of California.

PROGRAM SATISFYING REQUIREMENTS FOR THE
DEGREE OF ASSOCIATE IN ARTS

(For graduates of approved schools of nursing)

	<i>First Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (English Composition).....	..	..	..
Foreign language	4	4	4
*Natural science	5	3	3
English or speech (year course).....	3	3	3
Year course	3	3	3
Electives .....	..	2	2
		15	15
<i>†Second Year</i>			
Psychology 1A	3	..	..
Natural science	4	..	..
Year course	3	3	3
‡Electives	5	5	12
		15	15

PROGRAM IN THE SCHOOL OF NURSING LEADING TO THE
DEGREE OF BACHELOR OF SCIENCE

§Third Year

	<i>Mini- mum Units</i>	<i>Maxi- mum Units</i>		<i>Mini- mum Units</i>	<i>Maxi- mum Units</i>
15 units selected from:			15 units selected from:		
Medical nursing	2	3	Nutrition	3	6
Surgical nursing	2	3	Social aspects of nursing	2	3
Obstetrical nursing	2	3	History of nursing	2	3
Pediatric nursing	2	3	Preventive medicine	3	3
Communicable disease nursing	1	2	Public health nursing	3	3
Psychiatric nursing	1	2	Child hygiene	2	3
Pharmacology	1	2	Child psychology	2	3
Principles and practice of nursing	2	3	Principles of health teaching	1	3
Pathology	1	2	Professional adjustments of graduate nurse	1	3
	14	23		19	30

* Chemistry 1A (5), Physiology 1, 1L (5), and Anthropology 1 (4) recommended.

† For a complete statement of the requirements for the degree of Associate in Arts in the College of Letters and Science, see page 67.

‡ Must include foreign language if necessary to satisfy Associate in Arts requirements.

§ Requirements of this year can be met wholly or in part through courses taken in another school of nursing. Courses which do not meet the minimum credit are not accepted in meeting these requirements.

Fourth Year

General Requirements

Education (including Education 110).....	5 units
Socioeconomics (including Social Welfare 100).....	5 units
‡American History and Institutions.....	courses or examination

Major in Nursing Education		Major in Public Health Nursing	
	Units		Units
General Requirements	10	General Requirements	10
Nursing 432	2	Public Health 145	3
Nursing 434	3	Public Health 105	3
*Electives	15	Education 151 or 152	2
		Nursing 416A	3
		Nursing 418-419	6
		Electives	3
	30		30

The degree of Bachelor of Science will be conferred upon completion of the program set forth above. An additional semester of field work (Nursing 420 or Nursing 433) must precede the granting of the Certificate in Public Health Nursing or the Certificate in Nursing Education.

For more detailed information regarding this program, students should refer to the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

Master of Science Degree

The School of Nursing offers a curriculum leading to the Master of Science degree in the fields of nursing education and public health nursing. This is to prepare nurses for administrative, supervisory, and teaching positions in schools of nursing and public health agencies.

Requirements for Admission

The student must qualify for full graduate status in the Graduate Division, Northern Section. This includes the completion during the last two years of her college course of 36 units of advanced (upper division) academic work based on proper prerequisites, including at least 15 units of advanced fundamental work basic to the proposed major subjects for a higher degree. In addition, she must be certified by the Department of Nursing to be eligible to complete the program for a higher degree. She should have had at least two years of successful experience in clinical nursing practice, clinical instruction, or experience in a community health agency.

‡ For list of courses accepted in fulfillment of the requirement of American History and Institutions, or for other means of satisfying the requirement, see page 39.

* Students specializing in psychiatric nursing should include in their program, in lieu of electives: Anthropology 118A, Education 153, Psychology 112 and 163, and Sociology 148.

The candidate will follow Plan 1 or 2 as outlined by the Graduate Division, Northern Section. Twelve units of work will be selected from courses numbered in the 200 series in nursing and twelve from upper division and graduate courses in fields related to the student's major program.

Fees and Expenses

While the student is in residence at Berkeley, she will be required to meet all the expenses outlined in earlier pages of this bulletin.

For expenses of students at the University of California Medical Center in San Francisco, see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

For further information address the Dean of the School of Nursing, University of California Medical Center, San Francisco 22, California, or the Chairman of the Department of Nursing, Life Sciences Building, University of California, Berkeley 4, California.

SCHOOL OF OPTOMETRY

The School of Optometry offers a curriculum of three years after the completion of requirements for the degree of Associate in Arts in the College of Letters and Science, and leading to the degree of Bachelor of Science at the end of two years, and the Certificate in Optometry and the Master of Optometry degree at the end of an additional graduate year.

Admission to the School of Optometry is limited. Candidates for admission to the first year (junior) class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. In addition, each applicant may be required to take a professional aptitude test.

At least 45 of the 50 applicants admitted to the first year (junior) class must be California applicants. Up to as many as five applicants will be accepted who are not legal residents of California. These nonresidents will be selected from states west of the Mississippi, or from foreign countries, not having optometry schools. Not more than one foreign applicant will be accepted each year.

To be considered a California applicant, a student must be a legal resident of the State of California and

- (a) have completed 45 or more units of the preoptometry work in a college or university in the State of California, or
- (b) have resided in the State prior to the beginning of his preoptometry work and left the State temporarily for the completion of all or part of the preoptometry work.

Applications for admission for the fall semester of any year must be filed with the University Admissions Director by May 1 of that year in order to receive consideration. The application for admission must be accompanied by a certificate from a physician which states in detail the physical condition of the applicant based upon a thorough medical examination; any physical or mental handicap of the applicant should be indicated.

For admission to the School of Optometry the applicant is required to show completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science. The courses taken for the degree of Associate in Arts should include the following specific subjects required by the School of Optometry: plane analytic geometry, chemistry, physics, zoölogy, anatomy, bacteriology, psychology, and speech.

An accepted applicant who finds it impossible to begin his work in the School of Optometry in September, 1949, or a student who finds it necessary to withdraw during his first (junior) year, loses his place and must apply for admission with a subsequent group of applicants should he desire to continue his work in optometry.

The following program if satisfactorily completed will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester, and the prerequisite subjects for the study of optometry, provided the following high school subjects have been offered for matriculation: algebra, plane geometry, trigonometry, chemistry, physics, and three years of a foreign language.

PREOPTOMETRY CURRICULUM

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
¹ Subject A			Military Science	2 or 0	2 or 0
Military Science	2 or 0	2 or 0	Physics 2A-2B	3	3
Speech 1A-1B	3	3	Physics 3A-3B	1	1
Foreign Language	4	4	Zoölogy 1A	4	
Chemistry 1A-8	5	3	Anatomy 102		3
Mathematics 8A		3	Psychology 1A-33	3	3
² Elective	1 or 3	0 or 2	Bacteriology 7		3
			² Elective	2 or 4	0 or 2
	15	15		15	15

The following required curriculum taken in the School of Optometry leads to the degree of Bachelor of Science at the end of the senior year and the Certificate in Optometry and the degree of Master of Optometry at the end of the graduate year. For further information and detailed degree requirements see the ANNOUNCEMENT OF THE SCHOOL OF OPTOMETRY.

¹ An examination in Subject A (English Composition) is required of all undergraduate entrants. For further regulations concerning Subject A, see page 38.

² See Associate in Arts degree requirements, College of Letters and Science, as described on page 67.

REQUIRED CURRICULUM IN OPTOMETRY

<i>Junior Year</i>				<i>Summer Session Program Following Junior Year</i>	
	<i>Fall Units</i>	<i>Spring Units</i>			
* American History and Institutions . . . . .		..	
Physiology 115	3	..			
Physics 108A-108B (2) . .	3	3			
Optometry 102A-102B . . .	3	4			
Optometry 401A-401B . . .	2	2			
Physiology 110A-110B . . .	3	3			
Elective	2	3			
	<hr/>	<hr/>			
	16	15			
 <i>Senior Year</i>			 <i>Graduate Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Optometry 101	3	..	Optometry 409A-409B . . .	6	6
Optometry 103A-103B . . .	3	3	Optometry 412A-412B . . .	2	2
Physiological Optics 105A-105B	3	3	Optometry 414A-414B . . .	2	2
Physiological Optics 106A-106B	1	1	Optometry 417		1
Optometry 404A-404B . . .	3	3	Physiological Optics 203 . .	2	..
Optometry 406A-406B . . .	1	1	Physiological Optics 205 . .		1
Optometry 407A-407B . . .	2	1	Elective	3	3
Elective . . . . .	..	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	15		15	15

SCHOOL OF PUBLIC HEALTH

Students who are considering a major in public health should report to the Dean's office, School of Public Health, as early in their academic career as possible. Formal application for admission to the School of Public Health should be made not later than the last semester of the sophomore year. Those applying for admission to the School any later may encounter difficulty in arranging proper sequences for prerequisite and required courses in the School of Public Health.

Admission.—To be admitted to the School of Public Health, students must have completed at least 60 units in one of the colleges of the University or an equivalent thereof satisfactory to the Faculty of the School of Public Health. In order to complete the work in the minimum number of semesters, students should also have completed the prerequisite courses listed below.

SUGGESTED LOWER DIVISION PROGRAM PREPARATORY TO
ADMISSION TO THE SCHOOL OF PUBLIC HEALTH(1) *General Requirements.*

Subject A. (See page 38.)

Military science and tactics (men). (See page 40.)

* Required of all candidates for the bachelor's degree; see page 39.

(2) *Preparation for the Major.*

A: Basic subjects required for all public health majors:

Public Health 5A-5B.

Bacteriology 2.

Chemistry 1A.

Physiology 1-1L or Zoölogy 1A or 10.*

Psychology 1A.

At least 6 units from:**

English 1A, 1B.

Speech 1A, 1B.

At least 6 units from:

Anthropology 2A, 2B.

Economics 1A, 1B.

Geography 1, 2.

Mathematics 3A, 3B.

Sociology and Social Institutions 10A, 10B.

B: Additional requirements for specific fields of emphasis within the public health major:

Laboratory (Public Health and Clinical)

Chemistry 1B, 5, 8.

At least Physics 10 (or high school physics).

Zoölogy 1A.

Preadministration

Business Administration 1A-1B.

Political Science 1.

Public Health Education

Public Health 35.

Physical Education Activities (2 units).

Public Health Sanitation

Chemistry 1B, 8.

Physics 2A-2B, 3A-3B.

Recommended electives: Engineering 8, 21, and 22.

Biostatistics

Mathematics 3A-3B.

PROGRAM IN THE SCHOOL OF PUBLIC HEALTH

Undergraduate Curricula

Candidates for the degree of Bachelor of Science must have completed at least 120 units of college work, not less than 24 units of which shall have been completed as a major student in the School of Public Health. The student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him in the University of California. He must have satisfied the requirement of American History and Institutions. (See page 39.)

* Zoölogy 10 not acceptable for laboratory or public health education major programs.

** Sanitarians are required to complete at least 3 units from this group instead of 6.

The Majors(1) *Laboratory (Clinical and Public Health)*

Public Health 100A, 147A, 147B, 150A-150B, 162.

Bacteriology 101.

Biochemistry 103.

Entomology 117.

Zoölogy 140.

Electives² and general University requirements.¹(2) *Preadministration*

Required for all preadministration majors:

Public Health 100A, 100B, 106, 110, 134, 162, 187.

Anthropology 118A, 118B.

Economics 130A, 130B, 185.

Political Science 182.

Psychology 145.

Plus one of these three groups:

A. Required for those interested in public health administration:

Public Health 147A, 147B, 170.

Bacteriology 107.

Political Science 183 and one of the following:

Political Science 155, 162, 172.

Electives and general University requirements.¹

B. Required for those interested in hospital management:

Public Health 145.

Business Administration 122, 151.

Electives and general University requirements.¹

C. Required for those interested in medical care administration:

Public Health 145, 170.

Political Science 155, 183.

Electives and general University requirements.¹(3) *Public Health Education*

Public Health 100A, 106, 110, 131, 134, 135, 145, 162.

Education 106, 110, 151, 152.

Home Economics 111 or 112A.

One course from:

Public Health 125.

Education 111.

Home Economics 134.

Psychology 112.

Six units from:

Upper division psychology.

Electives and general University requirements.¹(4) *Public Health Sanitation*

Public Health 100A, 110, 113A-113B, 114, 147A, 147B, 153, 162, 170.

Bacteriology 101 or 107.

Entomology 126.

Twelve units from either (A) or (B):

¹ The American History and Institutions requirement must be satisfied before graduation. (See page 39.)

² For those emphasizing clinical laboratory, Physics 2A-2B, 3A-3B, are recommended. For those emphasizing public health laboratory, recommended electives are other public health courses, Entomology 126, Food Technology 112B, 115B.

A. For students interested in the biological science aspects:

Public Health 112, 131, 186.
 Civil Engineering 123, 124.
 Food Technology 112, 113.
 Political Science 181, 183.
 Zoölogy 109.

B. For students interested in the physical science aspects:

Civil Engineering 108A,² 123, 124.
 Engineering 23, 35.
 Engineering Design 102B.
 Mathematics 4A, 4B.
 Mechanical Engineering 103,² 105A,² 105B,² or Civil Engineering 110.²
 Electives and general University requirements.¹

(5) *Biostatistics*

Public Health 100A, 110, Anatomy 102 (or Public Health 135), 160A, 160B, 161A, 161B, and at least one other statistics course.

Bacteriology 107.

At least 14 units from:

Other upper division public health courses.

At least 10 units from any courses in:

Economics.
 Mathematics.
 Psychology.
 Sociology.
 Zoölogy.

Electives and general University requirements.¹

Honors

Students whose work has been of marked excellence may receive Honors or Highest Honors at graduation.

Graduate Curricula

DEGREE OF MASTER OF PUBLIC HEALTH

Admission.—To be admitted to the curriculum leading to the degree of Master of Public Health, the student must have graduated from an approved medical school or college of dentistry, or have received a bachelor's degree with adequate training in mathematics and the natural sciences including chemistry, biology, and the social sciences; he must be qualified in some professional capacity for postgraduate education in public health; and must have, in addition, either

- (1) Professional academic qualification in engineering, nursing, education, or postgraduate work in other fields of public health; or
- (2) Three years of experience in responsible public health practice.

Those seeking the M.P.H. degree in the field of public health education are required to have had basic courses in education. An applicant for the M.P.H.

¹ The American History and Institutions requirement must be satisfied before graduation. (See page 39.)

² Prerequisite, Mathematics 4A-4B.

degree in the field of public health laboratory, public health statistics, and public health sanitation who does not have a doctoral degree must have completed the requirements of the major in his respective field at the University of California or the equivalent elsewhere. A student who has undergraduate deficiencies must remove them before he may complete the requirements of his curriculum.

General requirements for the degree:

- (1) At least one academic year of graduate residence at the University of California and a program including not less than 24 units of acceptable course work, of which at least 12 units must be graduate courses. An average of not less than two grade points per unit must be maintained. By special permission, a candidate may be authorized to present an acceptable thesis in lieu of 4 of the 24 units required.
- (2) A comprehensive final examination either in the student's field of specialization or in the general field of public health, as determined by the faculty committee.
- (3) At least twelve weeks of approved field service in a public health agency. This may be waived for those presenting evidence of previous qualifying experience.

DEGREE OF DOCTOR OF PUBLIC HEALTH

Admission.—To be admitted to the curriculum leading to the degree of Doctor of Public Health the student must ordinarily hold the M.D. degree. In exceptional cases, however, a candidate may be admitted who holds from an approved university a doctoral degree other than that of M.D. The candidate must have completed with a B average, or better, basic courses equivalent to those required for the degree of Master of Public Health at the University of California.

General requirements for the degree:

- (1) The candidate must have completed, with a B average or better, basic courses equivalent to those required for the degree of Master of Public Health.
- (2) In addition to requirement (1) above, the candidate must have completed in residence at the University of California at least one academic year of work involving advanced specialization in the particular field of public health for which he is preparing.
- (3) The candidate must have indicated his capacity to make a substantial contribution to the advancement of the science and art of public health by submitting a dissertation on a subject chosen by himself and bearing on his principal subject of study, and of such character as to show power to prosecute independent investigation. The dissertation must have received the approval of a special committee in charge of the dissertation, appointed by the Dean of the School of Public Health with the

approval of the Graduate Council, and must have been defended by the candidate before a committee appointed in the same manner and including the members of the special committee in charge of the dissertation. Special emphasis will be laid upon the requirement of a dissertation, and the degree will in no case be given merely for the faithful completion of a course of study, however extensive.

- (4) The candidate must have demonstrated ability for practical leadership in his field, either
- (a) By prior successful professional experience in a post involving the exercise of substantial initiative and responsibility, or
 - (b) By such other means as the Faculty of the School of Public Health may prescribe.

SCHOOL OF SOCIAL WELFARE

The School of Social Welfare offers a graduate curriculum leading to the degree of Master of Social Welfare (M.S.W.). Some students prefer to enroll for only one academic year, two semesters of work, and to take junior professional positions at the conclusion of their first year of work. No credential is given at the end of the first year, but those who have satisfactorily completed the first year are eligible for junior membership in the American Association of Social Workers.

Requirements for admission.—Admission to the School of Social Welfare is limited to students who:

- (A) Hold the degree of Bachelor of Arts or Bachelor of Science from the University of California or an equivalent degree from a college or university of recognized standing, and who have established their eligibility for admission to graduate standing at the University of California.
- (B) Are not over 35 years of age; however, for persons who, through experience in the field, have demonstrated good capacity for social work, this requirement may be waived.
- (C) Are in good health, as indicated by a thorough medical and physical examination conducted by the University of California Student Health Service at time of registration.
- (D) Comply with either of the following requirements:
 - a. Completion of the group major in social welfare offered at the University of California, Berkeley, or of an equivalent group major.
 - b. Completion of the University of California courses listed below, or their equivalents, or presentation of satisfactory evidence (ordinarily by writing noncredit qualifying examinations) that they have adequate knowledge of the subject matter of such courses:
 1. Economics 1A-1B (Elements of Economics).
 2. Psychology 1A (General Psychology).

Undergraduate Departments

3. Economics 150 (Labor Economics) or some other course in social economics, such as Economics 152 (Labor Economics), Economics 180 (The Problems of Poverty), or Economics 185 (Social Insurance).
4. Psychology 160 (Mental Deficiency) or some other course in clinical or abnormal psychology.
5. Economics 2 (Elementary Statistics), Psychology 5 (Introduction to Psychological Measurements), or some other course in elementary statistical methods.

This requirement may be fulfilled, with respect to items 3, 4, and 5, by applicants submitting a plan satisfactory to the School whereby the requirement will be fully met within one calendar year after the date on which they enroll; and in the case of students who have completed one academic year of study at a graduate school of social work the requirement may be modified at the discretion of the School; but in no case will students be formally advanced to candidacy for the master's degree until the full requirement, or any modified requirement for students transferring from other graduate schools of social work, has been satisfied.

- (E) Satisfy the Admissions Committee of the School that they are also suitable in other respects for the profession of social work.

Undergraduate preparation.—The group major in social welfare, described on page 84, is strongly recommended for students preparing for admission to the School of Social Welfare. Alternatively, they may take undergraduate majors in economics, psychology, political science, or sociology, or a group major in social science, these majors to include the prerequisite courses listed above. Students looking toward social work training should consult the School of Social Welfare as early as possible in their college careers for advice.

Requirements for the master's degree.—The degree of Master of Social Welfare (M.S.W.) will be granted to students who:

- (a) Have been admitted to the School of Social Welfare in accordance with the regulations of the Academic Senate.
- (b) Have spent two years of graduate study in social welfare, including at least one year in residence at the University of California (Berkeley).
- (c) Have completed a program of study approved by the School, according to one of the following plans:

Plan 1. There are required at least 40 units and in addition a thesis. The courses must be professional, graduate, and upper division courses. They must include, as a minimum, 20 units of *graduate* and *upper division* courses completed with an average grade not lower than B.

Plan 2. There are required at least 44 units and in addition a comprehensive final examination in the field of social welfare. The courses must be professional, graduate, and upper division courses. They must include, as a minimum, 24 units of *graduate* and *upper division* courses completed with an average grade not lower than B.

- (d) Students who have completed courses which are part of the social welfare curriculum in an accredited school of social welfare elsewhere than at the University of California, *may* be granted credit for such courses to the value of not more than 24 units. Not more than 4 such units will be accepted, however, toward satisfaction of the required 20 or 24 units in upper division and graduate courses. Such students must have maintained an average grade not lower than B in all those upper division and graduate courses undertaken in graduate residence at the University of California.

Dates for filing applications.—Admission to the School of Social Welfare is possible only in the fall of each year. Applications should be submitted as early as possible between the first day of January and the fifteenth day of May of the year in which the student wishes to begin his work. Application forms may be obtained at the School of Social Welfare, 2400 Allston Way, Berkeley 4, California.

For further information see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

CURRICULUM IN HOSPITAL DIETETICS

The Department of Home Economics of the College of Agriculture, with the approval of the Graduate Council, is authorized to issue a Certificate in Hospital Dietetics to students who complete with an average grade of at least B the curriculum described below, and an internship of 4 months approved by the curriculum adviser.

Requirements for admission.—Applicants must hold a bachelor's degree with a major in the field of food and nutrition, including quantitative techniques, from a university or college of recognized standing, must present satisfactory certificates of health, and, in addition, must have the approval of the department committee concerned with the training in hospital dietetics.

Course of study.—The curriculum extends over a period of at least one calendar year, including one semester of residence at the University of California Hospital in San Francisco and one semester of residence at the University of California in Berkeley. During the residence in San Francisco the student must complete 8 units of instruction and supervised practice in hospital dietetics, and during the residence in Berkeley 10 to 15 units of work, partly in graduate

courses, and ordinarily including courses in human nutrition or diet in disease, laboratory methods in metabolism or advanced biochemistry, marketing or business administration, and hospital dietetics.

All inquiries should be addressed to the Chairman of the Department of Home Economics, University of California, Berkeley 4.

THE GRADUATE DIVISION

FOR INFORMATION concerning all matters pertaining to the Graduate Division, including the list of available fellowships and graduate scholarships, also the requirements for higher degrees, see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be obtained from the Dean of the Graduate Division.

Advanced instruction is offered by the University of California leading to certificates and to the several degrees of Master of Science, Master of Arts, Master of Business Administration, Master of City Planning, Master of Criminology, Master of Dental Surgery, Master of Education (I, emphasis Agriculture; II, offered jointly with California state colleges; III, professional emphasis), Master of Engineering, Master of Forestry, Bachelor of Library Science, Master of Library Science, Master of Science in Nursing, Master of Optometry, Master of Public Health, Master of Social Welfare, Doctor of Education, Graduate in Architecture, Civil Engineer, Electrical Engineer, Mechanical Engineer, Metallurgical Engineer, Mining Engineer, Petroleum Engineer, Bachelor of Laws, Master of Laws, Juris Scientiae Doctor, Doctor of Medicine, Doctor of Public Health, Doctor of Veterinary Medicine, and Doctor of Philosophy.

**COURSES OF INSTRUCTION OFFERED IN THE
DEPARTMENTS AT BERKELEY
FOR THE FALL AND SPRING SEMESTERS
ACADEMIC YEAR 1949-1950**

Explanatory Note

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to February); II, second semester (February to June); Yr., throughout the first and second semesters. Information concerning class hours will be found in the SCHEDULE AND DIRECTORY.

Year courses; double numbers.—A course designated by a double number (for example, History 4A-4B) is continued through two successive semesters, ordinarily from September to June; occasionally, however, the first part of a year course may begin in February. The student should use the first number in registering for the course during its first semester, and the second number during its second semester. The first half of such a course is prerequisite to the second half unless there is an explicit statement to the contrary. A final report is made by the instructor at the end of each semester. The student may discontinue the course at the end of the first semester, with final credit for the first half of the course, except as otherwise noted.

Classification and Numbering of Courses—

Courses are classified and numbered as follows:

(1) *Lower division courses* (numbered 1-49, or sometimes indicated by letters if in subjects usually given in high school). A lower division course is one open to freshmen and to sophomores; such courses do not count as upper division work in any department.

(2) *Upper division courses* (numbered 100-199). An upper division course in any department is one which is open to those students only who have completed a lower division course, or courses, in that department; or is an elementary course in a subject of such difficulty as to require the maturity of upper division students.

Special study courses for advanced undergraduates are numbered 199. Credit in a special study course for undergraduates may not exceed 5 units a semester, except in the case of honor students.

Departments may offer special *honors courses* (marked H) in reading and research, with credit to be determined by the instructors in charge, according to the performance of the individual students, subject to such general restrictions as may be imposed by the department, the College, or the Committee on Courses of Instruction of the Academic Senate. The work of the student in an honors course may consist of additional work in connection with other courses of instruction, or may be independent of such courses.

(3) *Graduate courses* (numbered 200-299). As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation normally consists of the completion of at least 12 units of upper division work basic to the subject to the graduate course, irrespective of the department in which such basic work may have been completed.

(4) *Professional teacher-training courses* in the Department of Education and courses in other departments that are specially intended for teachers or prospective teachers (numbered 300-399).

(5) *Certain professional courses* in anthropology, art, home economics, music, nursing, optometry, public health, and social welfare (numbered 400-499).

Courses are further classified as follows:

Resident courses.—Courses of resident instruction are given either during regular sessions or summer sessions or (by special arrangement) as extra session courses. Laboratory, field, or other individual work, done out of session under the direction of a department of instruction, may be accepted upon the recommendation of the department in partial fulfillment of the residence requirement for the bachelor's degree. All such work is in the form of upper division or graduate extra session courses, and these courses must be approved in advance by the Committee on Courses of Instruction. Moreover, in pursuance of existing regulations, students must register in advance for all such work, and this registration must be approved by the proper faculty before the work is undertaken.

University Extension courses.—In the curricula leading to the A.B. and B.S. degrees, credit is allowed for courses in University of California Extension that bear numbers prefixed by X, XB, XL, or XSB. Such courses are rated, with respect to the general and specific requirements for the bachelor's degree, on the same basis as courses taken in residence at collegiate institutions of approved standing.

For information concerning University Extension courses, apply to the Director, University Extension, University of California, Berkeley 4, California.

AGRICULTURE†‡

- ² RICHARD L. ADAMS, M.S., Sc.D. (hon.c.), Professor of Farm Management.
FRANK W. ALLEN, M.S., Professor of Pomology, Davis.
VIGFUS S. ASMUNDSON, Ph.D., Professor of Poultry Husbandry, Davis.
ROY BAINER, M.S., Professor of Agricultural Engineering, Davis.
HORACE A. BARKER, Ph.D., Professor of Soil Microbiology (Chairman of the Division of Plant Nutrition).
LEON D. BATCHELOR, Ph.D., Professor of Horticulture, Riverside.
MURRAY R. BÉNÉDICT, Ph.D., Professor of Agricultural Economics.
JAMES P. BENNETT, Ph.D., Professor of Plant Physiology.
GEOFFREY B. BODMAN, Ph.D., Professor of Soil Physics (Chairman of the Division of Soils).
ALFRED M. BOYCE, Ph.D., Professor of Entomology, Riverside.
FRED N. BRIGGS, Ph.D., Professor of Agronomy, Davis (Chairman of the Division).
FREDERICK A. BROOKS, M.E., D.Sc., Professor of Agricultural Engineering, Davis.
HUGH S. CAMERON, D.V.M., Ph.D., Professor of Veterinary Science, Davis.
HOMER D. CHAPMAN, Ph.D., Professor of Agricultural Chemistry, Riverside.
ROY E. CLAUSEN, Ph.D., Professor of Genetics (Chairman of the Division).
HAROLD H. COLE, Ph.D., Professor of Animal Husbandry, Davis.
IRA J. CONDIT, Ph.D., Professor of Subtropical Horticulture, Riverside.
JOHN P. CONRAD, Ph.D., Professor of Agronomy, Davis.
ALDEN S. CRAFTS, Ph.D., Professor of Botany, Davis.
WILLIAM V. CRUESS, Ph.D., Professor of Food Technology.
LUTHER D. DAVIS, Ph.D., Professor of Pomology, Davis.
JOHN E. ECKERT, Ph.D., Professor of Entomology, Davis.
HENRY E. ERDMAN, Ph.D., Professor of Agricultural Economics.
KATHERINE ESAU, Ph.D., Professor of Botany, Davis.
EDWARD O. ESSIG, M.S., Professor of Entomology (Chairman of the Division).
STANLEY B. FREEBORN, Ph.D., Sc.D. (hon.c.), Professor of Entomology (Vice-Chairman of the Department of Agriculture).
MAX W. GARDNER, Ph.D., Professor of Plant Pathology (Chairman of the Division).
HAROLD GOSS, Ph.D., Professor of Animal Husbandry, Davis.
PAUL W. GREGORY, Sc.D., Professor of Animal Husbandry, Davis.
² HAROLD R. GUILBERT, M.S., Professor of Animal Husbandry, Davis.
HANS N. HANSEN, Ph.D., Professor of Plant Pathology.
GEORGE H. HART, M.D., D.V.M., Professor of Veterinary Medicine, Davis.
WILLIAM Z. HASSID, Ph.D., Professor of Plant Nutrition.
WILLIAM R. HINSHAW, D.V.M., Ph.D., Professor of Veterinary Science, Davis.

† Herein are described the courses in the Department of Agriculture to be given at Berkeley, fall and spring semesters, 1949-1950, with lists of courses to be given at the College of Agriculture at Davis and at the Citrus Experiment Station at Riverside that are likely to be of interest to students in the College of Agriculture, resident in Berkeley, in planning their programs for the degree of Bachelor of Science. For description of courses given at Davis, Los Angeles, and Riverside refer to the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for 1949-1950, to be obtained from the Dean of the College of Agriculture, University of California, Berkeley 4.

‡ The designation "Davis" or "Riverside," etc., following the title of officers of instruction indicates that instruction is offered by the instructor named on that campus. Otherwise instruction is on the Berkeley campus.

² In residence spring semester only, 1949-1950.

- ROBERT W. HODGSON, M.S., Professor of Subtropical Horticulture, Los Angeles (Vice-Chairman of the Department of Agriculture).
- WILLIAM M. HOSKINS, Ph.D., Professor of Entomology.
- ELMER H. HUGHES, Ph.D., Professor of Animal Husbandry, Davis.
- CLAUDE B. HUTCHISON, M.S., LL.D., D.Agr. (hon.c.), Professor of Agriculture (Chairman of the Department of Agriculture).
- EUGENE L. JACK, Ph.D., Professor of Dairy Industry, Davis.
- HANS JENNY, Sc.D., Professor of Soil Chemistry and Morphology.
- MAYNARD A. JOSLYN, Ph.D., Professor of Food Technology.
- JAMES B. KENDRICK, Ph.D., Professor of Plant Pathology, Davis.
- MAX KLEIBER, Sc.D., Professor of Animal Husbandry, Davis.
- LEO J. KLOTZ, Ph.D., Professor of Plant Pathology, Riverside.
- JAMES E. KNOTT, Ph.D., Sc.D. (hon.c.), Professor of Truck Crops, Davis.
- LYSLE D. LEACH, Ph.D., Professor of Plant Pathology, Davis.
- SAMUEL LEPKOVSKY, Ph.D., Professor of Poultry Husbandry.
- ² JOHN H. MACGILLIVRAY, Ph.D., Professor of Truck Crops, Davis.
- GORDON MACKINNEY, Ph.D., Professor of Food Technology.
- BEN A. MADSON, B.S.A., Professor of Agronomy, Davis.
- SYLVESTER W. MEAD, M.S., Professor of Animal Husbandry, Davis.
- ROBERT F. MILLER, M.S., Professor of Animal Husbandry, Davis.
- BEN D. MOSES, B.S., Professor of Agricultural Engineering, Davis.
- EMIL M. MRAK, Ph.D., Professor of Food Technology (Chairman of the Division).
- COURTLAND S. MUDGE, Ph.D., Professor of Bacteriology, Davis.
- STUART A. PEOPLES, M.D., Professor of Comparative Pharmacology, Davis.
- RUSSELL L. PERRY, M.E., Professor of Agricultural Engineering, Davis.
- EDWARD L. PROEBSTING, Ph.D., Professor of Pomology, Davis.
- VERNON J. PURYEAR, Ph.D., Professor of History, Davis.
- THOMAS E. RAWLINS, Ph.D., Professor of Plant Pathology.
- WILLIAM M. REGAN, M.A., Professor of Animal Husbandry, Davis.
- CHESTER L. ROADHOUSE, D.V.M., Professor of Dairy Industry, Davis.
- WILFRED W. ROBBINS, Ph.D., Professor of Botany, Davis.
- EDWARD B. ROESSLER, Ph.D., Professor of Mathematics, Davis.
- KNOWLES A. RYERSON, M.S., Professor of Horticulture, Davis.
- HARRY W. SHEPHERD, B.S., Professor of Landscape Design.
- HARRY S. SMITH, M.A., Professor of Entomology, Riverside.
- WILLIAM C. SNYDER, Ph.D., Professor of Plant Pathology.
- G. LEDYARD STEBBINS, Ph.D., Professor of Genetics.
- MORRIS A. STEWART, Ph.D., Professor of Parasitology.
- TRACY I. STORER, Ph.D., Professor of Zoölogy, Davis.
- LEWIS W. TAYLOR, Ph.D., Professor of Poultry Husbandry (Chairman of the Division).
- H. EARL THOMAS, Ph.D., Professor of Plant Pathology.
- JAMES M. TINLEY, Ph.D., Professor of Agricultural Economics.
- WARREN P. TUFTS, Ph.D., Professor of Pomology, Davis (Chairman of the Division).
- H. LELAND VAUGHAN, B.S., Professor of Landscape Design (Chairman of the Division).
- FRANK J. VEIHEMEYER, Ph.D., Professor of Irrigation, Davis.
- EDWIN C. VOORHIES, B.S., Professor of Agricultural Economics.

² In residence spring semester only, 1949-1950.

- HARRY B. WALKER, C.E., Professor of Agricultural Engineering, Davis.
SIEGFRIED V. WANTRUP, D.Agr., Professor of Agricultural Economics.
DAVID WEEKS, Ph.D., Professor of Agricultural Economics.
THOMAS E. WEIER, Ph.D., Professor of Botany, Davis.
HARRY R. WELLMAN, Ph.D., Professor of Agricultural Economics (Chairman of the Division).
EDWARD E. WILSON, Ph.D., Professor of Plant Pathology, Davis.
JAMES F. WILSON, M.A., LL.D., Professor of Animal Husbandry, Davis.
ALBERT J. WINKLER, Ph.D., Professor of Viticulture, Davis.
CELESTE T. WRIGHT, Ph.D., Professor of English, Davis.
HERBERT A. YOUNG, Ph.D., Professor of Chemistry, Davis.
FRANK ADAMS, M.A., LL.D., Professor of Irrigation, Emeritus.
ERNEST B. BABCOCK, M.S., Professor of Genetics, Emeritus.
JAMES T. BARRETT, Ph.D., Professor of Plant Pathology, Emeritus.
ELBERT T. BARTHOLOMEW, Ph.D., Professor of Plant Physiology, Emeritus, Riverside.
JOHN S. BURD, B.S., Professor of Plant Nutrition, Emeritus.
WALTER H. DORE, B.S., Professor of Plant Nutrition, Emeritus.
JOHN W. GREGG, B.S., Dr. Land. Arch., Professor of Landscape Design, Emeritus.
DENNIS R. HOAGLAND, M.A., Professor of Plant Nutrition, Emeritus.
WALTER L. HOWARD, Ph.D., Professor of Pomology, Emeritus, Davis.
WALTER P. KELLEY, Ph.D., Professor of Soil Chemistry, Emeritus.
HENRY J. QUAYLE, M.S., Professor of Entomology, Emeritus, Riverside.
HOWARD S. REED, Ph.D., Professor of Plant Physiology, Emeritus.
RALPH E. SMITH, D.Sc., Professor of Plant Pathology, Emeritus.
EDWIN C. VAN DYKE, M.D., Professor of Entomology, Emeritus.
MAYNARD A. AMERINE, Ph.D., Associate Professor of Enology, Davis.
PETER A. ARK, Ph.D., Associate Professor of Plant Pathology.
DANIEL I. ARNON, Ph.D., Associate Professor of Plant Nutrition.
STANLEY F. BAILEY, Ph.D., Associate Professor of Entomology, Davis.
GEORGE A. BAKER, Ph.D., Associate Professor of Mathematics, Davis.
RAYMOND G. BRESSLER, Jr., Ph.D., Associate Professor of Agricultural Economics.
REID M. BROOKS, Ph.D., Associate Professor of Pomology, Davis.
LAWRENCE L. CLAYPOOL, Ph.D., Associate Professor of Pomology, Davis.
JOHN S. COLE, Major, Infantry; Associate Professor of Military Science and Tactics, Davis.
RODERICK CRAIG, Ph.D., Associate Professor of Insect Physiology.
GLEN N. DAVIS, Ph.D., Associate Professor of Truck Crops, Davis.
LANNES E. DAVIS, Ph.D., Associate Professor of Soils, Davis.
JULIUS H. FREITAG, Ph.D., Associate Professor of Entomology.
MILTON E. GARDNER, Ph.D., Associate Professor of Physics, Davis.
FREDERICK L. GRIFFIN, M.S., Associate Professor of Agricultural Education, Davis.
TRIMBLE R. HEDGES, Ph.D., Associate Professor of Agricultural Economics, Davis.
WILLIAM B. HEWITT, Ph.D., Associate Professor of Plant Pathology, Davis.
SIDNEY S. HOOS, Ph.D., Associate Professor of Agricultural Economics.
JAMES A. JENKINS, Ph.D., Associate Professor of Genetics.
CLARENCE N. JOHNSTON, M.E., Associate Professor of Irrigation, Davis.
F. HOWARD KRATZER, Ph.D., Associate Professor of Poultry Husbandry, Davis.

- GEORGE M. KUZNETS, Ph.D., Associate Professor of Agricultural Economics.
 I. MICHAEL LERNER, Ph.D., Associate Professor of Poultry Husbandry.
 E. GORTON LINSLEY, Ph.D., Associate Professor of Entomology.
 FREDERICK W. LORENZ, Ph.D., Associate Professor of Poultry Husbandry,
 Davis.
 R. MERTON LOVE, Ph.D., Associate Professor of Agronomy, Davis.
 GEORGE L. MARSH, M.S., Associate Professor of Food Technology.
 GEORGE L. MEHREN, Ph.D., Associate Professor of Agricultural Economics.
 MILTON A. MILLER, Ph.D., Associate Professor of Zoölogy, Davis.
 IVER N. NELSON, Ph.D., Associate Professor of Spanish, Davis.
 LOREN W. NEUBAUER, Ph.D., Associate Professor of Agricultural Engineer-
 ing, Davis.
 HAROLD P. OLMO, Ph.D., Associate Professor of Viticulture, Davis.
 ROY OVERSTREET, Ph.D., Associate Professor of Soil Chemistry.
 EDGAR P. PAINTER, Ph.D., Associate Professor of Chemistry, Davis.
 CHARLES G. PATTEN, Ph.D., Associate Professor of Physics, Davis.
 HAROLD G. REIBER, Ph.D., Associate Professor of Chemistry, Davis.
 CHARLES M. RICK, JR., Ph.D., Associate Professor of Truck Crops, Davis.
 LAUREN E. ROSENBERG, Ph.D., Associate Professor of Zoölogy, Davis.
 FRANCIS L. SMITH, Ph.D., Associate Professor of Agronomy, Davis.
 LESLIE M. SMITH, Ph.D., Associate Professor of Entomology, Davis.
 EDWARD A. STEINHAUS, Ph.D., Associate Professor of Insect Pathology.
 PERRY R. STOUT, Ph.D., Associate Professor of Plant Nutrition.
 NIKITA P. TARASSUK, Ph.D., Associate Professor of Dairy Industry, Davis.
 ROBERT L. USINGER, Ph.D., Associate Professor of Entomology.
 REESE H. VAUGHN, Ph.D., Associate Professor of Food Technology.
 CECIL E. YARWOOD, Ph.D., Associate Professor of Plant Pathology.
 FREDERICK P. ZSCHEILE, JR., Ph.D., Associate Professor of Agronomy, Davis.
 HENRY L. ALDER, Ph.D., Assistant Professor of Mathematics, Davis.
 ROBERT W. ALLARD, Ph.D., Assistant Professor of Agronomy, Davis.
 MERLIN W. ALLEN, Ph.D., Assistant Professor of Entomology.
 LAWRENCE J. ANDREWS, Ph.D., Assistant Professor of Chemistry, Davis.
 HUBERT A. ARNOLD, Ph.D., Assistant Professor of Mathematics, Davis.
 RICHARD E. BAKER, Ph.D., Assistant Professor of Pomology, Davis.
 RICHARD M. BOHART, Ph.D., Assistant Professor of Entomology, Davis.
 ROBERT K. BRINTON, Ph.D., Assistant Professor of Chemistry, Davis.
 DILLON S. BROWN, Ph.D., Assistant Professor of Pomology, Davis.
 SPENCER W. BROWN, Ph.D., Assistant Professor of Genetics.
 ALBERT C. BURDETTE, Ph.D., Assistant Professor of Mathematics, Davis.
 JOHN G. B. CASTOR, Ph.D., Assistant Professor of Viticulture, Davis.
 JULIAN C. CRANE, Ph.D., Assistant Professor of Pomology, Davis.
 PERRY T. CUPPS, Ph.D., Assistant Professor of Animal Husbandry, Davis.
 HERBERT B. CURRIER, Ph.D., Assistant Professor of Botany, Davis.
 PAUL R. DAY, Ph.D., Assistant Professor of Soil Physics.
 EVERETT R. DEMPSTER, Ph.D., Assistant Professor of Genetics.
 JAMES R. DOUGLAS, Ph.D., Assistant Professor of Parasitology, Davis.
 WALTER L. DUNKLEY, Ph.D., Assistant Professor of Dairy Industry, Davis.
 WILLIAM H. ENGLISH, Ph.D., Assistant Professor of Plant Pathology, Davis.
 WALTER D. FISHER, Ph.D., Assistant Professor of Agricultural Economics.
 SOLOMON FISHMAN, Ph.D., Assistant Professor of English, Davis.
 CURTIS M. FULTON, Ph.D., Assistant Professor of Mathematics, Davis.

- DEANE P. FURMAN, Ph.D., Assistant Professor of Parasitology.
HAROLD T. GORDON, Ph.D., Assistant Professor of Entomology.
CHARLES R. GRAU, Ph.D., Assistant Professor of Poultry Husbandry.
WILLIAM H. GRIGGS, Ph.D., Assistant Professor of Pomology, Davis.
BYRON C. GUYER, JR., Ph.D., Assistant Professor of English, Davis.
JAMES F. GUYMON, Ph.D., Assistant Professor of Viticulture, Davis.
CARL J. HANSEN, M.S., Assistant Professor of Pomology, Davis.
JAMES F. HARRINGTON, Ph.D., Assistant Professor of Truck Crops, Davis.
HUDSON T. HARTMANN, Ph.D., Assistant Professor of Pomology, Davis.
CHARLES A. HAYES, JR., Ph.D., Assistant Professor of Mathematics, Davis.
HUBERT HEITMAN, JR., Ph.D., Assistant Professor of Animal Husbandry, Davis.
CLARON O. HESSE, Ph.D., Assistant Professor of Pomology, Davis.
ELIZABETH R. HOMANN, Ph.D., Assistant Professor of English, Davis.
BYRON R. HOUSTON, Ph.D., Assistant Professor of Plant Pathology, Davis.
LOUIS JACOBSON, Ph.D., Assistant Professor of Plant Nutrition.
DONALD E. JASPER, Ph.D., Assistant Professor of Veterinary Medicine, Davis.
DILWORTH D. JENSEN, Ph.D., Assistant Professor of Entomology.
RAYMOND M. KEEFER, Ph.D., Assistant Professor of Chemistry, Davis.
RICHARD E. KEPNER, Ph.D., Assistant Professor of Chemistry, Davis.
PAULDEN F. KNOWLES, Ph.D., Assistant Professor of Agronomy, Davis.
HARRY H. LAIDLAW, JR., Ph.D., Assistant Professor of Entomology, Davis.
HORTON M. LAUDE, Ph.D., Assistant Professor of Agronomy, Davis.
IVAN M. LEE, Ph.D., Assistant Professor of Agricultural Economics.
OSCAR A. LORENZ, Ph.D., Assistant Professor of Truck Crops, Davis.
LOUIS K. MANN, Ph.D., Assistant Professor of Truck Crops, Davis.
WILLIAM H. MATHIEWS, Ph.D., Assistant Professor of Geology, Davis.
ABE E. MICHELbacher, Ph.D., Assistant Professor of Entomology.
WOODROW W. MIDDLEKAUFF, Ph.D., Assistant Professor of Entomology.
LEONARD L. MORRIS, Ph.D., Assistant Professor of Truck Crops, Davis.
GWENDOLYN B. NEEDHAM, Ph.D., Assistant Professor of English, Davis.
CARL B. O'BRIEN, Ph.D., Assistant Professor of History, Davis.
JOHN W. OSWALD, Ph.D., Assistant Professor of Plant Pathology, Davis.
MAURICE L. PETERSON, Ph.D., Assistant Professor of Agronomy, Davis.
HERMAN J. PHAFF, Ph.D., Assistant Professor of Food Technology.
HARLAN K. PRATT, Ph.D., Assistant Professor of Truck Crops, Davis.
ARTHUR E. PRITCHARD, Ph.D., Assistant Professor of Entomology.
SIEGFRIED B. PUKNAT, Ph.D., Assistant Professor of German, Davis.
NOEL P. RALSTON, Ph.D., Assistant Professor of Animal Husbandry, Davis.
ROBERT N. ROYSTON, B.S., Assistant Professor of Landscape Design.
CHARLES W. SCHALLER, Ph.D., Assistant Professor of Agronomy, Davis.
JAMES H. SHIDELER, Ph.D., Assistant Professor of History, Davis.
PAUL G. SMITH, Ph.D., Assistant Professor of Truck Crops, Davis.
RAY F. SMITH, Ph.D., Assistant Professor of Entomology.
ERNEST H. STANFORD, Ph.D., Assistant Professor of Agronomy, Davis.
MORTIMER P. STARR, Ph.D., Assistant Professor of Bacteriology, Davis.
CLIFFORD R. STOCKING, Ph.D., Assistant Professor of Botany, Davis.
PAUL K. STUMPF, Ph.D., Assistant Professor of Plant Nutrition.
SIDNEY S. SUTHERLAND, M.S., Assistant Professor of Education, and Supervisor of Teacher Training in Agriculture, Davis.
EDWARD S. SYLVESTER, Ph.D., Assistant Professor of Entomology.

- WILLIAM N. TAKAHASHI, Ph.D., Assistant Professor of Plant Pathology.
 LINDA VAN NORDEN, Ph.D., Assistant Professor of English, Davis.
 *DAVID H. VOLMAN, Ph.D., Assistant Professor of Chemistry, Davis.
 ALBERT D. WEBB, Ph.D., Assistant Professor of Enology, Davis.
 WILLIAM C. WEIR, Ph.D., Assistant Professor of Animal Husbandry, Davis.
 STEPHEN WILHELM, Ph.D., Assistant Professor of Plant Pathology.
 WILBOR O. WILSON, Ph.D., Assistant Professor of Poultry Husbandry, Davis.
 OSCAR G. BACON, Ph.D., Instructor in Entomology.
 ROBERT J. BOUTHILET, Ph.D., Instructor in Poultry Husbandry.
 ARTHUR L. BROWN, Ph.D., Instructor in Soils, Davis.
 ROBERT B. CASADY, Ph.D., Instructor in Zoölogy, Davis.
 RAYMOND G. GROGAN, Ph.D., Instructor in Plant Pathology, Davis.
 ROBERT M. HAGAN, Ph.D., Instructor in Irrigation, Davis.
 EVERETT W. JAMESON, JR., M.A., Instructor in Zoölogy, Davis.
 KARL R. JOHANSSON, Ph.D., Instructor in Dairy Industry, Davis.
 GLEN P. LOFGREEN, Ph.D., Instructor in Animal Husbandry, Davis.
 JAMES N. LUTHIN, Ph.D., Instructor in Irrigation, Davis.
 JOHN W. MACSWAIN, Ph.D., Instructor in Entomology.
 DUANE S. MIKKELSEN, Ph.D., Instructor in Agronomy, Davis.
 GEORGE NYLAND, Ph.D., Instructor in Plant Pathology, Davis.
 DEWEY J. RASKI, Ph.D., Instructor in Entomology.
 DONALD M. REYNOLDS, Ph.D., Instructor in Bacteriology, Davis.
 WADE C. ROLLINS, Ph.D., Instructor in Animal Husbandry, Davis.
 VERNE H. SCOTT, M.S., Instructor in Irrigation, Davis.
 LESTER L. SKOLLIL, M.A., Instructor in Physics, Davis.
 ARTHUR R. SPURR, Ph.D., Instructor in Truck Crops, Davis.



- EVERETT D. HOWE, M.S., Professor of Mechanical Engineering.
² PAUL S. TAYLOR, Ph.D., Professor of Economics.
 THEODORE VERMEULEN, Ph.D., Associate Professor of Chemical Engineering.
 NORMAN B. AKESSON, M.S., Lecturer in Agricultural Engineering, Davis.
 HERBERT L. BELTON, Associate in Agricultural Engineering, Davis.
 GUY BLACK, B.S., Lecturer in Agricultural Economics.
 ARTHUR D. BORDEN, M.A., Lecturer in Entomology.
 CARL E. BOYER, M.A., Junior Supervisor of Physical Education, Davis.
 ARNOLD BREKKE, B.S., Lecturer in Agricultural Economics, Davis.
 CHARLES W. BURSCH, A.B., Lecturer in Education, Davis.
 NICHOLAS CIRINO, Lecturer in Landscape Design.
 RICHARD L. DOUTT, Ph.D., Lecturer in Biological Control.
 JAMES P. FAIRBANK, B.S., Lecturer in Agricultural Engineering, Davis.
 THEODORE W. FORBES, A.B., Junior Supervisor of Physical Education, Davis.
 JERRY FOYTIK, M.A., Lecturer in Agricultural Economics, Davis.
 NORMAN W. FRAZIER, Ph.D., Lecturer in Entomology.
 VARDEN FULLER, Ph.D., Lecturer in Agricultural Economics.
 ERNEST M. GIFFORD, JR., A.B., Associate in Botany, Davis.
 WARREN J. GROSS, A.B., Associate in Zoölogy, Davis.
 WALDEMAR C. GUNTHER, B.S., Associate in Zoölogy, Davis.
 GORDE C. HANNA, B.S., Lecturer in Truck Crops, Davis.
 S. MILTON HENDERSON, M.S., Lecturer in Agricultural Engineering, Davis.

* Absent on leave, 1949-1950.

² In residence spring semester only. 1949-1950.

- VERNARD B. HICKEY, A.B., Associate Supervisor of Physical Education, Davis.
 MILTON HILDEBRAND, M.A., Lecturer in Zoölogy, Davis.
 CARROLL E. HOWELL, M.S., Associate in Animal Husbandry, Davis.
 BRUCE E. HUBBELL, JR., B.S., Associate in Dairy Industry, Davis.
 ELWOOD M. JUERGENSON, B.S., Lecturer in Education, Davis.
 LOGAN M. JULIAN, D.V.M., Lecturer in Veterinary Medicine, Davis.
 ROBERT A. KEPNER, B.S., Lecturer in Agricultural Engineering, Davis.
 WILLIAM H. LANGE, JR., Ph.D., Lecturer in Entomology, Davis.
 HAROLD D. LEWIS, B.S., Associate in Agricultural Engineering, Davis.
 COBY LORENZEN, JR., M.S., Lecturer in Agricultural Engineering, Davis.
 LAWRENCE E. MCARDELL, A.B., Supervisor of Music, Davis.
 DELBERT G. MCKERCHER, Ph.D., Lecturer in Veterinary Medicine, Davis.
 JAMES C. MARR, A.E., Lecturer in Irrigation, Davis.
 WILBUR W. MAYHEW, A.B., Associate in Zoölogy, Davis.
 RICHARD J. MORRISSEY, M.A., Lecturer in History, Davis.
 RUSSELL T. ROBINSON, B.S., Lecturer in Agricultural Economics, Davis.
 MYRON R. SCHALL, A.B., Assistant Supervisor of Physical Education, Davis.
 EUGENE F. SERR, JR., B.S., Lecturer in Pomology, Davis.
 PATRICIA G. SIKES, M.A., Associate in English, Davis.
 RAYMOND E. STORIE, B.S., Lecturer in Soil Technology.
 LEONORA HOHL STROHMAIER, Ph.D., Lecturer in Food Technology.
 GEORGE A. STROMGREN, A.B., Assistant Supervisor of Physical Education,
 Davis.
 JAMES R. TAVERNETTI, M.S., Lecturer in Agricultural Engineering, Davis.
 IRVING F. TOOMEY, B.S., Supervisor of Physical Education, Davis.
 JOHN M. TUCKER, A.B., Lecturer in Botany, Davis.
 MARYA WELCH, M.A., Assistant Supervisor of Physical Education, Davis.
 WILLIAM O. WILLIAMS, Ph.D., Lecturer in Viticulture, Davis.
 EUGENE S. WILSON, B.S., Associate Supervisor of Physical Education, Davis.

Letters and Science List.—The following courses are included in the Letters and Science List of Courses: Agricultural Economics 100, 112A–112B; Animal Husbandry 101 and 102 (given at Davis); Bacteriology (all courses given at Davis); Biochemistry 101 and 102 (given at Davis); Entomology 1, 106, 112, 117, 126, 127, 129; Forestry 1, 103, 125; all undergraduate courses in genetics except 104; Home Economics 1A–1B, 6, 10, 14, 101A–101B, 111, 112A–112B, 114, 118A–118B, 132, 134, 142, 152, and 160; Plant Pathology 121; Soil Science 110, 111, 112, 113, 114, 115. For regulations governing this list, see page 85.

Upper Division Courses.—All upper division courses announced by this department presuppose at least junior standing in the College of Agriculture. Juniors and seniors in other colleges may elect such courses in the Department of Agriculture as they are qualified to pursue.

Honors.—Students who become candidates for the bachelor's degree in the College of Agriculture may be recommended for honors on the basis of the quality of the work done in the regular curriculum.

Graduate Work.—Concerning conditions for admission to graduate courses see page 163 of this bulletin. Students who intend to become candidates for higher degrees in the Department of Agriculture will be required to give evidence of the completion of an amount of work equivalent, in its value, to that required by the College of Agriculture for the degree of Bachelor of Science. The student is referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, for details of graduate work in the various fields of agriculture.

(GIVEN AT BERKELEY)

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

201A-201B. Research in Agricultural Chemistry. (1-6; 1-6) Yr.

The Staff and members of the Group in Agricultural Chemistry†

The research work will ordinarily be under the direction of a member of the instructing staff who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

An average grade of at least C in all courses undertaken is prerequisite to all upper division courses in agricultural economics.

1. The Agricultural Industry. (3) I. Mr. Voorhies
 Comparison of agriculture with other industries: population, production, improvements, trends, etc. Historical sketch of the development of agriculture. Types of farming and their geographical distribution. Movements of agricultural products. Institutional aids to agriculture.
100. Comparative Agriculture. (3) I. Mr. Voorhies
 Prerequisite: Economics 1A-1B.
 The agriculture of the principal countries of the world, with special reference to the influence of food supply upon the development of man.
- 101A. Principles of Marketing Agricultural Products. (3) I and II.
 Prerequisite: Economics 1A-1B. Mr. Mehren
 Not open to students who have completed Business Administration 123.
 Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products; government in its relation to marketing; consideration of proposals for improvement.
- 101B. Coöperation in Agriculture. (3) II. Mr. Erdman
 Prerequisite: Agricultural Economics 101A or Business Administration 123.
 Farmers' coöperative organizations.
102. Land Economics. (3) I. Mr. Weeks
 Prerequisite: Economics 1A-1B.
 The utilization of agricultural land, economic rent, land appraisal, political and economic problems of land development, land settlement, land policies; the relation of population growth to economic utilization of land and to land value.
104. Agricultural Economics. (3) I and II. Mr. Mehren, Mr. Fuller
 I: Mr. Mehren; II: Mr. Fuller.
 Prerequisite: Economics 1A-1B.
 The application of economic principles to the problems of agriculture.
105. Agricultural Economics Measurements. (3) II. Mr. Lee
 Lectures and laboratory.
 Prerequisite: Economics 2; Mathematics 11A-11B or Mathematics 3A-3B.
 Sources; collection of data; and analysis of selected measurements, including parity prices, parity income, employment, wages, production, and national income.
107. Market Prices. (3) II. Mr. Wellman
 Prerequisite: Agricultural Economics 104, 105.
 Application of economic principles and measurements in the analysis of the behavior of agricultural prices.

† See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

110. Agricultural Finance. (3) II. Mr. Voorhies
Prerequisite: Economics 1A-1B
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
111. Economics of Food Consumption. (3) II. Mr. Fuller
Prerequisite: Economics 1A-1B; Agricultural Economics 101A or Business Administration 160, or Economics 105, or Home Economics 141.
Food requirements in relation to national and international policies on agriculture and trade; economic analysis of programs and proposals designed to improve and stabilize nutrition.
- 112A*-112B. Rural Sociology. (2-2) Yr. Mr. Taylor
Course 112A is prerequisite to 112B.
The forms of human association in rural environment, including their origins, development, structures, functions, and cultural products. Rural population, social organization and institutions, social psychology, ecology patterns, social change, social pathology.
116. Agricultural Policy. (3) II. Mr. Benedict
Prerequisite: Economics 1A-1B.
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
118. Farm Organization. (3) I. Mr. Tinley
Prerequisite: at least one course in agriculture.
The place, purpose, and scope of organization; farm enterprises; selecting farms; planning and equipping; capital needs; earnings.
119. Farm Management. (3) II. Mr. Adams
Prerequisite: Agricultural Economics 118.
Methods of handling properties; duties and qualifications of managers; bookkeeping and accounting; marketing methods; farm labor; tenancy; farm law.
122. Coöperative Management. (3) I. Mr. Tinley
Prerequisite: Agricultural Economics 101A-101B and Business Administration 1A.
Analysis of organizational and operational problems and policies of agricultural coöperative associations.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Voorhies in charge)
Prerequisite: senior standing and approval of the Division. Limited to agricultural economics majors.
- GRADUATE COURSES
202. Seminar in Agricultural Policy. (2) II. Mr. Wellman
A study of public and semipublic activities pertaining to agriculture as an industry.
203. Research in Agricultural Economics. (1-6) I and II.
The Staff (Mr. Wellman in charge)
- 204A-204B. Analytical Methods in Agricultural Economics. (3-3) Yr.
Mr. Kuznets, Mr. Fisher, Mr. Lee
204A: Mr. Kuznets, Mr. Fisher; 204B: Mr. Kuznets, Mr. Lee.
Evaluation and treatment of economic data in agriculture, with emphasis on methods of analyzing relations between two or more variables.
205. Seminar in the Marketing of Agricultural Products. (2) II. Mr. Mehren
An analysis of the economic effects of state and federal activity in the marketing of agricultural products.

* Not to be given, 1949-1950.

- 206A. Economics of Agricultural Production. (3) I. Mr. Hoos
A detailed study of the basic principles of the economics of production.
- 206B. Economics of Agricultural Production. (3) II. Mr. Benedict
The application of economic principles to problems of production adjustment.
207. Advanced Land Economics. (2) I. Mr. Weeks
Land policies, planning, rent, tenure appraisal, development, and utilization.
208. Seminar in the Conservation of Natural Resources. (2) II. Mr. Wantrup
The economic and social aspects of the conservation of natural resources in the United States and foreign countries, with particular reference to agriculture.
209. Seminar in Agricultural Market Organization. (3) I. Mr. Erdman
An analysis of the economic factors influencing organization and operating efficiency, price and sales policies, and the financial structure of different marketing organizations.
212. Seminar in Farm Management. (2) II. Mr. Adams, Mr. Tinley
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.
299. Special Study for Graduate Students. (1-4) I and II.
The Staff (Mr. Wellman in charge)
Any properly qualified graduate student may investigate a special field of study if his proposed program is acceptable to the member of the staff with whom he works.

AGRICULTURAL ENGINEERING

12. Survey and Problems in Agricultural Engineering. (2) II. Mr. Walker, Mr. Bainer
The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

AGRONOMY

- *1. Introduction to Agronomy. (3) I. Mr. Briggs
Principles underlying the distribution and culture of field crops, with emphasis upon seed selection, maintenance of soil fertility, and the theory and practice of dry farming. The production of typical cereal, forage, fiber, and root crops is briefly discussed.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Briggs in charge)
Prerequisite: 6 units of upper division agronomy.

GRADUATE COURSE

- 200A-200B. Research in Agronomy. (1-6; 1-6) Yr.
Mr. Briggs, Mr. Love, Mr. Laude

ANIMAL HUSBANDRY

7. Introduction to Animal Husbandry. (3) II. The Staff (Mr. Hughes in charge)
A survey of the sources of the world's supply of animal products; the distribution of domestic animals in the United States; the origin, characteristics, and adaptations of the more important breeds and the influence of environment upon their development.

* Not to be given, 1949-1950.

ENTOMOLOGY AND PARASITOLOGY

1. General Entomology. (4) I. Mr. Freeborn
Lectures and laboratory.
The classification, life history, structure, and physiology of insects.
49. Summer Practice and Observation Course. (No credit)
Six weeks. Daily, except Sunday. The Staff (Mr. Essig in charge)
Required of all students with a major in entomology or parasitology.
106. Insect Morphology and Histology. (4) II. Mr. Craig
Lectures and laboratory.
Prerequisite: Entomology 1.
Comparative insect anatomy; histological techniques.
110. Insect Physiology. (3) I. Mr. Craig
Lectures and laboratory.
The general principles of insect physiology with experimental studies
on nutrition, digestion, excretion, circulation, respiration, and the nervous
and hormonal systems.
112. Systematic Entomology. (4) I. Mr. Linsley
Lecture and laboratory.
Prerequisite: Entomology 1 or consent of the instructor.
The classification of insects, taxonomic categories and procedure; bib-
liographical methods; nomenclature; museum practices.
114. Forest Entomology. (3) I. Mr. Linsley
Lectures and laboratory.
Insects affecting forest, shade, and ornamental trees.
117. Helminthology. (4) I. Mr. Stewart
Lectures and laboratory.
Helminthic infections of man and domestic animals. The biology, pro-
phylaxis, and treatment of the various parasites are dealt with in detail.
Laboratory exercises are devoted to the taxonomy and identification of
parasites and to diagnostic laboratory methods.
118. Plant Nematology. (4) II. Mr. Allen
Lectures and laboratory.
Identification, morphology, biology, and distribution of plant parasitic
and associated nematodes. Symptomatology, pathology, and control of
nemic infections in cultivated crops. Techniques employed in the manipula-
tion and examination of soil and infected plants.
124. Economic Entomology. (4) II. Mr. Essig
Lectures and laboratory.
Life histories, habits, distribution, economics, and control of insects
attacking agricultural crops and stored products.
125. Insect Vectors of Plant Diseases. (4) I. Mr. Freitag, Mr. Sylvester
Lectures and laboratory.
The role of insects in the transmission and causation of plant virus dis-
eases. Greenhouse insect-rearing and virus-transmission experiments.
126. Medical Entomology. (4) II. Mr. Stewart
Lectures and laboratory.
The role of insects and other arthropods in transmission and causation
of diseases of humans and domesticated animals.
127. Insect Ecology. (3) II. Mr. Craig, Mr. Usinger
Principles of ecology; animal communities; insect behavior.
128. Insect Toxicology. (4) I. Mr. Hoskins, Mr. Gordon
Lectures and laboratory.
Chemical composition and reactions of insecticides and fungicides, and
their physiological effects on plant and animal tissues.

129. Biological Control of Insect and Weed Pests. (3) I. Mr. H. S. Smith
Lectures and laboratory.
Prerequisite: upper division standing.
Principles and methods of biological control; biology of entomophagous insects; critical discussion of important projects of world-wide scope.
130. Agricultural Entomology. (3) II. Mr. Borden
Lectures and laboratory (field trip).
Prerequisite: Entomology 124.
An advanced course in the principles and practices of experimental field entomology.
131. Insect Pathology. (4) II. Mr. Steinhaus
Lectures and laboratory.
Prerequisite: Entomology 1 and at least one course in microbiological sciences (mycology, bacteriology, or protozoölogy).
General insect pathology and microbiology, including biological relationships between microorganisms and insects. Detailed study of bacterial, fungous, virus, and protozoan diseases of insects; noninfectious diseases; histopathology; microbial agents and biological control.
132. History of Entomology. (3) II. Mr. Essig, Mr. Linsley
Prerequisite: Entomology 1 and one additional course in entomology.
Outline of the development of world entomology.
133. Biology of Aquatic and Littoral Insects. (4) II. Mr. Usinger
Lectures and laboratory.
Habits and ecology of aquatic and semiaquatic insects with emphasis on their relations to problems of wildlife management. It is expected that this course will satisfy the entomological requirements for students of the Wildlife Curriculum in the College of Letters and Science.
135. Insects in Relation to Flowering and Other Ornamental Plants. (3) I. Mr. Pritchard
Lectures and laboratory.
Prerequisite: Entomology 124.
The study of the importance, recognition, taxonomy, biology, ecology, and control of insects and related pests of flowering and other ornamental plants.
136. Insects and Their Relation to Commercial Vegetables and Field Crops. (4) II. Mr. Michelbacher, Mr. Middlekauff, Mr. R. F. Smith
Lectures and laboratory; one or more field trips.
Prerequisite: Entomology 124.
The major insects and related organisms attacking commercial vegetable and field crops in California; their biology, ecology, distribution, diagnosis, and cultural and chemical control.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Essig in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Systematic and Economic Entomology, Insect-borne Plant Diseases, and Biological Control. (1-1) Yr.
The Staff (Mr. Essig in charge)
- 201A-201B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
The Staff (Mr. Essig in charge)
- 202A-202B. Seminar in Medical Entomology and Parasitology. (1-1) Yr.
Mr. Stewart, Mr. Furman
- 203A-203B. Seminar in Insect Toxicology and Insect Physiology. (1-1) Yr.
Mr. Craig, Mr. Hoskins, Mr. Gordon
- 204A-204B. Seminar in Insect Pathology. (1-1) Yr. Mr. Steinhaus

FOOD TECHNOLOGY

112. Principles and Practices of Food Processing. (3) I. Mr. Cruess
(Formerly numbered 112A.)
Prerequisite: Chemistry 1A-1B; Bacteriology 1.
Principles and technological processes involved in the preparation, preservation, and examination of fruit and vegetable products.
113. Chemical and Biochemical Aspects of Food Processing. (3) II. Mr. Mrak, Mr. Phaff
(Formerly numbered 112B.)
Prerequisite: Chemistry 1A-1B, 8; Bacteriology 1.
Relation of food processing and handling to acceptability, color changes, enzyme activity, deterioration, flavor, vitamin retention, and other factors.
114. Principles of Food Processing Operations. (4) I. Mr. Marsh
(Formerly numbered 115A.)
Lectures and laboratory.
Prerequisite: Chemistry 1A-1B, 5, 8; Bacteriology 1.
Technical principles relating to processing operations used in the commercial preservation of fruits, vegetables, and other foods; theory and practical applications, including field trips.
115. Food Analysis. (4) II. Mr. Joslyn
(Formerly numbered 115B.)
Lectures and laboratory.
Prerequisite: Chemistry 1A-1B, 5, 8. Recommended: Bacteriology 1.
Application of quantitative physical and chemical methods of analysis to examination of commercial fruit and vegetable products; laboratory control and research; methods of analysis as applied to food processing; interpretation of results in relation to manufacturing methods and commercial standards.
116. Yeasts and Related Organisms. (4) II. Mr. Mrak, Mr. Phaff
Lectures and laboratory.
Prerequisite: Chemistry 1A-1B, 8; Botany 1 or 12; Bacteriology 1.
Morphology, development, classification and distribution of yeasts; relation to other fungi, growth requirements; physiological activities, including certain industrial aspects.
117. Food Microbiology. (4) I. Mr. Vaughn
Lectures and laboratory.
Prerequisite: Food Technology 114. Recommended but not required: Bacteriology 105 and Food Technology 116.
Characteristics, activity, and control of beneficial and spoilage organisms in the canning, dehydration, fermentation, freezing, pickling, preserving, and other food industries.
120. The Natural Coloring Matters. (3) II. Mr. Mackinney
Lectures and laboratory.
Prerequisite: three units of biochemistry or plant biochemistry, or upper division organic chemistry.
Chemistry of natural pigments and related compounds; spectrophotometric and chromatographic techniques; special emphasis on pigments in relation to foods.
127. Recent Advances in Food Technology. (1) I and II.
The Staff (Mr. Vaughn in charge fall semester,
Mr. Mrak in charge spring semester)
(Formerly numbered 127A-127B.)
May be repeated once for credit.
Prerequisite: two courses in food technology or the equivalent.
Assigned topics, reports, and discussions concerning recent advances in food technology.

140. Unit Operations in Food Industries. (2) II. Mr. Joslyn, Mr. Vermeulen
Prerequisite: Chemistry 8, 109; Bacteriology 1.
Introduction to selection and operation of processing methods and machinery, and economics of plant location, with particular emphasis on the more important unit operations of food processing.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Mrak in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Food Technology. (1-1) Yr.
The Staff (Mr. Mackinney in charge fall semester,
Mr. Phaff in charge spring semester)
- 237A-237B. Research in Food Technology. (1-9; 1-9) Yr.
The Staff (Mr. Mrak in charge)

FORESTRY

(For courses in Forestry, see page 305)

GENETICS

100. Principles of Genetics. (4) I. Mr. Dempster
Lectures and laboratory.
Prerequisite: general botany (Botany 1, 12, or equivalent). Recommended: general zoölogy (Zoölogy 1A or equivalent).
Introduction to genetics with some consideration of its applications in agriculture, biology, and human welfare.
101. Cytogenetics. (3) II. Mr. Clausen
Prerequisite: Genetics 100 and general cytology.
Genetics as related to cytological conditions, with particular reference to plant materials. Course 101C may be taken concurrently.
- 101C. Cytogenetics Laboratory. (2) II. Mr. S. W. Brown, Mr. Stebbins
Prerequisite: Genetics 101 (may be taken concurrently).
Laboratory study of chromosome morphology and behavior as related to problems in genetics.
102. Advanced Genetics. (3) I. Mr. Jenkins
Lectures and laboratory.
Prerequisite: Genetics 100.
With special reference to methods. Intended to supplement Genetics 100 for students whose major is genetics.
103. Organic Evolution. (3) II. Mr. Stebbins
Prerequisite: Genetics 100 or equivalent.
The principles of evolution with particular reference to the evolutionary processes in plants.
104. Nature and Functions of Hereditary Materials. (3) I. Mr. S. W. Brown
Prerequisite: Genetics 100 and Chemistry 8, or their equivalents. Recommended: general cytology.
An introduction to modern concepts in biochemical and physiological genetics and their applications in related fields.
105. Population Genetics. (3) II. Mr. Lerner, Mr. Dempster
Prerequisite: Elementary genetics and statistics, including analysis of variance. Recommended: Genetics 102.
A study of the genetic forces operating in artificial selection. Discussion and formulation of breeding plans on the basis of the principles of population genetics with special reference to animals.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Clausen in charge)

GRADUATE COURSES

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr.
The Staff (Mr. Clausen in charge)
- 201A-201B. Staff Seminar in Genetics. (No credit) Yr.
The Staff (Mr. Clausen in charge)
Weekly meeting for the presentation of special topics by members of the staff, visiting investigators, and graduate students.
- 202A-202B. Graduate Seminar in Genetics. (1-4; 1-4) Yr.
The Staff (Mr. Clausen in charge)
Prerequisite: graduate standing in genetics.
Intensive study of special topics in genetics, under supervision of members of the staff.

HOME ECONOMICS

(For courses in Home Economics, see page 329)

HORTICULTURE

2. Fruit Growing. (3) I. Mr. Griggs
Prerequisite: Botany 1 or 12.
Fruit growing practices; propagation, planting, and culture of orchard trees, and small fruits.

LANDSCAPE DESIGN

- 1A-1B. Elementary Design and Theory. (3-3) Yr.
Lectures and laboratory. Mr. Royston, Mr. Vaughan
Prerequisite: Architecture 1 or equivalent, and consent of the instructor.
The analysis and solution of typical site problems.
2. History and Literature of Landscape Design. (2) I. Mr. Vaughan
Study and analysis of landscape design through the ages with emphasis on its relation to climate, topography, and society in various times and localities.
Limited to major students in landscape design.
49. Summer Travel and Observation Course. (No credit)
The Staff (Mr. Vaughan in charge)
Six weeks of field trips, study, and analysis of outstanding works in site planning and landscape design throughout Central California.
Limited to major students in landscape design.

UPPER DIVISION COURSES

- Art 2A-2B or Decorative Art 16A-16B, Botany 1 or 12, Architecture 1 and 2, Engineering 21, Landscape Design 1A-1B and 2 are prerequisite to all upper division courses in landscape design.
- 101A-101B. Intermediate Design and Theory. (3-3) Yr.
Lecture and laboratory. Mr. Vaughan, Mr. Royston
Specific problems in the design of residential homesites, parks, and general public areas.
- 111A-111B. Landscape Design and Construction. (4-4) Yr. Mr. Cirino
Lecture, laboratory, and field trips.
Problems of design and construction with special reference to grading, retaining walls, steps, pools, garden structures, fences, irrigation and drainage systems; reports and estimates.
- 112A-112B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
Lecture, laboratory, and field trips.
The form, habit, texture, and adaptation of coniferous, deciduous, and evergreen shrubs, broadleaf and coniferous trees.

- 113A-113B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
Lecture, laboratory, and field trips.
The form, habit, and adaptation of alpiners, succulents, palms, tropical plants, natives, vines, and deciduous trees.
- 114A-114B. Advanced Design and Theory. (4-4) Yr.
Lecture and laboratory. Mr. Royston, Mr. Vaughan
Prerequisite: Landscape Design 101A-101B.
Specific problems of design and construction in large areas.
- 115A-115B. City and Town Planning. (4-4) Yr. Mr. Vaughan, Mr. Royston
Lecture and laboratory.
Specific problems in design of public-use areas.
116. Site Planning. (4) II. Mr. Royston
Lecture, laboratory, and field trips.
Prerequisite: junior standing in architecture or landscape design, and consent of the instructor.
A study of the development of irregular topography for building groups and their attendant outdoor elements.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Vaughan in charge)

GRADUATE COURSE

- 201A-201B. Graduate Design and Theory. (1-6; 1-6) Yr.
The Staff (Mr. Vaughan in charge)
Advanced problems and research.

PLANT NUTRITION

GRADUATE COURSES

(For undergraduate courses in Plant Nutrition, see Soil Science)

- 201A-201B. Research. (1-9; 1-9) Yr.
Mr. Arnon, Mr. Barker, Mr. Bennett, Mr. Hassid,
Mr. Jacobson, Mr. Stout, Mr. Stumpf
Prerequisite: qualified graduate students, with consent of the instructor.
Research on problems of plant nutrition and plant biochemistry.
202. Seminar in Carbohydrate Chemistry. (1) II. Mr. Hassid
Prerequisite: consent of the instructor.
Seminar in advanced carbohydrate chemistry, with special reference to plant science.
- 203A-203B. Seminar in Plant Biochemistry. (1-1) Yr.
Mr. Barker, Mr. Hassid, Mr. Stumpf
Prerequisite: qualified graduate students, with consent of the instructor.
Seminar on problems of plant nutrition and plant biochemistry.
- 235A-235B. Staff Seminar in Plant Nutrition. (No credit) Yr.
The Staff (Mr. Arnon in charge)

PLANT PATHOLOGY

100. Forest Pathology. (3) II. Mr. Hansen
Lectures and laboratory.
Prerequisite: Botany 1 or 12 and 16. Restricted to forestry students.
Diseases of forest plants.
120. Plant Diseases. (4) I. Mr. Yarwood
Lectures and laboratory.
Prerequisite: Botany 1 or 12 and 16, and Bacteriology 1.
A general course on the nature, cause, and control of plant diseases.

121. Technique of Plant Pathology. (2) II.
 Laboratory. Mr. Rawlins, Mr. Ark, Mr. Takahashi
 Prerequisite: Plant Pathology 120.
 (A) Histology and phytopathological technique. (B) Application of histochemical methods to the study of diseased plant tissues.
 May be repeated once without duplication of credit (maximum, 4 units).
 Part (A) to be given in 1949-1950.
123. Principles of Plant Pathology. (2) II. Mr. Thomas, Mr. Wilhelm
 Prerequisite: Plant Pathology 120.
 A consideration of some of the principles broadly applicable to fungus, bacterial, virus, and nutritional diseases of plants.
- *125. Diseases of Truck and Field Crops. (2) I. Mr. Gardner, Mr. Snyder
 Laboratory.
 Prerequisite: Plant Pathology 120.
 The pathology of important crop plants. Dissemination, factors influencing inception and severity of disease, diagnosis, host reaction, etiology, control.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Gardner, Mr. Snyder, Mr. Hansen, Mr. Rawlins,
 Mr. Thomas, Mr. Ark, Mr. Yarwood, Mr. Wilhelm

GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
 The Staff (Mr. Thomas in charge)
- 230A-230B. Research in Plant Pathology. (1-9; 1-9) Yr.
 Mr. Gardner, Mr. Hansen, Mr. Rawlins, Mr. Snyder, Mr. Takahashi,
 Mr. Thomas, Mr. Ark, Mr. Yarwood, Mr. Wilhelm

POMOLOGY

(For courses in Pomology, see Horticulture)

POULTRY HUSBANDRY

1. Poultry Production. (3) I. Mr. Grau
 Lectures and laboratory.
 An introductory study of the relation of the several sciences underlying poultry production to flock management.
102. Experimental Incubation. (3) II. Mr. L. W. Taylor
 Lectures and laboratory.
 Prerequisite: Zoölogy 100, Chemistry 8.
 Problems of embryonic development, causes of embryonic mortality in poultry, and principles of artificial incubation.
103. Poultry Breeding. (3) I. Mr. L. W. Taylor, Mr. Lerner
 Prerequisite: Genetics 100.
 Inheritance of characteristics in poultry and study of the application of genetic principles to problems in poultry breeding.
104. Poultry Feeds and Feeding. (3) I. Mr. Lepkovsky
 Lectures and laboratory.
 Prerequisite: Poultry Husbandry 106, completed or in progress.
 A study of the manufacture, composition, and use of poultry feedstuffs; elementary feed analysis.
106. Principles of Animal Nutrition. (3) I. Mr. Lepkovsky
 Prerequisite: Chemistry 8, Zoölogy 1B; Physiology 1 and 1L or Animal Husbandry 110.
 Not open to students who have had Animal Husbandry 101 at Davis.
 The fundamentals of metabolism, maintenance, growth, and reproduction.

* Not to be given, 1949-1950.

tion; chemistry and digestion of the proteins, carbohydrates, and fats; functions of minerals, vitamins, and water.

This course may be elected in the Animal Science Curriculum on the Berkeley campus to meet biochemistry requirements.

Poultry Hygiene. (See Veterinary Science 101.)

Poultry Farm Finance. (See Agricultural Economics 110.)

Poultry Farm Organization and Administration. (See Agricultural Economics 118 and 119.)

Marketing Poultry Products. (See Agricultural Economics 101A, 101B, 104, and 199.)

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. L. W. Taylor in charge)

Prerequisite: Poultry Husbandry 1, courses basic to the problems elected, and consent of the instructor.

Problems relating to the nutrition, breeding, incubation, physiology, or egg and meat quality of chickens may be elected.

GRADUATE COURSE

200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.

Mr. L. W. Taylor, Mr. Bouthilet, Mr. Grau, Mr. Lepkovsky, Mr. Lerner

SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained an average grade of at least C in each of the fields of required courses in chemistry, physics, botany, bacteriology, and the geological sciences.

Soil Morphology and Soil Physics

100. Soil Characteristics. (4) I. Mr. Bodman, Mr. Day

Lectures and laboratory.

Prerequisite: Chemistry 1A-1B, Physics 2A-2B, Geology 1.

An introduction to the physical and chemical properties of the soil.

101. Development and Morphology of Soils. (3) II. Mr. Jenny

Prerequisite: Geology 1, Chemistry 1A-1B. Recommended: Soil Science 100.

Influence of climate, vegetation, parent material, topography, and time on soil development; chemistry of soil formation; classification of soils; relationships between soil groups and agricultural use; developed and illustrated by a critical study of representative soils of the world.

102. Soil Physics. (2) II. Mr. Bodman

Prerequisite: Soil Science 100, including laboratory; calculus (Mathematics 3A-3B or 11A-11B). Recommended: physical chemistry. Soil Science 102L should be taken concurrently.

The physical properties of soils and their measurement.

102L. Soil Physics. (2) II. Mr. Day, Mr. Bodman

Laboratory.

Prerequisite: Soil Science 102 (may be taken concurrently).

Laboratory experiments designed to accompany Soil Science 102.

103. Soils of California. (3) I. Mr. Storie

Lectures and discussion section. Two field trips during the semester to be arranged.

Prerequisite: Geology 1, Chemistry 1A-1B.

The general character, mode of formation, classification, geography, use and conservation of the soil resources of the State. Practice in identifying, rating, and judging the probable agricultural value of the important soils in California.

105. Summer Field Course. (6) Mr. Storie
Six weeks, daily.
Prerequisite: Soil Science 100 and 101 or 103, and approval of instructor in charge.
Methods of mapping and classifying soils; the preparation of soil reports; field work in soil surveying and field studies of the profiles of representative California soils.
- Soil Chemistry, Soil Microbiology, and Plant Nutrition**
110. The Soil as a Medium for Plant Growth. (4) I. Mr. Stout, Mr. Overstreet
Lectures and one other hour to be arranged.
Prerequisite: Chemistry 1A-1B, 8. Recommended: Geology 1.
Composition and properties of soils; factors determining productivity; the causes and effects of the soil's reaction, with particular reference to "acid" and "alkali" soils; the nature of fertilizers and some of their effects upon soil and plant; current theory of the soil solution.
111. Soil Microbiology. (2) II. Mr. Barker
Prerequisite: Chemistry 5, 8, Bacteriology 1 or 2.
The role of microorganisms in nature, particularly in relation to agriculture.
112. Soil Chemistry in Relation to Plant Growth. (2) II.
Mr. Stout, Mr. Overstreet
Prerequisite: Soil Science 110 and Chemistry 5.
Soil conditions as phenomena and in relation to factors influencing fertility; liquid and solid phases of the soil, including absorption phenomena, base exchange, and buffer effects.
113. Soil Chemistry in Relation to Plant Growth. (2) II.
Laboratory. Mr. Overstreet, Mr. Stout
Prerequisite: Chemistry 5, Soil Science 112 (to be taken concurrently).
114. Properties of Colloids. (3) II. Mr. Jenny
Prerequisite: a course in physical chemistry.
Properties of colloidal systems of importance in agriculture and biology. Chemistry and physics of surfaces (adsorption, ion interchange), electric double layer, flocculation, Brownian movement, colloid optics, viscosity, swelling.
115. Mineral Nutrition of Plants. (2) II. Mr. Arnon
Prerequisite: Botany 111.
Designed for students in soil science and certain other curricula in agriculture and for students in botany.
Nutrient medium in relation to inorganic and organic composition of plants; nitrogen metabolism; deficiency diseases; effects of inorganic elements on physiological processes; toxicities of mineral elements; certain relations between plant and animal nutrition; special phases of absorption and accumulation of mineral elements, including methods of experimentation.
116. Soil Management. (2) I. Mr. Bodman in charge
Prerequisite: senior standing in soil science.
Evaluation of soil fertility by field experiments; use of fertilizers; cultivation practices; aspects of soil erosion control. Lectures, discussions, and demonstrations by various specialists.

RELATED COURSES IN OTHER DEPARTMENTS

Plant Biochemistry (Botany 122, 123).

General Soil Science

199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Bodman, Mr. Arnon, Mr. Barker, Mr. Day, Mr. L. E. Davis,
 Mr. Jenny, Mr. Overstreet, Mr. Storie, Mr. Stout
 Open only to students with an average grade of at least B, and subject
 to the approval of the undergraduate adviser in soil science.

GRADUATE COURSES

- 201A-201B. Research in Soil Science. (1-9; 1-9) Yr.
 Mr. Arnon, Mr. Barker, Mr. Bodman, Mr. L. E. Davis,
 Mr. Jenny, Mr. Overstreet, Mr. Stout, Mr. Day
235. Seminar. (1) I. Mr. Jenny
 Prerequisite: graduate standing in soil science, plant physiology, or
 related subjects.
- 236A-236B. Staff Seminar in Soil Science. (No credit) The Staff

SUBTROPICAL HORTICULTURE

For announcement of courses in this field, see the PROSPECTUS OF THE COLLEGE
 OF AGRICULTURE or the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES.

TRUCK CROPS

- *1. Vegetable Production. (3) II. Mr. MacGillivray
 Principles involved in vegetable production; survey of the vegetable
 industry.

VETERINARY SCIENCE

(See page 456)

(GIVEN AT DAVIS)

AGRICULTURAL CHEMISTRY**GRADUATE COURSES**

- *200A-200B. Seminar in Agricultural Chemistry. (1-1) Yr.
 The Staff (Mr. Young in charge)
- 201A-201B. Research in Agricultural Chemistry. (1-6; 1-6) Yr.
 The Staff (Mr. Reiber in charge)

AGRICULTURAL ECONOMICS

2. Agricultural Coöperatives. (3) II. Mr. Robinson
49. Field Practice. (1-6) I and II. The Staff (Mr. Mehren in charge)
- 101A. Principles of Marketing Agricultural Products. (3) II. Mr. Mehren
103. Agriculture in the American Economy. (3) II. Mr. Brekke
118. Farm Organization. (3) I. Mr. Hedges
119. Farm Management. (3) II. Mr. Tinley
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Mehren in charge)

AGRICULTURAL ENGINEERING

12. Survey and Problems in Agricultural Engineering. (2) II.
 Mr. Walker, Mr. Bainer
- 14A-14B. Farm Mechanics for Teachers. (2-2) Yr.
 Mr. Fairbank, Mr. Lewis, Mr. Belton
49. Summer Field Practice. (6) The Staff (Mr. Perry in charge)
102. Unit Operations in Processing Agricultural Products. (3) II.
 Mr. Perry, Mr. Henderson

* Not to be given, 1949-1950.

103. Agricultural Power. (3) II. Mr. Moses, Mr. Lorenzen
 104. Agricultural Machinery. (3) I. Mr. Bainer, Mr. R. A. Kepner
 105. Farm Structures. (3) I. Mr. Neubauer
 106. Heat Transfer in Agricultural Climatic Environment. (2) II. Mr. Brooks
 †113. Agricultural Power. (4) II. Mr. Moses, Mr. Lorenzen
 †114. Agricultural Machinery. (3) I. Mr. Bainer, Mr. R. A. Kepner
 †115. Farm Structures Design. (3) I. Mr. Neubauer
 †130. Proseminar. (1) II. Mr. F. A. Brooks, Mr. Walker
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Bainer in charge)

GRADUATE COURSE

- 200A-200B. Research in Agricultural Engineering. (1-6; 1-6) Yr.
 Mr. Bainer, Mr. Akesson, Mr. Boelter, Mr. F. A. Brooks, Mr. Fairbank,
 Mr. Henderson, Mr. Howe, Mr. R. A. Kepner, Mr. Moses, Mr. Neu-
 bauer, Mr. Perry, Mr. Veihmeyer, Mr. Walker, Mr. Young

AGRONOMY

1. Introduction to Agronomy. (3) I. Mr. Allard
 110. Principles of Crop Production. (3) I. Mr. Laude
 111. Field Crops. (3) I. Mr. Stanford
 112. Forage Crops. (3) II. Mr. Peterson
 114. Plant Breeding. (3) II. Mr. Briggs
 115. Range Plants and Management. (3) II. Mr. Love
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Briggs in charge)

GRADUATE COURSE

- 200A-200B. Research in Agronomy. (1-6; 1-6) Yr.
 Mr. Briggs, Mr. Allard, Mr. Conrad, Mr. Knowles, Mr. Laude, Mr.
 Love, Mr. Madson, Mr. Peterson, Mr. Schaller, Mr. F. L. Smith,
 Mr. Stanford, Mr. Zscheile

ANIMAL HUSBANDRY

7. Introduction to Animal Husbandry. (3) I. Mr. Heitman
 8. Livestock Judging and Selection. (1) I. Mr. Heitman, Mr. Weir, Mr. Lofgreen
 101. Animal Biochemistry. (3) II. Mr. Goss
 102. Animal Biochemistry Laboratory. (2) I and II. Mr. Goss, Mr. Lofgreen
 103. Animal Nutrition—Feeds and Feeding. (3) I. Mr. Miller, Mr. Weir
 107. Breeding Farm Animals. (2) II. Mr. Cupps
 108. Milk Production. (4) II. Mr. Regan, Mr. Ralston
 110. Physiology of Domestic Animals. (5) I. Mr. H. H. Cole
 111. Advanced Livestock Judging. (2) I. Mr. Hughes, Mr. Weir
 112. Advanced Dairy Cattle Production. (2) I. Mr. Mead, Mr. Regan, Mr. Ralston
 113. Wool Technology. (3) I. Mr. J. F. Wilson
 115. Horse Production. (3) II. Mr. Howell, Mr. Cupps

† Designed for students in the College of Engineering who are majoring in agricultural engineering; not open to College of Agriculture students.

118. Meat Production. (4) II. Mr. Guilbert, Mr. Heitman, Mr. R. F. Miller
 120. Advanced Animal Nutrition. (3) I. Mr. Kleiber
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Hughes in charge)

GRADUATE COURSES

- 200A-200B. Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics. (1-6; 1-6) Yr.
 Mr. Hughes, Mr. H. H. Cole, Mr. Cupps, Mr. Goss, Mr. Gregory, Mr. Guilbert, Mr. Heitman, Mr. Howell, Mr. Kleiber, Mr. Lofgreen, Mr. Mead, Mr. R. F. Miller, Mr. Ralston, Mr. Regan, Mr. Rollins, Mr. Storer, Mr. Weir, Mr. J. F. Wilson, Mr. Young
 201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr. The Staff (Mr. Hughes in charge)

BACTERIOLOGY

1. Introductory Bacteriology and Microbiology. (5) II. Mr. Starr, Mr. Reynolds
 2. General Bacteriology. (4) I. Mr. Mudge
 103. Microbial Metabolism. (2) II. Mr. Starr
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Mudge in charge)

GRADUATE COURSES

200. Research in Bacteriology. (1-6) I and II.
 The Staff (Mr. Mudge in charge)
 201A-201B. Seminar in Bacteriology and Microbiology. (1-1) Yr.
 The Staff (Mr. Mudge in charge)

BOTANY

1. General Botany. (5) I and II.
 Mr. Robbins, Mr. Weier, Mr. Currier, Mr. Stocking, Mr. Tucker
 2. Plant Morphology. (4) II. _____
 (Formerly numbered 5.)
 7. Introduction to Plant Physiology. (4) II. Mr. Stocking
 8. Poisonous Plants. (2) II. Mr. Robbins
 105. Plant Anatomy. (4) I. Miss Esau
 106. Morphology of Flowering Plants. (3) II. Miss Esau
 107. Weed Control. (4) II. Mr. Crafts, Mr. Robbins
 108. Systematic Botany of Seed Plants. (3) II. Mr. Tucker
 120A-120B. Plant Physiology. (2-2) Yr. Mr. Currier
 121A-121B. Plant Physiology Laboratory. (2-2) Yr.
 Mr. Crafts, Mr. Currier
 130. Plant Cytology. (4) I. Mr. Weier
 131. Chromosome Techniques. (2) II. Mr. Weier
 155. Microscopic Technique. (2) I. Miss Esau
 (Formerly numbered 100D.)
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Robbins in charge)

GRADUATE COURSES

- 200A-200B. Research in Botany. (1-6; 1-6) Yr.
The Staff (Mr. Robbins in charge)
203. Seminar in Plant Physiology. (1) I and II.
Mr. Crafts, Mr. Currier, Mr. Stocking
208. Seminar in Cytology. (1) II. Mr. Weier

BUSINESS ADMINISTRATION

- 1A. Principles of Accounting. (3) I. Mr. Foytik

CHEMISTRY

- 1A-1B. General Chemistry. (5-5) Yr. Beginning either semester.
Mr. Young, Mr. Andrews, Mr. Brinton, Mr. Keefer, Mr. R. E. Kepner,
Mr. Painter, Mr. Reiber, Mr. Volman
5. Quantitative Analysis. (3) II. Mr. Keefer
8. Short Survey of Organic Chemistry. (3) I and II. Mr. Reiber
9. Methods of Organic Chemistry. (3) I. Mr. R. E. Kepner
- 12A-12B. General Organic Chemistry. (5-5) Yr. Mr. Andrews
101. General Biochemistry. (3) II. Mr. Painter
102. Biochemistry Laboratory. (2) II. Mr. Painter
109. Physical Chemistry, Brief Course. (3) II. Mr. Young
- *111. Physical Chemistry. (3) I. Mr. Keefer
- *113. Chemistry of Colloids. (3) I. Mr. Volman
- 114H. Physical Chemistry—Thermodynamics. (3) I. Mr. Young
(Formerly numbered 114.)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Young in charge)

GRADUATE COURSE

280. Research. (2-9) I and II. The Staff (Mr. Young in charge)

DAIRY INDUSTRY

1. Principles of Dairying. (3) I. Mr. Jack, Mr. Ralston
2. Laboratory in Principles of Dairying. (1) I. Mr. Tarassuk
49. Summer Practice and Observation Course. (6)
The Staff (Mr. Hubbell in charge)
- 101A-101B. Dairy Products. (5-5) Yr.
Mr. Roadhouse, Mr. Jack, Mr. Phillips, Mr. Dunkley
I: Mr. Roadhouse, Mr. Dunkley; II: Mr. Jack, Mr. Phillips.
106. Chemistry of Milk and Dairy Products. (4) II. Mr. Tarassuk
107. Chemical Laboratory Control for Dairy Plants. (3) I.
Mr. Tarassuk, Mr. Erway
142. Dairy Bacteriology. (3) I. Mr. Johansson
- 160A-160B. Proseminar. (1-1) Yr. The Staff (Mr. Jack in charge)
(Formerly numbered 160.)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Jack in charge)

* Not to be given, 1949-1950.

GRADUATE COURSES

- 200A-200B. Research in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-6; 1-6) Yr. The Staff (Mr. Jack in charge)
 201A-201B. Seminar in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-1) Yr. The Staff (Mr. Jack in charge)

DECORATIVE ART

(For courses in Decorative Art, see Home Economics, page 335)

ECONOMICS

- 1A. Principles of Economics. (3) I and II. Mr. Hedges, Mr. Black
 I: Mr. Hedges; II: Mr. Black.
 1B. Principles of Economics. (3) II. Mr. Brekke
 199. Special Study for Advanced Undergraduates. (1-3) I and II. Mr. Mehren

EDUCATION

110. Introduction to Educational Psychology. (3) II. Mr. Bursch
 160. Vocational Education. (2) I and II. Mr. Sutherland
 †161. Problems in Vocational Education. (2) I and II. Mr. Sutherland
 170. Secondary Education. (2) II. Mr. Bursch
 198. Directed Group Study of Agricultural Education. (2) II. The Staff (Mr. Sutherland in charge)
 199. Special Study for Advanced Undergraduates in Agricultural Education. (1-5) I and II. The Staff (Mr. Sutherland in charge)

GRADUATE COURSE

- 260A-260B. Vocational Education Seminar. (2-2) Yr. Mr. Griffin, Mr. Sutherland

SUPERVISED TEACHING

- †320A. Introduction to Teaching. (1) I and II. Mr. Juergenson
 †320B. Audio-Visual, Radio, and Other Instructional Resources. (2) I and II. Mr. Juergenson, Mr. Sutherland
 †320C. Supervised Teaching. (3) I and II. Mr. Sutherland, Mr. Juergenson
 †320E. Methods of Teaching. (2) I and II. Mr. Sutherland, Mr. Juergenson
 Sec. 1. Agriculture. Mr. Sutherland, Mr. Juergenson; Sec. 11b. Home-making.
 †323. Practicum in Supervised Teaching. (2) I and II. Mr. Sutherland, Mr. Juergenson

ENGINEERING

- 1A. Plane Surveying. (3) II. Mr. Scott

ENGLISH

- 1A-1B. Reading, Composition, and Speech. (3-3) Yr. Mr. Fishman, Miss Van Norden, Mrs. Wright, Mr. Guyer, Mrs. Homann, Mrs. Needham
 44A-44B. Masterpieces of Literature. (3-3) Yr. Mrs. Homann, Mr. Guyer
 46A-46B. Survey of English Literature. (3-3) Yr. Mr. Fishman, Mrs. Homann
 106L. Advanced Composition. (3) I. Mrs. Wright
 117A. Shakespeare. (3) I. Miss Van Norden
 125C-125D. The Novel. (3-3) Yr. Mrs. Needham
 130C. American Literature: 1885 to the Present. (3) II. Mrs. Wright

† Open only to apprentice teachers and graduate students.

ENTOMOLOGY AND PARASITOLOGY

1. General Entomology. (4) II. Mr. Bohart
 105. Apiculture. (4) II. Mr. Eckert
 107. Queen Bee Rearing. (4) II. Mr. Laidlaw, Jr.
 116. Veterinary Parasitology. (3) I. Mr. Douglas
 124. Economic Entomology. (4) I. Mr. Bailey, Mr. L. M. Smith
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Bailey, Mr. Bohart, Mr. Douglas, Mr. Eckert,
 Mr. Laidlaw, Jr., Mr. Lange, Mr. L. M. Smith

GRADUATE COURSE

- 201A-201B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
 The Staff (Mr. Bailey in charge)

FRENCH

1. Elementary French—Beginning. (4) I and II. Mr. Nelson, Mr. Puknat
 2. Elementary French—Continued. (4) II. Mr. Nelson, Mr. Puknat

GENETICS

100. Principles of Genetics. (4) I. Mr. Gregory

GRADUATE COURSES

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr.
 Mr. Clausen, Mr. Asmundson, Mr. Briggs, Mr. Gregory,
 Mr. Olmo, Mr. Love, Mr. Rick
 201A-201B. Staff Seminar in Genetics. (No credit) Yr.
 The Staff (Mr. Briggs in charge)

GEOLOGY

1. General Geology—Dynamical and Structural. (3) II. Mr. Mathews
 (Formerly numbered 1A.)

GERMAN

1. Elementary German—Beginning. (4) I and II. Mr. Puknat
 2. Elementary German—Continued. (4) II. Mr. Puknat
 3. Intermediate German. (4) I. Mr. Puknat

HISTORY

- 4A-4B. History of Europe. (3-3) Yr. Mr. O'Brien
 8A-8B. History of the Americas. (3-3) Yr. Mr. Morrissey
 17A-17B. History of the United States. (3-3) Yr. Mr. Puryear
 136A-136B. History of Russia and Poland Since the Crimean War. (3-3) Yr.
 Mr. O'Brien
 148. Recent World History. (3) II. Mr. Puryear
 171A-171B. History of the United States. (3-3) Yr. Mr. Puryear
 174B. Recent History of the United States. (3) I. Mr. Shideler
 185. Government and Agriculture of the United States. (3) II. ———
 188A-188B. History of Agriculture in the Americas. (2-2) Yr. Mr. Shideler
 189A-189B. History of California and the Pacific Coast. (3-3) Yr.
 Mr. Morrissey
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Puryear in charge)

HOME ECONOMICS

(For courses offered at Davis, see under Home Economics, page 329)

HORTICULTURE

2. Fruitgrowing. (3) I. Mr. L. D. Davis
- *10. Plant Propagation. (2) II. Mr. R. E. Baker
- 105P. Pomology: Fruit Handling and Varieties. (3) Summer Course (six weeks). Mr. R. M. Brooks
- 105V. Viticulture: Fruit Handling and Varieties. (3) Summer Course (six weeks). Mr. Winkler
- 106A-106B. Fruit Plants. (2-2) Yr. Mr. Crane
110. Fruit Morphology. (3) I. Mr. R. M. Brooks
112. Handling and Storage of Deciduous Fruits and Grapes. (2) I. Mr. Allen
114. Fruit Breeding. (3) II. Mr. Olmo
116. General Viticulture. (4) II. Mr. Winkler
- 120A-120B. Enology. (3-3) Yr. Mr. Amerine
121. Advanced Horticulture. (3) I. Mr. Proebsting
- 130A-130B. Microbiology of Wine Production. (3-2) Yr. Mr. Castor
- *140. Unit Operations in Winery Practice. (2) I. Mr. Guymon
141. Brandy. (2) II. Mr. Guymon
199. Special Study for Advanced Undergraduates in Pomology. (1-5) I and II.
The Staff (Pomology, Mr. Tufts in charge;
Viticulture, Mr. Winkler in charge)

GRADUATE COURSES

- 201A-201B. Research in Pomology. (1-6; 1-6) Yr.
The Staff (Mr. Tufts in charge)
- 205A-205B. Seminar. (1-1) Yr. Mr. L. D. Davis
- 233A-233B. Research in Viticulture and Enology. (1-6; 1-6) Yr.
The Staff (Mr. Winkler in charge)

IRRIGATION

100. Principles Underlying Irrigation in Its Soil and Plant Relationships. (3) II. Mr. Viehmeyer, Mr. Hagan
110. Development and Use of Farm Irrigation Water Supplies and Systems. (4) I. Mr. Johnston
120. Irrigation Hydraulics. (3) I. Mr. Johnston
130. Underground Water and Farm Irrigation Pumping Plants. (3) II. Mr. Scott
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Viehmeyer in charge)

GRADUATE COURSE

- 201A-201B. Research in Irrigation. (1-6; 1-6) Yr.
The Staff (Mr. Viehmeyer in charge)

LANDSCAPE DESIGN

3. Planning the Home Grounds. (2) I and II.

* Not to be given, 1949-1950.

MATHEMATICS

- C. Trigonometry. (3) I and II. The Staff (Mr. Burdette in charge)
- D. Intermediate Algebra. (3) I and II. The Staff (Mr. Hayes in charge)
1. College Algebra. (3) I and II. Mr. Hayes
- 3A. Analytic Geometry and Calculus, First Course. (3) I and II.
Mr. Arnold, Mr. Burdette
- 3B. Analytic Geometry and Calculus, Second Course. (3) I and II.
Mr. Roessler, Mr. Arnold, Mr. Burdette
- 4A. Analytic Geometry and Calculus, Third Course. (3) I and II.
Mr. Alder, Mr. Roessler
- 4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.
Mr. Fulton, Mr. Alder
8. Theory of Algebraic Equations. (3) II. Mr. Burdette, Mr. Hayes
- *10. Spherical Trigonometry. (2) I. _____
- 11A-11B. Analytic Geometry and Calculus. (3-3) Yr.
Mr. Arnold, Mr. Burdette
13. Elementary Statistics. (3) I and II. Mr. Roessler, Mr. G. A. Baker
105. Statistical Methods for Biologists. (3) II.
Mr. Roessler, Mr. G. A. Baker
- 110A-110B. Advanced Calculus. (2-2) Yr. Mr. Burdette
- 130A-130B. Statistical Inference. (3-3) Yr. Mr. G. A. Baker
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Roessler in charge)

GRADUATE COURSES

290. Seminars in Mathematics. (2-6) I and II.
The Staff (Mr. Roessler in charge)
295. Research in Mathematics. (2-6) I and II.
The Staff (Mr. Roessler in charge)

MECHANICAL ENGINEERING

151. Industrial Heat Transfer. (3) I. Mr. Perry, Mr. Henderson
- 152A. Industrial Mass Transfer. (3) II. Mr. Perry

MILITARY SCIENCE AND TACTICS

- 1A. Basic (First Year). (2) I. The Staff
(Formerly numbered 10A.)
- 1B. Basic (First Year). (2) II. The Staff
(Formerly numbered 10B.)
- 2A. Basic (Second Year). (2) I. The Staff
(Formerly numbered 11A.)
- 2B. Basic (Second Year). (2) II. The Staff
(Formerly numbered 11B.)
- 130A-130B. Advanced Infantry (First Year). (3-3) Yr. The Staff
(Formerly numbered 106A-106B.)
- 140A-140B. Advanced Infantry (Second Year). (3-3) Yr. The Staff
(Formerly numbered 107A-107B.)

* Not to be given, 1949-1950.

MUSIC

25A-25B. University Band. (1-1) Yr.	Mr. McArdell
27A-27B. Introduction to Musical Literature. (2-2) Yr.	Mr. McArdell
35A-35B. University Chorus. (1-1) Yr.	Mr. McArdell
75A-75B. University Symphony Orchestra. (1-1) Yr.	Mr. McArdell

PHYSICAL EDUCATION

1. Physical Education for Men. ($\frac{1}{2}$) I and II.	Mr. Toomey, Mr. Boyer, Mr. Forbes, Mr. Hickey, Mr. Schall, Mr. Stromgren, Mr. E. S. Wilson
26. Physical Education for Women. ($\frac{1}{2}$) I and II.	Miss Welch

PHYSICS

2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.	Mr. Gardner, Mr. Patten, Mr. Skolil
3A-3B. General Physics Laboratory. (1-1) Yr. Beginning each semester.	Mr. Gardner, Mr. Patten, Mr. Skolil
4A. General Physics. (4) II.	Mr. Gardner, Mr. Patten
4B. General Physics. (4) I.	Mr. Gardner, Mr. Patten
4C. General Physics. (4) II.	Mr. Gardner, Mr. Patten
106. Atomic Structure and Structure of Matter. (3) II.	Mr. Gardner
*112. Heat. (3) I. (Formerly numbered 116.)	Mr. Patten
*129. Introduction to Electronics. (3) II.	Mr. Gardner
199. Special Study for Advanced Undergraduates. (1-5) I and II.	The Staff

PHYSIOLOGY

1. Introductory Physiology Lecture. (3) I. (Formerly numbered 1A.)	Mr. Casady
11L. Introductory Physiology Laboratory. (2) I. (Formerly numbered 1C.)	Mr. Casady

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science)

PLANT PATHOLOGY

120. Plant Diseases. (4) II.	Mr. Leach, Mr. Houston, Mr. Nyland
122. Plant Pathology Methods. (2) I.	Mr. Hewitt
124A-124B. Pathogenic Fungi. (3-3) Yr.	Mr. English, Mr. Nyland
125. Diseases of Crop Plants. (2) II.	Mr. Kendrick, Mr. E. E. Wilson
199. Special Study for Advanced Undergraduates. (1-5) I and II.	Mr. Kendrick, Mr. Leach, Mr. E. E. Wilson, Mr. Hewitt, Mr. Houston, Mr. Oswald, Mr. English, Mr. Grogan, Mr. Nyland

GRADUATE COURSE

230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr.	Mr. Kendrick, Mr. English, Mr. Grogan, Mr. Hewitt, Mr. Houston, Mr. Leach, Mr. Nyland, Mr. Oswald, Mr. E. E. Wilson
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* Not to be given, 1949-1950.

POLITICAL SCIENCE

113. American Political Theory. (2) II. Mr. Shideler
 151. American National Government. (3) I. Mr. Puryear

POMOLOGY

(For courses in Pomology, see Horticulture)

POULTRY HUSBANDRY

1. Poultry Production. (3) II. Mr. Asmundson, Mr. F. W. Lorenz
 104. Poultry Feeds and Feeding. (3) I. Mr. Kratzer
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Asmundson in charge)

GRADUATE COURSE

- 200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.
 Mr. Asmundson, Mr. Kratzer, Mr. F. W. Lorenz, Mr. W. O. Wilson

PSYCHOLOGY

- 1A. General Psychology. (3) I. Mr. Bursch
 2. Survey of Psychology. (3) I. Mr. Bursch

PUBLIC HEALTH

- *5A. Elementary Public Health. (3) II. _____

SOIL SCIENCE

106. Elements of Soil Science. (4) II. Mr. L. E. Davis
 110. The Soil as a Medium for Plant Growth. (4) I. Mr. Conrad
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

GRADUATE COURSE

- 200A-200B. Research in Soil Science. (1-6; 1-6) Yr.
 Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

SPANISH

1. Elementary Spanish—Beginning. (4) I and II. Mr. Nelson
 2. Elementary Spanish—Continued. (4) I and II. Mr. Nelson

SPEECH

- 1B. Principles and Types of Speech. (3) I and II. Mr. Guyer, Mrs. Needham

SUBJECT A: ENGLISH COMPOSITION

- Subject A. English Composition. (No credit) I and II.
 Mrs. Jasper, Mrs. Sikes

TRUCK CROPS

1. Vegetable Production. (3) I and II. Mr. O. A. Lorenz, Mr. Hanna
 I: Mr. Lorenz; II: Mr. Hanna.
 105. Systematic Olericulture. (3) I. Mr. Rick
 112. Storage, Handling, and Transit of Vegetables. (2) I. Mr. Morris
 121. Vegetable Physiology. (3) II. Mr. Mann, Mr. Pratt
 122. Advanced Truck Crops. (3) I. Mr. Knott
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Knott in charge)

* Not to be given, 1949-1950.

GRADUATE COURSES

- 200A-200B. Research in Truck Crops. (1-6; 1-6) Yr.
 Mr. Knott, Mr. G. N. Davis, Miss Esau, Mr. Harrington, Mr. O. A. Lorenz, Mr. MacGillivray, Mr. Mann, Mr. Morris, Mr. Pratt, Mr. Rick, Mr. P. G. Smith.
- 201A-201B. Seminar in Truck Crops. (1-1) Yr.
 The Staff (Mr. Knott in charge)

VETERINARY SCIENCE

111. Principles of Pathology and Control of Diseases of Domestic Animals. (3) II. Mr. Jasper
120. Anatomy of Domestic Animals. (9) I.
 Mr. Hart, Mr. DeOme, Mr. Julian, Mr. Schalm
121. Microbiology. (10) II. Mr. Hinshaw, Mr. Beach
122. Comparative Pathology. (10) I. Mr. Jasper, Mr. DeOme
123. Comparative Pharmacology. (10) II. Mr. Peoples
124. Veterinary Parasitology. (4) II. Mr. Douglas
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Hart in charge)

GRADUATE COURSE

- 200A-200B. Research in Animal Pathology. (1-6; 1-6) Yr.
 Mr. Hart, Mr. H. S. Cameron, Mr. Hinshaw, Mr. Jasper

VITICULTURE

(For courses in Viticulture and Enology, see Horticulture)

ZOOLOGY

- 1A. General Zoölogy. (4) I. Mr. Storer, Mr. Miller, Mr. Hildebrand
- 1B. General Zoölogy. (4) II. Mr. Miller
10. General Biology. (3) II. Mr. Hildebrand
- 100A. Vertebrate Embryology. (2) I. Mr. Rosenberg, Mr. Hildebrand
- 100C. Vertebrate Embryology Laboratory. (2) I.
 Mr. Rosenberg, Mr. Hildebrand
104. Materials and Methods of Animal Micrology. (3) II. Mr. Rosenberg
107. Microanatomy. (4) II. Mr. Rosenberg
- *110. Protozoölogy. (4) II. Mr. Rosenberg
116. Economic Vertebrate Zoölogy. (3) II. Mr. Storer
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Storer in charge)

GRADUATE COURSE

- 200A-200B. Research in Zoölogy. (1-6; 1-6) Yr.
 The Staff (Mr. Storer in charge)

(GIVEN AT RIVERSIDE)

GRADUATE COURSES

ENTOMOLOGY

- 200A-200B. Seminar in Entomology, Including Biological Control. (1-1) Yr.
 The Staff (Mr. Boyce, Mr. H. S. Smith in charge)

* Not to be given, 1949-1950.

201A-201B. Research in Entomology. (2-6; 2-6) Yr.

Mr. Boyce, Mr. H. S. Smith

205A-205B. Research in Biological Control. (2-6; 2-6) Yr. Mr. H. S. Smith

HORTICULTURE

201A-201B. Research in Subtropical Horticulture. (1-6; 1-6) Yr.

Mr. Condit

PLANT PATHOLOGY

201A-201B. Seminar in Plant Pathology. (1-1) Yr.

The Staff (Mr. Klotz in charge)

230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr.

Mr. Klotz

PLANT PHYSIOLOGY

203A-203B. Research in Plant Physiology. (1-6; 1-6) Yr.

205A-205B. Seminar in Plant Physiology. (1-1) Yr.

The Staff (——— in charge)

SOIL SCIENCE

202A-202B. Research in Soils. (1-6; 1-6) Yr.

Mr. Chapman

237A-237B. Seminar in Soils. (1-1) Yr.

The Staff (Mr. Chapman in charge)

ANATOMY

A Division of the Medical School

HERBERT MCLEAN EVANS, B.S., M.D., D.med. h.c. (Freiburg and Santiago), Sc.D. (San Marcos), Docteur h.c. (Paris), Professor of Anatomy, Morris Herzstein Professor of Biology, and Director of the Institute of Experimental Biology.

WILLIAM R. LYONS, Ph.D., Professor of Anatomy.

JOHN B. DE C. M. SAUNDERS, M.B., Ch.B., F.R.C.S. (Edin.), Professor of Anatomy and Lecturer in Medical History and Bibliography (Chairman of the Division of Anatomy).

MIRIAM E. SIMPSON, Ph.D., M.D., Professor of Anatomy.

ALEXEI A. KONEFF, M.D., Associate Professor of Anatomy and Lecturer in Histological Technique.

WILLIAM O. REINHARDT, A.B., M.D., Associate Professor of Anatomy.

C. WILLET ASLING, Ph.D., M.D., Assistant Professor of Anatomy.

PAUL A. SLATTERY, M.D., Instructor in Anatomy.



BERTRAM FEINSTEIN, M.D., Lecturer in Anatomy.

Letters and Science List.—All undergraduate courses in anatomy are included in the Letters and Science List of Courses. For further information concerning this list, see page 85.

UPPER DIVISION COURSES

101. Histology and Microscopic Organology. (6) I.

Miss Simpson in charge, Mr. Evans, Mr. Koneff, Mr. Lyons

Three laboratory and three lecture periods a week. Prescribed for students in the first year of the Medical School.

Prerequisite: chemistry, physics, elementary biology or zoölogy, and either embryology or physiology, preferably embryology. Enrollment limited.

102. General Human Anatomy. (3) II. Mr. Asling
Lectures and laboratory.
Prerequisite: Zoölogy 1A or Physiology 1, 1L. Enrollment limited to two hundred students.
Demonstration and laboratory study of prepared human dissections, models, and microscopic slides. Not open to freshmen or to premedical or pre dental students.
103. Neuroanatomy. (4) I. Mr. Saunders in charge, Mr. Feinstein
Lectures and laboratory. Enrollment limited to twelve students.
105. Systematic Human Anatomy. (5) I.
Mr. Reinhardt in charge, Mr. Saunders, Mr. Slattery
Lectures. Prescribed for students in the first year of the Medical School. Enrollment limited to seventy-two students. Course 105X must be taken concurrently.
- 105X. Systematic Human Anatomy (Laboratory). (6) I.
Mr. Reinhardt in charge, Mr. Slattery
Prescribed for students in the first year of the Medical School; must be taken concurrently with course 105.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Evans and Mr. Saunders in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

209. Human Embryology. Credit to be arranged. I and II. Mr. Evans
Opportunity is offered for the study of specific problems in human embryology. Open only to students familiar with vertebrate embryology.
210. Physiological Anatomy of Reproduction. (2) I and II. Mr. Evans
Two hours weekly.
Informal conferences and demonstrations. Outside reading required.
211. Haematology. I and II. Miss Simpson
Credit to be arranged.
212. Dynamic Morphology. I and II. Mr. Saunders
Hours and credit to be arranged.
Laboratory work, special reading, and informal conferences.
213. Original Investigation. I and II.
The Staff (Mr. Evans and Mr. Saunders in charge)
Hours and credit to be arranged.
Students who are prepared to undertake research in the anatomical sciences will be afforded facilities and encouragement by members of the staff.
214. Anatomy for Physicians and Advanced Students. (1-8) I and II.
The Staff (Mr. Saunders in charge)
This course is offered in Berkeley and San Francisco.

ANTHROPOLOGY

EDWARD W. GIFFORD, Professor of Anthropology and Director of the Anthropological Museum.

ROBERT H. LOWIE, Ph.D., Sc.D., Professor of Anthropology (Chairman of the Department).

* DAVID G. MANDELBAUM, Ph.D., Professor of Anthropology.

RONALD L. OLSON, Ph.D., Professor of Anthropology.

* In residence spring semester only, 1949-1950.

A. L. KROEBER, Ph.D., Sc.D., Professor of Anthropology, Emeritus, and Director of the Anthropological Museum, Emeritus.

†THEODORE D. McCOWN, Ph.D., Associate Professor of Anthropology and Curator of the Anthropological Museum and Lecturer in Criminology.

ROBERT F. HEIZER, Ph.D., Assistant Professor of Anthropology, Director of the California Archaeological Survey, and Assistant Curator of North American Archaeology.

JOHN H. ROWE, Ph.D., Assistant Professor of Anthropology and Assistant Curator of South American Archaeology.



DARRELL A. AMYX, Ph.D., Assistant Curator of Ancient Mediterranean Art and Assistant Professor of Art.

SHERBURNE F. COOK, Ph.D., Professor of Physiology.

H. F. LUTZ, Ph.D., D.D., Associate Curator of Near Eastern Archaeology and Professor of Egyptology and Assyriology.

GEORGE A. PETTIT, Ph.D., Lecturer in Anthropology.

H. R. W. SMITH, Ph.D., Associate Curator of Classical Archaeology and Professor of Latin and Classical Archaeology.

WINFIELD S. WELLINGTON, M.A., Gr.Arch., Associate Curator of Art, Director of the Art Gallery, and Associate Professor of Decorative Art.

Letters and Science List.—All undergraduate courses in anthropology are included in the Letters and Science List of Courses. For further information concerning this list, see page 85.

Departmental Major Adviser: Mr. Rowe.

Preparation for the Major.—Required: Anthropology 1, 2A–2B (10). Recommended: History 4A–4B; Near Eastern Languages 13A–13B, 25A–25B; Oriental Languages 42; Zoölogy 10. On the basis of the student's record in the lower division, the department will decide whether he will be permitted to make anthropology his major.

The Major.—Required: Anthropology 105A or 105B, 153; 101A–101B; and other courses aggregating 12 upper division units in anthropology; with substitution permitted among these 12, on approval by the department of some definite plan, up to 6 units in allied subjects, as suggested by the following list of courses: Anatomy 102; Classics 193, 194, 197; Decorative Art 127; Geography 121, 122A–122B; German 125; Near Eastern Languages 102A–102B; Oriental Languages 172A–172B, 177, 179B; Paleontology 126; Philosophy 108, 147; Psychology 141, 145; Public Health 160A; Sociology 141A–141B, 166A–166B; Zoölogy 114, 115.

Students who fail to maintain a satisfactory scholarship average may be dismissed from the major at any time.

LOWER DIVISION COURSES

1. General Anthropology: Physical and Biological Factors. (4) I and II.
Lectures and two section meetings a week. Mr. Heizer, Mr. McCown
Human biology in terms of human evolution, fossil man, races, race differences, and problems.
- 2A–2B. General Anthropology: Cultural Factors. (3–3) Yr.
Lectures and one section meeting a week. Mr. Rowe, Mr. Olson
2A. Prehistory and cultural growth. Mr. Rowe
2B. Cultural patterns and dynamics. Mr. Olson

† Sabbatical leave in residence, 1949–1950.

UPPER DIVISION COURSES

General prerequisite: courses 1, 2A-2B, or junior standing.

- 101A-101B. *Ethnography of the World.* (3-3) Yr. Mr. Lowie
A descriptive survey of representative primitive cultures, including backward peoples of civilized countries. Either half of the course may be taken independently.
- 105A-105B. *The American Indians.* (3-3) Yr. Mr. Heizer, Mr. Rowe
Development, spread, and attainments of culture; native races and languages.
105A. Central America, Mexico, and North America. Mr. Heizer
105B. South America. Mr. Rowe
Either half of the course may be taken independently.
106. *Archaeology of North America.* (3) II. Mr. Heizer
Prehistory of North American Indians; prehistoric culture areas; relations with historic Indians.
- *111. *Prehistory.* (3) II. Mr. McCown
Prerequisite: course 2A.
Origin, development, and distribution in space and time of the prehistoric cultures of the Old World.
- *112. *Protohistoric Ethnography of Europe.* (3) I. Mr. McCown
Manners and customs; social and economic organization; art and religion of the prehistoric and protohistoric peoples of Europe.
- *115. *Peoples of the Philippines and Indonesia.* (3) I. Mr. Gifford
Geography, races, populations, cultures, and development of the Philippines, as part of the larger Indonesian sphere of world history.
- 118A*-118B. *The Nature of Culture.* (3-3) Yr. Mr. Mandelbaum
118A. The general structure and basic processes of cultural behavior; illustrative materials from primitive societies and modern civilizations.
118B. The dynamics of cultural life; analysis of life history materials and contemporary events.
Either half of the course may be taken independently.
120. *Language and Culture.* (3) I. Mr. Rowe
Language and thought; classification of languages; linguistic aspects of culture; language, nation, and state.
124. *Primitive Religion.* (3) I. Mr. Lowie
Comparative survey of religion and magic.
- 125A-125B. *Comparative Society.* (3-3) Yr. Mr. Olson
The development of human society, with emphasis on the growth of modern institutions out of primitive kinship, social, and territorial units.
Either half of the course may be taken independently.
126. *Invention and Technology.* (3) II. Mr. Gifford
Psychology of invention; origin, history, and spread of fundamental inventions; illustrative material from the Museum of Anthropology.
- *137. *Indians of California.* (3) II. Mr. Heizer
Origin and relationships of the natives; prehistoric remains; shell mounds. Tribal divisions; arts; customs; industry; beliefs.
139. *Africa.* (3) I. Mr. Gifford
Races; Egyptian, Mediterranean, and Negro cultures, past and present; native achievement; Asiatic relations and influences.
141. *Mexico and Central America.* (3) I. Mr. Olson
Achievements of the Aztecs, Mayas, and their predecessors.

* Not to be given, 1949-1950.

142. Peoples of the Andes. (3) II. Mr. Rowe
 Culture of the Incas of Peru and of other Andean peoples.
- *143. Peoples of India. (3) II. Mr. Mandelbaum
 A survey of the principal culture groups of India. Problems of the primitive tribes, village life, religious affiliations, caste structure, and their relation to the contemporary scene in India.
- *147. Peoples and Cultures of the Pacific Islands. (3) II. Mr. Gifford
 Oceanian races and cultures; indigenous origins; Asiatic relations and influences.
- *150A-150B. Physical Anthropology. (3-3) Yr. Mr. McCown
 Lecture and laboratory. Prerequisite: course 1.
 Evolutionary development of man; anthropometry; analysis of data; criteria of race. Enrollment limited to twelve students; primarily for major students in anthropology and the medical sciences.
- *152. Fossil Man. (3) II. Mr. McCown
 Prerequisite: course 1 or Paleontology 1.
 Origin and relationships of the extinct forms of mankind.
153. Living Races of Man. (3) I. Mr. McCown
 Physical characters, distribution, and relationships of the living races of mankind.
160. Contemporary Civilization. (3) II. Mr. Lowie
 An application of anthropological principles of analysis and interpretation to contemporary civilization.
170. Primitive Education. (2) II. Mr. Pettitt
 Methods and problems in the transmission of culture from generation to generation.
195. Field Course in Archaeological Method. (1) II. Mr. Heizer
 Lectures, museum preparation, and week-end excavations.
 Enrollment limited to eighteen students, admitted by consent of the instructor. With the consent of the instructor, may be repeated without duplication of credit.
- *196. Archaeological Method. (2) I. Mr. Heizer
 Prerequisite: course 195 and consent of the instructor. Enrollment limited to twenty students. With the consent of the instructor, may be repeated without duplication of credit.
 Museum preparation, advanced field investigation, and guidance in preparation of museum material for publication.
198. Preceptorial and Reading Course. (3) I. Mr. Rowe
 Systematic readings in the history of anthropology and in significant modern developments within the field.
 Open to seniors. With the consent of the instructor, may be repeated without duplication of credit.
199. Special Study for Advanced Undergraduates. (2-3) I and II.
 The Staff (Mr. Olson in charge)

RELATED COURSES IN OTHER DEPARTMENTS

- General Human Anatomy (Anatomy 102).
 Evolution and Classification of Fossil Mammals (Paleontology 126).
 Biometry (Public Health 160A).
 Genetics (Zoölogy 114).
 Human Genetics (Zoölogy 115).
 India (Classics 197).

* Not to be given, 1949-1950.

- Religion and Mythology of Egypt, Babylonia, and Assyria (Near Eastern Languages 102A-102B).
 Buddhism as a Cultural Factor in the Far East (Oriental Languages 172A-172B).
 Oriental Societies (Sociology 166A-166B).
 Social Philosophy (Philosophy 108).
 Theories of History (Philosophy 147).
 Personality in Society and Culture (Psychology 141).
 Social Psychology (Psychology 145).
 History of Western Social Organization (Sociology 141).
 Introduction to General Linguistics (Classics 193).
 Phonetics and Phonemics (Classics 194).
 Types of Linguistic Structure (Oriental Languages 177).
 Linguistics Laboratory (Oriental Languages 197B).
 Geography of North America (Geography 121).
 Geography of Middle America (Geography 122A).
 Geography of South America (Geography 122B).
 Primitive Art (Decorative Art 127).
 Introduction to Folklore (German 125).

PROFESSIONAL COURSES

These courses are intended as a nucleus of study relating to museums. Students wishing to prepare for general museum work should supplement these with such courses as Paleontology 125, Zoölogy 113, and Architecture 14.

489. Museums and Their Work. (3) I. Mr. Gifford
 Lectures and field trips.
 Types of museums, buildings, administration, publicity, exhibition, school service, adult education and organized group service, curatorial work, lectures, and demonstrations.
490. Museum Methods. (2) II. Mr. Gifford
 Prerequisite: course 489. Limited to five students.
 Practical exercises in classification, cataloguing, care, restoration, installation, labeling, and display of specimens; exhibition devices, models, loan collections, research collections; docentry practice.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

206. Proseminar. (2) I and II. Mr. Heizer, Mr. Mandelbaum
 Introduction to research. For new graduate students in anthropology.
- 207A-207B. History and Theory of Anthropology. (2-2) Yr. Mr. Lowie
 Prerequisite: course 206.
- 209A-209B. Culture Problems of Eurasia and North America. (2-2) Yr.
 Prerequisite: course 206. Mr. Olson
- *210. Cultural Relationships Between North and South America. (2) II.
 Prerequisite: course 206. Mr. Heizer
- *211. Problems in the Culture History of Europe and the Mediterranean.
 (2) II. Mr. McCown
 Prerequisite: course 206.
- 218H. Culture and Personality: the Psychological Approaches. (2) II.
 Mr. Mandelbaum

* Not to be given, 1949-1950.

235. Problems in the Culture History of South America. (2) II. Mr. Rowe
Prerequisite: course 206.
237. Culture Problems of Western North America. (2) II. Mr. Heizer
Prerequisite: course 206.
Work on problems of tribal distribution and cultures.
- *247. Problems in Oceanian Anthropology. (2) I. Mr. Gifford
Prerequisite: course 206.
Survey of evidence available on various aspects of Oceanian cultures;
significance of distributions; relationships with continental cultures.
250. Problems in Human Demography and Ecology. (2) I.
Mr. Cook, Mr. Heizer
The problem for the fall semester, 1949, will concern the aboriginal
populations of the Pacific Coast area.
299. Directed Research. (2-6) I and II. The Staff (Mr. Lowie in charge)

MUSEUM OF ANTHROPOLOGY

The Museum of Anthropology, organized in 1901 with the Phoebe A. Hearst collections as nucleus, is in storage in the temporary Anthropology Museum building, although special exhibits are occasionally arranged in connection with courses of instruction. The contents include 75,000 inventoried artifacts from native California, 51,000 from other parts of the New World, 37,000 from the Eastern Hemisphere, 7,600 skeletal items, 14,000 photographic negatives, 2,700 phonograph records. The collections are available for study by scholars and advanced graduate students. Those interested in the Museum's facilities may address the Director, Mr. E. W. Gifford.

ARCHITECTURE

- MICHAEL B. GOODMAN, M.A., Professor of Architecture.
RAYMOND W. JEANS, M.A., Professor of Architecture.
² STAFFORD L. JORY, Gr.Arch., Professor of Architecture.
HOWARD MOÏSE, B.S., M.Arch., Professor of Architecture.
WARREN C. PERRY, B.S., F.A.I.A., Professor of Architecture (Acting Chairman of the Department).
WILLIAM C. HAYS, B.S., F.A.I.A., Professor of Architecture, Emeritus.
JACQUES SCHNIER, M.A., Associate Professor of Sculptural Design.
GEORGE A. DOWNS, M.F.A., Associate Professor of Architecture.
GEORGE P. SIMONDS, M.A., Assistant Professor of Architecture.
HAROLD A. STUMP, A.B., Assistant Professor of Architecture.
HENRY J. LAGORIO, M.A., Instructor in Architecture.
C. ARTHUR STEINER, M.A., Instructor in Architecture.



- THOMAS F. CHACE, B.S., Lecturer in Architecture.
E. MICHAEL CZAJA, M.Arch., Lecturer in Architecture.
JAMES GAYNER, Lecturer in Architecture.
ROBERT S. KITCHEN, B.Arch., Lecturer in Architecture.
JOSEPH P. MILANO, A.B., Lecturer in Architecture.
RICHARD O'HANLON, Lecturer in Sculptural Design.
WILLIAM M. RICE, A.B., Lecturer in Architecture.
L. DEMING TILTON, B.S., Lecturer in Architecture and Political Science.

* Not to be given, 1949-1950.

² In residence spring semester only, 1949-1950.

Letters and Science List.—Courses 5A, 5B, 5C, 6A, 6B, 6C, 14, 113, 114, 117, 120A–120B, 146, 148A, and 148B are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

LOWER DIVISION COURSES

The full course in History of Architecture (5A, 5B, 5C) is covered in three semesters, the parts being given in rotation in that order; no part is prerequisite to another. Courses 5A, 5B, 5C are required of all students enrolled in the curriculum in architecture, and must be accompanied by courses 6A, 6B, 6C; enrollment in the last-named courses is limited to students following the curriculum.

Credit in courses 12, 13, 14, 112, 113, 115 will be allowed up to a total of 4 units each; in course 114 credit will be allowed up to a total of 8 units; but in no semester will more than 2 units be allowed in any one of these courses. (Consent of instructor must be obtained to take more than 1 unit in any given semester.)

1. Architectural Drawing. (3) I and II. Mr. Stump, Mr. Lagorio
Six hours weekly. Lecture and drafting practice.
Study of architectural forms and composition.
2. Architectural Drawing: Descriptive Geometry. (3) I and II. Mr. Stump, Mr. Lagorio
Six hours weekly. Lecture and drafting practice.
Prerequisite: solid geometry.
3. Architectural Drawing: Shades and Shadows; Perspective. (3) I and II. Mr. Stump, Mr. Lagorio
Six hours weekly. Lecture and drafting practice.
Prerequisite: course 2.
4. Elementary Design and Theory. (4) I and II. Mr. Czaja, Mr. Downs, Mr. Kitchen
Eight hours weekly.
Prerequisite: courses 1, 2, and 3.
- *5A. Architecture of Ancient and Classic Times. (2) I. Mr. Jory
- 5B. Architecture of the Dark Ages and the Middle Ages. (2) I. Mr. Moise
- 5C. Architecture of the Renaissance. (2) II. Mr. Perry
- *6A. Classwork in Ancient and Classic Architecture. (1) I. Mr. Moise, Mr. Downs, Mr. Goodman, Mr. Czaja, Mr. Milano
- 6B. Classwork in Medieval Architecture. (1) I. Mr. Downs, Mr. Czaja, Mr. Milano
- 6C. Classwork in Renaissance Architecture. (1) II. Mr. Jory, Mr. Downs, Mr. Moise, Mr. Czaja, Mr. Milano
12. Rendering in Water Color. (1) I and II. Mr. Goodman, Mr. Downs
Three hours weekly. Two sections to be given.
Prerequisite: Art 2A or equivalent.
13. Rendering in Pen and Ink. (1) I and II. Mr. Jeans, Mr. Czaja
Three hours weekly. Two sections to be given.
Prerequisite: Art 2A or equivalent.
14. Elements of Sculpture. (2) I and II. Mr. Schnier, Mr. O'Hanlon
Six hours weekly. Four sections.
18. Introduction to Architecture. (1) I and II. Mr. Simonds
Lectures for beginning students in architecture; drafting practice.
Prerequisite: course 1 or equivalent.

* Not to be given, 1949–1950.

UPPER DIVISION COURSES

The general prerequisite for upper division courses is junior standing.

- 101A-101B. Design and Theory: Junior Problems. (5-5) Yr. Beginning each semester. Mr. Downs, Mr. Goodman, Mr. Jory, Mr. Milano, Mr. Rice, Mr. Simonds, Mr. Steiner
 Ten hours weekly.
 Prerequisite: courses 1, 2, 3, and 4.
- 102A-102B. Design and Theory: Senior Problems. (5-5) Yr. Beginning each semester. Mr. Moise, Mr. Perry
 Ten hours weekly.
 Prerequisite: course 101A-101B.
- †102C-102D. Design and Theory. (5-5) Yr. Mr. Moise
 Ten hours weekly.
 Prerequisite: course 102A-102B.
- 108A-108B. Architectural Mechanics. (3-3) Yr. Mr. Gayner
 Prerequisite: Physics 2A-2B.
110. The House. (1) I and II. Mr. Goodman, Mr. Jeans
112. Advanced Water-Color Rendering. (1) I and II. _____
 Three hours weekly.
 Prerequisite: course 12 (1 unit with grade of A or B).
113. Sculptural Design. (2) I. Mr. Schnier
 Six hours weekly.
 Prerequisite: course 14 (2 semesters), or course 114 (1 semester).
114. The Human Figure in Sculpture. (2) I and II. Mr. Schnier
 Six hours weekly.
 Prerequisite: course 14 (2 semesters), or course 1 and 14 (1 semester).
115. Rendering in Pencil. (1) I and II. Mr. Kitchen, Mr. Steiner
 Two hours weekly.
 Prerequisite: course 13 (1 unit).
117. Introduction to Housing and Planning. (3) I and II. Mr. Moise
 Occasional seminars and field trips as arranged.
 Prerequisite: senior standing.
- 120A-120B. Introduction to City and Regional Planning. (1-1) Yr. Mr. Tilton
 Prerequisite: junior standing.
 Course 120A is not prerequisite to 120B.
- 121A-121B. Principles of Community Design. (2-2) Yr. Mr. Tilton
 Two lectures and one section meeting weekly.
 Prerequisite: courses 120A-120B, 117, or equivalent preparation in landscape design or civil engineering.
 The needs of the modern community and the problems of design involved in typical city planning projects; with required reading, field trips, reports, and simple design problems.
 Course 121A is not prerequisite to 121B.
146. Expressionism in Sculpture. (2) II. Mr. Schnier
 Two hours weekly.
 Prerequisite: junior standing.
- 148A-148B. Sculpture Methods and Materials. (2-2) Yr. Mr. O'Hanlon, Mr. Schnier
 Six hours weekly.
 Prerequisite: course 14 (2 semesters) or course 114 (1 semester).
- †199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Perry in charge)
 By arrangement only.

† To be given if a sufficient number of students enroll.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

200. Comprehensive Graduate Problem. (5) I. Mr. Jeans
 Twelve hours weekly. A semester problem, including all phases of design, structure, and construction details. Given only in conjunction with course 207.
- 201A. Design and Theory: Graduate Sketch Problems. (1) I and II.
 Prerequisite: course 102A-102B. Mr. Perry, Mr. Downs
- 201B. Design and Theory: Graduate Problems. (7) II. Mr. Perry
 Prerequisite: course 101A-101B and course 102A-102B with at least a grade of B.
- †202. Design and Theory: Advanced Problems and Research. (6) I and II.
 Prerequisite: courses 200, 201A-201B, 207. Mr. Perry
207. Architectural Engineering. (3) I. Mr. Chace
 This course is coördinated with course 200 and must be taken with it.
208. Seminar in Architecture. (3) I and II. Mr. Perry
 For candidates for the degree of Master of Arts only.
209. Seminar in Professional Practice. (2) I and II. Mr. Jeans
 Prerequisite: courses 200, 207, and graduate standing.
 A course in specification writing, professional practice, and business relations for candidates for degree of Master of Arts only.
- †298. Special Study for Graduate Students. (2-4) I and II.
 By arrangement only. The Staff (Mr. Perry in charge)

REQUIRED COURSES IN OTHER DEPARTMENTS

- General Physics Lectures (Physics 2A-2B).
 General Physics Laboratory (Physics 3A-3B).
 Introduction to Mathematical Analysis (Mathematics 3A, 3B, 4A).
 Form (Art 2A).
 Strength of Materials (Engineering 18A, 18B; Civil Engineering 108F).
 Elements of Framed Structures (Civil Engineering 112, 107E, 107F).
 Plane Surveying (Engineering 21).

ART

- ¹JOHN HALEY, Professor of Art.
 *WALTER W. HORN, Ph.D., Professor of Art.
 WARD LOCKWOOD, Professor of Art.
 ERLE LORAN, Professor of Art.
 OTTO J. MAENCHEN, Ph.D., Professor of Art.
 STEPHEN C. PEPPER, Ph.D., Professor of Philosophy and Aesthetics (Chairman of the Department of Art).
 WORTH RYDER, Professor of Art.
 EUGEN NEUHAUS, Ph.D. (hon.c.), Professor of Art, Emeritus.
 OLIVER M. WASHBURN, A.B., Professor of the History of Art, Emeritus.
 RAY S. BOYNTON, Associate Professor of Art, Emeritus.

† To be given if a sufficient number of students enroll.

* Absent on leave fall semester; sabbatical leave in residence spring semester, 1949-1950.

¹ In residence fall semester only, 1949-1950.

²CHIURA OBATA, Associate Professor of Art.

MARGARET P. O'HAGAN, M.A., Associate Professor of Art.

²GLENN WESSELS, M.A., Associate Professor of Art.

DARELL A. AMYX, Ph.D., Assistant Professor of Art.

JAMES MCCRAY, M.A., Assistant Professor of Art.



LEZ L. HAAS, M.A., Lecturer in Art for the fall semester.

ROBERT STERLING, JR., M.A., Lecturer in Art for the fall semester.

Letters and Science List.—All undergraduate courses in art are included in the Letters and Science List of Courses. For further information concerning this list, see page 85.

Departmental Major Advisers: Appreciation and Practice of Art: Mr. Wes- sels, Mr. Loran; History of Art: Mr. Amyx.

Preparation for the Major.—Six units chosen from courses 1A, 1B, 1C, and 1D; and courses 2A–2B, 3A–3B. These requirements apply both to majors in Appreciation and Practice of Art and to majors in History of Art. Recommended for prospective majors in History of Art: History 4A–4B; Near Eastern Languages 13A–13B.

The Major.—A student may elect a major in Appreciation and Practice of Art or History of Art. Major students are required to consult with their major advisers regarding their programs before registering.

The department will recommend for graduation only students with at least a C average. Students who fail to maintain at least a C average may be asked to drop the major at any time.

I. Appreciation and Practice of Art. Required: 12 units of Group A courses under three different artists, 2 units of Group B, 4 units of Group C, and 6 units chosen from Group A, B, or C.

II. History of Art. Required: 12 units of Group C; Philosophy 136A; and 9 additional units of any courses in Group A, B, or C. With approval, substitutions may be made of certain courses offered in other departments. Students planning to do advanced work in History of Art are urged to develop their knowledge of foreign languages (especially French and German) as early as possible.

Assignment to Sections.—Inasmuch as space and facilities for technical courses are limited, students are advised to enroll in all Group A courses during the days of registration to be announced on placards on bulletin boards. Preference is given to first applicants.

Transfer Students.—Transfer students who have fulfilled unit requirements elsewhere are: (a) required to take an examination in order to qualify for Group A courses, and (b) are requested to present examples of their work done in other institutions before being admitted to classes and before credit can be given toward the major for work done elsewhere.

Students who qualify will be advised to take course 195 in order to acquaint themselves with the methods expected for this department's advanced courses.

LOWER DIVISION COURSES

- | | |
|---|-----------|
| 1A. Art of the Ancient Mediterranean World. (3) II. | Mr. Amyx |
| Lectures and weekly section meetings to be arranged. | |
| From the Stone Age to the end of the Roman Empire. | |
| Prerequisite for all upper division courses in ancient art. | |
| 1B. History of Medieval, Renaissance, and Modern Art—Emphasis on Paint-
ing. (3) II. | Mr. Ryder |
| Lectures and biweekly section meetings to be arranged. | |

² In residence spring semester only, 1949–1950.

- *1C. History of Medieval, Renaissance, and Modern Art—Emphasis on Architecture and Sculpture. (3) I. Mr. Horn
Lectures and weekly section meetings to be arranged.
- 1D. History of Oriental Art. (3) I. Mr. Maenchen
Lectures and weekly section meetings to be arranged.
The art of India, China, and Japan.
- 2A–2B. Form. (2–2) Yr. Beginning each semester.
Mr. Haley, Mr. Lockwood, Mr. Loran, Mr. McCray,
Mrs. O'Hagan, Mr. Ryder, Mr. Wessels
- 3A–3B. Form and Color. (2–2) Yr. Beginning each semester.
Mr. Lockwood, Mr. Loran, Mr. Haley, Mr. McCray,
Mrs. O'Hagan, Mr. Wessels
- Prerequisite: course 2A–2B.
12. Freehand Basic Brushwork in "Sumi" Painting. (2) II. Mr. Obata
24. An Introduction to Art. (2) II. Mr. McCray
(Formerly numbered 19).
Lectures, illustrated with lantern slides.
The understanding and appreciation of painting, sculpture, architecture, and industrial art.

UPPER DIVISION COURSES

Group A: Appreciation and Practice

Prerequisite: courses 2A–2B, 3A–3B.

The various courses in Group A differ in content, use of materials, type of subject matter, etc., depending upon the individual aims of the artists in charge. All courses may be repeated indefinitely without duplication of credit.

The subject matter will range from still life and landscape to life classes, figure and mural compositions.

The materials used will range from charcoal and *sumi* to water color, gouache, egg tempera, oil, mixed technique, and fresco painting.

- *101. Advanced Drawing and Painting. (2) I and II. _____
Representational composition based upon out-of-door subjects in any medium.
102. Advanced Drawing and Painting. (2) I. Mr. Ryder
Composition with the human figure as a basic motif. Drawings in charcoal and pencil. Paintings in tempera, gouache, and wax.
103. Advanced Drawing and Painting. (2) I and II. Mr. Lockwood
Water color, oil, pastel, and black and white media, using figure and costume models.
104. Advanced Drawing and Painting. (2) I. Mr. Haley
105. Advanced Drawing and Painting. (2) I and II. Mr. Loran
106. Advanced Drawing and Painting. (2) I and II. Mr. McCray
108. Advanced Drawing and Painting. (2) I and II. _____
110. Advanced Drawing and Painting. (2) I and II. Mrs. O'Hagan
Plastic organization of the picture, using still life and the human figure as models.
112. Advanced Drawing and Painting. (2) II. Mr. Obata
113. Advanced Drawing and Painting. (2) II. Mr. Wessels
181. Practice in the Graphic Arts. (2) II. Mr. Wessels

* Not to be given, 1949–1950.

Group B: Theory and Criticism

- *107. The Human Figure in Art, Past and Present. (2) II. Mr. Ryder
Prerequisite: course 3A-3B.
The use of the human figure in art, past and present. Problems of light, color, and space involving the figure and its environment.
- *132. History and Theory of Art Criticism. (2) I. Mr. Wessels
Prerequisite: upper division standing and course 1B.
Study of the relation between artist and critic in the visual arts, with some practical experience in criticism.
- *168. Community Art. (2) I. _____
Prerequisite: upper division standing.
173. The Architecture of Paintings. (2) I. Mr. Ryder
Prerequisite: course 2A-2B.
Enrollment limited to fifty.
- Aesthetics. (Philosophy 136A-136B.) (3-3) Yr. Mr. Pepper
Prerequisite: 6 units of philosophy (at the discretion of the instructor these may be waived for students majoring in literature and the fine arts).

Group C: History of Art and Archaeology

153. Aegean Art. (2) I. Mr. Amyx
The art of Crete and Greece in the Bronze Age, with attention to connections with neighboring cultures.
- 154A-154B. Greek Art. (3-3) Yr. Mr. Amyx
From the Geometric Period to the beginning of the Roman Empire.
154A. From 1100 to 400 B.C.
154B. From 400 to 30 B.C.
Either half of the course may be taken separately.
- *159. Roman Art. (3) II. Mr. Amyx
The art of Italy and the Roman Empire, from the Early Iron Age to the period of Constantine.
- 160A-160B. History of Early Chinese Art. (2-2) Yr. Mr. Maenchen
Prerequisite: upper division standing and course 1D or consent of the instructor.
From Shang to T'ang.
- *161. The Art of India. (3) II. Mr. Maenchen
Prerequisite: upper division standing.
162. The Art of Japan. (3) II. Mr. Maenchen
Prerequisite: upper division standing, and course 1D or permission of the instructor.
From prehistoric times to Hokusai.
- *169. History of American Art. (3) I and II. _____
Prerequisite: upper division standing.
- *175A-175B. Medieval Art. (3-3) Yr. Mr. Horn
175A. Early Christian and Byzantine art.
175B. Medieval art.
- *176. Renaissance Art. (3) II. Mr. Horn
- *179. Proseminar in Art History. (2) II. Mr. Horn

SPECIAL STUDY COURSES

195. Special Study in Practice of Art. (2) I and II.
Mr. Loran and Mr. Wessels in charge
Prerequisite: 8 units of practice work, or equivalent taken at another university. May not be repeated for credit.

* Not to be given, 1949-1950.

199. Special Study for Advanced Undergraduates. (1-4) I and II.
 The Staff (Mr. Loran in charge fall semester,
 Mr. Wessels in charge spring semester)
 Prerequisite: senior standing in art, with at least a B average in the
 major, and approval of the department. Credit gained in course 199 will
 be accepted in fulfillment of requirements in Groups A, B, or C.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201. Advanced Study and Practice in a Selected Technique. (4) I and II.
 I: Mr. Loran; II: Mr. Ryder. Mr. Loran, Mr. Ryder
254. Seminar in Ancient Art. (2) I and II. Mr. Amyx
 Concentration on special topics for advanced study, with reports by
 students. This course may be repeated for credit.
- 269A-269B. Seminar in Art. (3-3) Yr. Beginning each semester.
 Two hours weekly, to be arranged. The Staff (Mr. McCray in charge)
 Prerequisite: at least a B average in the undergraduate major in art.
 Applicants must also demonstrate ability in composition in an examination
 which will be set at the opening of the semester. If necessary, 269B may
 precede 269A.
285. Seminar in the History of Early Christian and Medieval Art. (3) II.
 This course may be repeated for credit. Mr. Horn
287. Seminar in the History of Oriental Art. (2) I and II. Mr. Maenchen
 This course may be repeated for credit.
298. Special Study for Graduate Students. (1-6) I and II.
 The Staff (Mr. McCray in charge)
 Prerequisite: at least a B average in the upper division and graduate
 courses taken in the Department of Art. A student may not register with
 more than two instructors in any one semester for credit.
299. Special Study for Graduate Students in the History of Art. (1-4)
 I and II. The Staff (Mr. Amyx in charge)

UNIVERSITY ART GALLERY

The University Art Gallery was established in 1933 with funds contributed for the purpose by the Class of 1933, the Regents of the University, Albert M. Bender, and other generous friends and alumni of the University. Owing to limitations of space and facilities, the Gallery does not maintain a permanently installed exhibition, but presents from time to time temporarily installed exhibits covering various phases of art. The material comprising these exhibits is drawn either from University collections in storage, or borrowed from other institutions and organizations, or from private individuals. Those interested in the Gallery's activities may address the Director, Mr. Winfield S. Wellington.

ASTRONOMY

- STURLA EINARSSON, Ph.D., Professor of Astronomy and Director of the Students' Observatory (Chairman of the Department).
 ROBERT J. TRUMPLER, Ph.D., Professor of Astronomy.
 R. TRACY CRAWFORD, Ph.D., Professor of Astronomy, Emeritus, and Director of the Students' Observatory, Emeritus.
 ARMIN O. LEUSCHNER, Ph.D., Sc.D., LL.D., Professor of Astronomy, Emeritus, and Director of the Students' Observatory, Emeritus.

LELAND E. CUNNINGHAM, Ph.D., Associate Professor of Astronomy.

LOUIS G. HENYEV, Ph.D., Associate Professor of Astronomy.

HELEN PILLANS, M.S., Associate in Astronomy.

Letters and Science List.—All undergraduate courses in astronomy except courses 3, 11, and 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. EINARSSON, Mr. TRUMPLER.

Preparation for the Major.—Physics 4A-4B-4C or equivalents; Mathematics 3A-3B, 4A-4B, 12, or equivalents; Astronomy 7A-7B; and a reading knowledge of French or German.

The Major.—Required: courses 104A-104B, 117A-117B, and 12 more units from the following courses: 107, 108, 115, 199; Mathematics 110A-110B, 119A; Physics 105A-105B, 108B, 115, 121. Students intending to take graduate work in astronomy should complete as many as possible of these courses in the upper division.

Honors in Astronomy.—Honors are recommended on the basis of excellent work in the major.

For a teaching major in mathematics and astronomy, or physics and astronomy, see ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

LOWER DIVISION COURSES

- 1A. Introduction to Astronomy. (3) I and II. ———, Mr. Einarsson
Three lectures and one section meeting weekly.
General facts and principles of the science of astronomy.
- 1B. Continuation of course 1A. (3) II. Mr. Einarsson
Prerequisite: course 1A.
2. Practice in Observing. (2) I and II. Miss Pillans
One lecture and three observing hours to be arranged.
Prerequisite: course 1A and plane trigonometry.
Elementary work with the equatorial telescope, transit, and sextant;
elementary determinations of time, latitude, and longitude; constellation
study. Enrollment limited to sixteen students.
3. Surveyor's Course in Astronomy. (1) II. Mr. Einarsson
Lectures and laboratory.
Prerequisite: Engineering 1A.
Practical astronomy as applied to observations, with the surveyor's
transit for determination of azimuth, latitude, and time.
- 7A-7B. General Astronomy. (3-3) Yr. ———, Miss Pillans
A three-hour laboratory or observing period will be substituted occa-
sionally for one of the lectures.
Prerequisite: Mathematics 3A.
The facts and principles underlying all branches of astronomy. Intended
for majors in the natural sciences and engineering. Required in preparation
for a major in astronomy.
10. Celestial Navigation. (3) I. Mr. Einarsson
Prerequisite: plane trigonometry.
Determination of the line of position; use of nautical almanac, air
almanac, HO 214, and other tables; star identification.
11. Celestial Navigation. (2) II. Mr. Einarsson
Prerequisite: course 10. Enrollment limited to sixteen students.
Sextant observation of celestial objects for determination of position;
compensation of magnetic compass; elements of gyrocompass.

UPPER DIVISION COURSES

A working knowledge of differential and integral calculus is prerequisite to courses 107 and 108.

- 104A-104B. Practical Astronomy. (3-3) Yr. Mr. Trumpler
Prerequisite: Mathematics 3A-3B, Physics 4A-4B, and either course 1A-1B or 7A-7B. Courses 107 and 108 are recommended and may be taken concurrently with 104A.
- †107. Method of Least Squares. (2) I. Mr. Einarsson
Adjustment of observations with applications to astronomy and plane and geodetic surveying.
108. Computing. (3) I. Mr. Cunningham
Theory and practice of computing. Interpolation, numerical differentiation and integration.
- †114. Practical Astronomy for Engineers. (3) I. Mr. Einarsson
Lectures, computing, and two hours of astronomical observation.
Prerequisite: course 3 and plane surveying (Engineering 1A-1B).
Precise determination of latitude, time, and longitude.
115. Introduction to Celestial Mechanics. (3) II. Mr. Cunningham
Prerequisite: course 108, Physics 105A.
- 117A-117B. Introduction to Astrophysics. (3-3) Yr. Mr. Henyey
A laboratory period will occasionally be substituted by appointment for one of the regular periods.
Prerequisite: course 7A-7B or consent of the instructor.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Mr. Henyey in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- *215A-215B. Celestial Mechanics. (3-3) Yr. Mr. Cunningham
Prerequisite: course 115.
Various orbit methods. Special perturbations. Introduction to general perturbations.
- 217A-217B. Astrophysics. (3-3) Yr. Mr. Henyey
Prerequisite: course 117A-117B.
The physics of stellar atmospheres.
- 218A-218B. Statistical Astronomy. (3-3) Yr. Mr. Trumpler
- 225A-225B. Advanced Celestial Mechanics. (3-3) Yr. Mr. Cunningham
- *227A-227B. Astrophysics. (3-3) Yr. Mr. Henyey
Prerequisite: course 117A-117B.
227A. The internal structure of stars.
227B. The physical properties of nebulae and interstellar matter.
290. Seminars. (1-3) I and II. The Staff (Mr. Trumpler in charge)
Topics in modern astronomy, selected on the basis of wide current interest. The subjects, varying from year to year, are announced at the beginning of each semester. Discussions are conducted principally by means of conferences, occasionally by means of lectures.
299. Advanced Study and Research. (1-4) I and II.
The Staff (Mr. Henyey in charge)

LICK OBSERVATORY

The Lick Observatory at Mount Hamilton forms a separate department of the University offering facilities for advanced astronomical work. The department

† To be given if a sufficient number of students enroll.

* Not to be given, 1949-1950.

is open to graduate students under regulations prescribed by the Regents. The degrees of Master of Arts and Doctor of Philosophy are offered to students who have fulfilled the required conditions. (See ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.) For information relating to graduate work at the Observatory, intending students should address the Dean of Graduate Division at Berkeley, or the Director of the Lick Observatory, Mount Hamilton, Santa Clara County, California.

BACTERIOLOGY

A. P. KRUEGER, A.B., M.D., Professor of Bacteriology (Chairman of the Department).

*MICHAEL DOUDOROFF, Ph.D., Associate Professor of Bacteriology.

SANFORD S. ELBERG, Ph.D., Associate Professor of Bacteriology.

ROGER Y. STANIER, Ph.D., Associate Professor of Bacteriology.

JACOB FONG, Ph.D., Assistant Professor of Bacteriology.

EDWARD A. ADELBERG, Ph.D., Instructor in Bacteriology.

SHIRLEY GUNTER, A.B., M.A., Associate in Bacteriology.

LUCILLE SCHULTZ, A.B., M.A., Associate in Bacteriology.



HORACE A. BARKER, Ph.D., Professor of Soil Microbiology.

JOHN H. NORTHRUP, Ph.D., Sc.D., LL.D., Visiting Professor of Bacteriology.

JOHN ENRIGHT, Ph.D., Lecturer in Bacteriology for the spring semester.

EDWIN H. LENNETTE, M.D., Lecturer in Bacteriology for the spring semester.

Letters and Science List.—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. J. FONG.

Preparation for the Major.—Required: course 1; Chemistry 1A, 1B, 5, and 8; Zoölogy 1A; Botany 1 or 12; Physics 2A, 2B, 3A, 3B. Recommended: Chemistry 9; Physiology 1, 1L; Public Health 5A, 5B; elementary courses in French or German; Mathematics 3A, 3B, 4A, 4B.

The Major.—All courses required for the major must be completed with a minimum average grade of C. Required: courses 101, 199; Biochemistry 103 and either 104 or Botany 122 and 123; and at least 12 units chosen from the following list with the approval of the department: (In special cases, substitutions may be permitted.) Courses 102, 103; Botany 101, 102, 107; Food Technology 116; Chemistry 100, 102, 109; Biochemistry 105A, 105B, 107; Zoölogy 110, 111, 140; Anatomy 101; Entomology 117, 126; Physiology 100A, 100B; Public Health 150A, 150B.

Honor Students.—Honors are recommended for candidates who maintain a grade-point average of 2.5 or higher in at least the minimum for the major in bacteriology and in other biological subjects.

LOWER DIVISION COURSES

1. Introductory Bacteriology and Microbiology. (5) II.

Lectures and laboratory.

Mr. Stanier, Miss Gunter

Prerequisite: Chemistry 1A and 8; a semester course in botany, zoölogy, or physiology (Botany 1 or 12; Zoölogy 1A or 10; Physiology 1) with at least a grade of C in each course.

A general introduction to microbiology required of students majoring in bacteriology and other students intending to do further work in microbiology.

* Absent on leave, 1949-1950.

2. General Bacteriology. (4) II. Mr. Adelberg, Miss Gunter
Lectures and laboratory.
Prerequisite: Chemistry 1A.
Designed especially for students who are not majoring in bacteriology.
4. General Bacteriology (Laboratory). (2) II.
Mr. Adelberg, Mr. Elberg, Mr. Fong, Mr. Stanier
Prerequisite: Chemistry 1A and consent of the instructor.
Laboratory instruction in the general principles of bacteriology. (For students who have had an acceptable course in bacteriology without laboratory.)
7. Survey of General Bacteriology. (3) II. Mr. Adelberg
(Formerly numbered 31.)
Lectures for course 2 and one three-hour demonstration period a week.
Prerequisite: Chemistry 1A.
Designed primarily for preoptometry students. Not acceptable as a prerequisite for upper division courses in bacteriology.

UPPER DIVISION COURSES

A grade of C or higher in the preceding courses in this department is required for admission to the upper division courses.

101. Advanced Bacteriology. (7) I. Mr. Krueger, Mr. Elberg, Mr. Fong
Lectures, demonstrations, and laboratory.
Prerequisite: course 1 or 2, Chemistry 8, Zoology 1A.
Enrollment limited to sixty-eight students who will be selected on the basis of scholastic standing, major field, and year of residence.
102. Immunology, the Dynamics of Infection and Resistance. (4) II.
Mr. Elberg, Miss Schultz
Prerequisite: course 101, Chemistry 8. A reading knowledge of French or German is recommended. Enrollment limited to twelve students.
The factors underlying the virulence of microorganisms; mechanisms of bacterial infection; specific and nonspecific reactions in antimicrobial immunity; the antigen-antibody reaction; nature and serological specificity of antibodies; immuno-chemistry of protein and nonprotein cell substances.
103. Microbial Metabolism. (2) II. Mr. Barker, Mr. Stanier
Prerequisite: course 1 or 2 and Biochemistry 103 or Botany 122.
- *104. Advanced General Microbiology. (4) I. Mr. Stanier, Miss Gunter
Prerequisite: course 1 and in addition Biochemistry 103 or Botany 122 and either Biochemistry 104 or Botany 123 or Chemistry 9. A reading knowledge of German is desirable.
A course designed primarily to acquaint the student with the laboratory techniques necessary for advanced work in general microbiology.
105. Technical Microbiology. (3) I. Mr. Stanier
Prerequisite: Chemistry 1A-1B, 8; courses 1 or 2.
Utilization and control of bacteria, yeasts, and molds in industrial processes such as brewing, vinegar production, and processing of antibiotics.
106. Introduction to the Animal Viruses. (2) II. Mr. Lennette, Mr. Enright
Prerequisite: course 101 with a grade of C or better.
An introduction to the animal viruses including the techniques of virology, inclusion bodies, pathogenesis, immunity and virus-host relationship.

* Not to be given, 1949-1950.

107. Introduction to Medical Microbiology, Parasitology, and Immunology. (4) II. The Staff (Mr. Fong in charge)
Prerequisite: course 2.
A survey course dealing with the microscopic agents responsible for infectious diseases of man. Consideration of morphology, reproduction, means of isolation, identification and typing, pathogenesis and immunology, cycles and vectors.
199. Special Study for Advanced Undergraduates. (2-4) I and II.
Mr. Elberg, Mr. Fong, Mr. Stanier

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 163)
201. Special Study and Research. I and II. Credit according to the work completed. Mr. Adelberg, Mr. Barker, Mr. Elberg, Mr. Krueger, Mr. Fong, Mr. Stanier
202. Seminar in General Bacteriology. (1) I and II.
The Staff (Mr. Stanier in charge, fall semester;
Mr. Elberg in charge, spring semester)
Prerequisite: course 199 or consent of the instructor.
Subjects will vary from year to year and will be announced at the beginning of each semester.
Required of all beginning graduate students.
203. Seminar on Microbiological Metabolism. (1) I and II. Mr. Stanier
Prerequisite: course 202 or consent of the instructor.
204. Seminar in Medical Microbiology. (1) I and II. Mr. Elberg, Mr. Fong
Prerequisite: course 202 or consent of the instructor.
205. Seminar in Immunology. (1) I and II. Mr. Elberg
Prerequisite: course 204 and consent of the instructor.
206. Seminar in Experimental Pathology. (1) I and II. Mr. Krueger
Prerequisite: course 204 and consent of the instructor.

BIOCHEMISTRY

(Including a Division of the Medical School)

DAVID M. GREENBERG, Ph.D., Professor of Biochemistry.

PAUL L. KIRK, Ph.D., Professor of Biochemistry.

WENDELL M. STANLEY, Ph.D., Sc.D., LL.D., Docteur h.c. (Paris), Professor of Biochemistry (Chairman of the Department) and Director of the Virus Laboratory.

EDWARD S. SUNDSTROM, M.D., Professor of Biochemistry, Emeritus.

¹FRANK W. ALLEN, Ph.D., Associate Professor of Biochemistry.

C. ARTHUR KNIGHT, Ph.D., Associate Professor of Biochemistry.

FRED H. CARPENTER, Ph.D., Assistant Professor of Biochemistry.

EDWARD L. DUGGAN, Ph.D., Assistant Professor of Biochemistry.

HAROLD TARVER, Ph.D., Assistant Professor of Biochemistry.

MAX SCHLAMOWITZ, Ph.D., Instructor in Biochemistry.



HAMILTON H. ANDERSON, M.D., Professor of Pharmacology.

HERMANN O. L. FISCHER, Ph.D., Lecturer in Biochemistry.

CHOH H. LI, Ph.D., Associate Professor of Experimental Biology.

¹ In residence fall semester only, 1949-1950.

ARTHUR B. PARDEE, Ph.D., Instructor in Biochemistry, Virus Laboratory.
 HOWARD K. SCHACHMAN, Ph.D., Instructor in Biochemistry, Virus Laboratory.

Letters and Science List.—All undergraduate courses in biochemistry are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Alternate programs may be selected for the undergraduate major: Plan I, a program for general undergraduate students and Plan II, a program for students who intend later to become candidates for the degree of M.A. or Ph.D. in biochemistry.

Departmental Major Adviser: Mr. FRANK W. ALLEN.

Plan I. The program for the general undergraduate is as follows:

Preparation for the Major.—Required: Chemistry 1A-1B, 5, and 8; Physics 2A-2B, 3A-3B; Physiology 1, 1L or Zoölogy 1A-1B. Recommended: Chemistry 9, 109, Bacteriology 1, 4, Botany 12.

The Major.—The major must include courses 103 (4), 104 (4), 110 (5), 112 (1), and the balance of the 24 units required for the major chosen in accordance with a plan approved by the departmental adviser.

Ordinarily, no student will be accepted as a major student in biochemistry who has not attained at least a C average in the required courses in chemistry, nor will he be permitted to continue as a major student in biochemistry unless he receives at least a C grade in courses 103 and 104 or 101M.

Plan II. The program for the undergraduate expecting to pursue graduate study in biochemistry is as follows:

Preparation for the Major.—Required: Chemistry 1A-1B, 5, 12A-12B and 109 or 110A-110B; Physics 2A-2B, 3A-3B; Mathematics 3A-3B, 4A; Physiology 1, 1L or Zoölogy 1A-1B. Recommended: Bacteriology 1 and 4; Botany 12; a reading knowledge of German; a course in statistics.

The Major.—The major consists of 24 units of upper division courses in biochemistry and allied subjects taken in accordance with a plan approved by the departmental adviser. Normally at least 20 units of the major must be in courses in biochemistry and must include courses 103 (4), 104 (4), 110 (5), and 112 (1). It is expected that a student pursuing Plan II will maintain a grade-point average of at least 2 in biochemistry courses.

UPPER DIVISION COURSES

101M. Medical Biochemistry. (8) II. Mr. Greenberg, Mr. Tarver
 Prescribed for students in the first year of the Medical School to fulfill the requirements in biochemistry.

Lectures on the physicochemical basis of life processes, a survey of the chemical nature of lipids, carbohydrates, proteins, vitamins, and hormones, a discussion of the changes that these substances undergo in the animal body, and a general survey of the field of nutrition and energy exchange.

Laboratory practice in routine biochemical procedures including urine and blood analyses.

103. Animal Biochemistry. Lectures only. (4) II.

Mr. Carpenter, Mr. Duggan, Mr. Schlamowitz
 Prerequisite: Chemistry 8 with a grade of C or higher. Recommended: Chemistry 5, Zoölogy 1A-1B or Physiology 1, 1L, Anatomy 102.

Lectures on the chemical factors concerned in life processes including the chemistry and metabolism of salts, vitamins, hormones, lipids, carbohydrates, and proteins together with a survey of nutrition and energy exchange.

The student is advised to take courses 103 and 104 simultaneously if possible.

104. Animal Biochemistry. Laboratory only. (4) II. Mr. Duggan
Prerequisite: course 103, completed or in progress, and Chemistry 5 or Home Economics 101A, with a grade of C or higher.
Laboratory practice with the more important constituents of living matter to illustrate their chemical behavior.
- 105A. The Chemistry of the Proteins. (3) I. Mr. Greenberg
Prerequisite: Chemistry 8 with a grade of C or higher. Recommended: Chemistry 109 or 110A-110B.
Chemical constitution, methods of analysis, synthesis, isolation, and behavior of amino acids and proteins. The role which these substances play in life processes.
- 105B. The Biochemistry of Enzyme Action and Biological Oxidation. (3) II. Mr. Greenberg
Prerequisite: course 105A with a grade of C or higher or consent of the instructor. Recommended: Chemistry 109 or 110A-110B.
Classification, sources, methods of purification, physicochemical properties, and mechanism of action of enzymes and their role in metabolic processes.
- 106A. Protein Chemistry Laboratory. (3) I. Mr. Pardee
Prerequisite: course 105A in progress or completed, and Chemistry 5. The preparation and isolation of amino acids and proteins. Methods of analysis, physicochemical properties, and behavior.
- 106B. Enzyme Chemistry Laboratory. (3) II. Mr. Schlamowitz
Prerequisite: course 106A or consent of the instructor.
Experimental methods of enzyme chemistry and biological oxidations.
107. Quantitative Microchemical Analysis. (4) I. Mr. Kirk
Lecture and laboratory.
Prerequisite: Chemistry 5, 8, and 9, with a grade of C or higher and consent of the instructor. Enrollment limited to twenty-five.
Quantitative estimation of elements and compounds on a micro basis with particular reference to biological materials.
108. Qualitative Microchemical Analysis. (3-5) II. Mr. Kirk
Lecture and laboratory.
Prerequisite: Chemistry 5, 8, and 9, with a grade of C or higher and consent of the instructor. Enrollment limited to twenty-five.
Application of chemical microscopy and microqualitative methods to inorganic and organic substances. Criminological testing methods.
109. Advanced Microchemical Analysis. (2-4) I and II. Mr. Kirk
Lecture and laboratory.
Prerequisite: course 107 or 108 with grade of B or higher, or consent of the instructor.
A limited number of students may pursue advanced microchemical techniques and special problems.
110. Advanced Biochemistry. (5) I. Mr. Allen
Lectures and laboratory.
Prerequisite: courses 101M, or 103 and 104, with a grade of C or higher.
Lectures and laboratory work appertaining to blood analysis, respiratory gas analysis, and other methods that are used in clinical laboratories and that illustrate normal and abnormal life processes.
112. Proseminar. (1) I and II. The Staff (Mr. Greenberg in charge)
Prerequisite: courses 103, 104, and 110, with a grade of C or higher.
Biochemical literature and newer developments of the subject.

- *180. Research. (3-5) I and II. The Staff (Mr. Greenberg in charge)
Prerequisite: completion of the following courses in biochemistry with an average grade of B or higher: 103, 104 (or 101M) and 110; or 105A, 105B, and 106A-106B.
A limited number of selected students will be given topics for investigation under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-2) I and II.
The Staff (Mr. Greenberg in charge)
Reading and conference for properly qualified students under the direction of a member of the staff.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Courses 201 to 208 represent selected topics in biochemistry. Intended to acquaint advanced students with recent advances made in the different fields of biochemistry. Open to senior students with honor standing by consent of the instructor.

201. Protein Metabolism. (2) I. Mr. Tarver
Survey of the intermediate metabolism of amino acids and proteins.
202. Carbohydrates. (2) I. Mr. Fischer
Chemistry and biochemistry of the carbohydrates.
203. Biochemistry of the Hormones. (2) II. Mr. Li
Survey of the biochemistry of the hormones.
204. Biochemistry of the Viruses. (2) II. Mr. Knight
Survey of the biochemistry of the viruses.
- *205. Biochemistry of Cancer. (2) I. Mr. Greenberg
Survey of the biochemistry of neoplastic growth, tumors, and the tumor-bearing host.
206. Physical Biochemistry. (2) II. Mr. Schachman, Mr. Gofman
Prerequisite: Chemistry 8, 109, Physics 4A, 4B, 4C, Mathematics 3A or consent of instructor. Recommended: Chemistry 12A, 12B, 110A, 110B, courses 103, 105A.
Application of modern physical concepts and experimental methods to the problems of large molecules of biological interest.
- *207. The Mechanism of Drug Action. (2) I. Mr. Anderson, Mr. Abreu
(Formerly numbered 115.)
The composition, synthesis, biochemical and pharmacological properties and action of chemical agents that are used in medicine; relation between chemical composition and pharmacological action; principles of chemotherapy.
- *208. The Mechanism of Drug Action. Laboratory. (1) I.
(Formerly numbered 116.) Mr. Anderson, Mr. Abreu
Prerequisite: course 207 or an equivalent course in pharmacology.
Intended to serve as an introduction to research in the borderline field between biochemistry and pharmacology.
212. Graduate Seminar. (1) I and II. The Staff (Mr. Stanley in charge)
Prerequisite: completion of the major in biochemistry.
280. Research in Biochemistry. (1-9) I and II.
The Staff (Mr. Stanley in charge)
Not less than 4 units except by special permission of the chairman of the department.

* Not to be given, 1949-1950.

299. Special Study for Graduate Students. (1-3) I and II.

The Staff (Mr. Stanley in charge)

Reading and conference for properly qualified graduate students under the direction of a member of the staff.

Research Conference. (No credit) I and II.

The Staff (Mr. Stanley in charge)

Members of the staff and advanced graduate students meet once a week to discuss research problems.

RELATED COURSES IN OTHER DEPARTMENTS

Anatomy 101 (6), 102 (3).

Bacteriology 101 (6), 103 (2).

Botany 122 (2), 123 (2).

Chemistry 100 (3), 101 (3), 102 (3), 103 (3) 104 (3), 109 (3), 110A-110B (6), 111 (3), 114H (3).

Home Economics 118A (4), 118B (5).

Physiology 100A-100B (6), 104A (2), 106 (2), 110A-110B (6), 112 (3).

Soil Science 114 (3).

Zoölogy 100 (4), 101 (2), 102 (2), 106 (4), 107 (2), 114 (3), 121 (2).

BOTANY

LEE BONAR, Ph.D., Professor of Botany and Curator of Mycological Collections (Chairman of the Department).

LINCOLN CONSTANCE, Ph.D., Professor of Botany and Curator of Seed Plant Collections.

ALVA R. DAVIS, Ph.D., Professor of Plant Physiology.

ADRIANCE S. FOSTER, Sc.D., Professor of Botany.

²THOMAS H. GOODSPEED, Ph.D., Doctor (hon.c.) (La Plata), Sc.D (hon.c.), Professor of Botany and Director of the Botanical Garden.

HERBERT L. MASON, Ph.D., Professor of Botany and Director of the Herbarium.

HOWARD S. REED, Ph.D., Professor of Plant Physiology, Emeritus.

RALPH EMERSON, Ph.D., Associate Professor of Botany.

¹GEORGE F. PAFENFUSS, Ph.D., Associate Professor of Botany and Curator of Algal Collections.

LEONARD MACHLIS, Ph.D., Assistant Professor of Plant Physiology.

JOHANNES M. PROSKAUER, Ph.D., Instructor in Botany.

JOHN G. TORREY, Ph.D., Instructor in Botany.



JAMES P. BENNETT, Ph.D., Professor of Plant Physiology.

WILLIAM Z. HASSID, Ph.D., Professor of Plant Nutrition.

GORDON MACKINNEY, Ph.D., Professor of Food Technology.

EMIL M. MRAK, Ph.D., Professor of Food Technology.

WILLIAM C. SNYDER, Ph.D., Professor of Plant Pathology.

DANIEL I. ARNON, Ph.D., Associate Professor of Plant Nutrition.

PAUL K. STUMPF, Ph.D., Assistant Professor of Plant Nutrition.

LOUIS JACOBSON, Ph.D., Assistant Professor of Plant Nutrition.

JOHN A. RATTENBURY, M.A., Lecturer in Botany.

¹ In residence fall semester only, 1949-1950.

² In residence spring semester only, 1949-1950.

Letters and Science List.—All undergraduate courses in botany are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. PAPPENFUSS.

Preparation for the Major.—Required: course 1 and Chemistry 1A, 8. If the lower division program is crowded, the student may postpone Chemistry 8 until he reaches the upper division, provided it is taken before courses 111, 122, 123. Recommended: German and one other foreign language; elementary courses in other biological sciences.

The Major.—The courses in botany are organized on levels of increasing specialization corresponding to the elementary, intermediate, and the advanced stages of instruction. Requirements for the major are: the elementary course, Botany 1; the intermediate courses, Botany 14, 15, 16, 108, and 111; and advanced botany courses amounting to an additional 10 units.

LOWER DIVISION COURSES

1. General Botany. (5) I.

Mr. Constance, Mr. Machlis, Mr. Proskauer, Mr. Torrey

Lectures and laboratory.

An introduction to the fundamental principles of biology as illustrated by plants, with emphasis on the morphology, physiology, and phylogenetic relations of the major plant groups.

Designed as the basic course in botany for all students of plant or animal science. Not open to students who have completed course 12.

12. Introduction to the Structure and Function of Plants. (4) II.

Mr. Emerson, Mr. Machlis, Mr. Proskauer

Lectures and demonstration periods. Designed primarily for students who desire a general acquaintance with the fundamentals of botany. Not a substitute for course 1. Not open to students who have completed course 1.

14. Structure and Reproduction of the Thallophytes. (4) II.

Lectures and laboratory.

Mr. Bonar, Mr. Proskauer

Prerequisite: course 1.

*15. Comparative Morphology of the Bryophytes and Lower Vascular Plants. (4) II.

Lectures and laboratory.

Prerequisite: course 1.

16. Comparative Morphology of Vascular Plants. (4) I.

Mr. Foster

Lectures and laboratory.

Prerequisite: course 1.

RELATED COURSES IN OTHER DEPARTMENTS

General Paleontology. (Paleontology 1.)

General Bacteriology and Microbiology. (Bacteriology 2.)

UPPER DIVISION COURSES

In addition to requirements specifically noted, the prerequisite for all upper division courses is course 1.

Morphology and Taxonomy

101. Mycology. (4) II.

Mr. Emerson

Prerequisite: course 14.

The structure and development of the fungi. Myxomycetes, Phycomycetes, and Ascomycetes. Lectures and laboratory.

* Not to be given, 1949-1950.

102. Mycology. (4) I. Mr. Bonar
Lectures and laboratory.
Prerequisite: course 14. Course 101 recommended but not required.
Fungi Imperfecti and Basidiomycetes.
105. Plant Anatomy. (4) II. Mr. Foster
Lectures and laboratory.
Prerequisite: course 16 and consent of the instructor.
Comparative structure and growth of the meristems; development and structure of important cell types, tissues, and tissue systems; comparative anatomy of stem, root, and leaf. Emphasis is placed upon the anatomy of gymnosperms and angiosperms.
- *107. Algology. (4) II. Mr. Papenfuss
Lectures and laboratory.
Prerequisite: course 14.
Advanced morphology and taxonomy of algae.
108. Taxonomy of Seed Plants. (4) II. Mr. Constance
Lectures, laboratory, and field work.
A survey of the spermatophytes, with lectures on phylogeny and classification; laboratory and field work with collection and identification practice.
- 110A. Phylogenetic Taxonomy. (3) I. Mr. Mason
Lectures and laboratory.
Prerequisite: courses 16, 108.
Analysis of morphological problems fundamental to the systems of classification, with laboratory work on selected problems in morphology.
- 110B. Phylogenetic Taxonomy. (3) II. Mr. Mason
Lectures and laboratory.
Prerequisite: course 110A and Genetics 100.
An introduction to population studies and experimental and other research methods applicable to taxonomy.

RELATED COURSES IN OTHER DEPARTMENTS

- Plant Diseases (Agriculture: Plant Pathology 120).
Technique of Plant Pathology (Agriculture: Plant Pathology 121).
Advanced Paleobotany (Paleontology 120).
Yeasts and Related Organisms (Agriculture: Food Technology 116).
Microbial Metabolism (Bacteriology 103).
Soil Microbiology (Agriculture: Soil Science 111).
Wood Technology (Forestry 114).

Plant Physiology and Plant Biochemistry

111. Elementary Plant Physiology. (4) II. Mr. Machlis, Mr. Torrey
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8.
- *120A. Advanced Plant Physiology. (2) I. _____
Prerequisite: course 111, Chemistry 1A and 8, or their equivalents. Recommended: course 122, Chemistry 5, and Soil Science 110. If possible, course 121A should be taken concurrently.
- *120B. Advanced Plant Physiology. (2) II. _____
Prerequisite: course 120A. If possible, course 121B should be taken concurrently. A continuation of course 120A.

* Not to be given, 1949-1950.

- *121A. Plant Physiology. Laboratory. (2) I. _____
Prerequisite: course 111, Chemistry 1A and 8, or their equivalents;
course 120A should be taken concurrently. Recommended: courses 105, 122,
123, Chemistry 5.
- *121B. Plant Physiology. Laboratory. (2) II. _____
Prerequisite: course 111, Chemistry 1A and 8, or their equivalents;
course 120B should be taken concurrently. Recommended: courses 105,
121A, 122, 123, Chemistry 5.
122. Plant Biochemistry. (2) I. _____ Mr. Stumpf
Prerequisite: Chemistry 8. Whenever possible, course 123 should be
taken concurrently.
123. Plant Biochemistry. Laboratory. (2) I. _____ Mr. Hassid, Mr. Jacobson
Prerequisite: course 122 (concurrently), Chemistry 5, 8.

RELATED COURSES IN OTHER DEPARTMENTS

- Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 121, 122).
Soils as a Medium for Plant Growth (Agriculture: Soil Science 110, 112).
Principles of Forest Ecology (Forestry 103).
Properties of Colloids (Agriculture: Soil Science 114).
Mineral Nutrition of Plants (Agriculture: Soil Science 115).
General Ecology (Zoölogy 125).

Cytology and Genetics

130. Plant Cytology. (4) I. _____ Mr. Rattenbury
Lectures and laboratory.
Anatomy and physiology of the cell.

RELATED COURSES IN OTHER DEPARTMENTS

- Principles of Genetics (Agriculture: Genetics 100).
Cytogenetics (Agriculture: Genetics 101, 101C).
Advanced Genetics (Agriculture: Genetics 102).
Organic Evolution (Agriculture: Genetics 103).
Technique of Plant Pathology (Agriculture: Plant Pathology 121).
Microscopic Technique (Zoölogy 4).
Cytology (Zoölogy 107, 107C).
Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 121, 122).
Genetics (Zoölogy 114).
Methods of Biological Investigation with Optical Instruments of Precision
(Zoölogy 119A-119B).

General Courses

150. History of Botany. (3) II. _____ Mr. Goodspeed
Lectures, discussions, and reports.
Open to students with upper division standing in botany and major
students in other biological sciences with the approval of the instructor.
151. Principles of Plant Distribution. (3) I. _____ Mr. Mason
Open to students with upper division standing in botany and major
students in other biological sciences with the approval of the instructor.

155. Botanical Microtechnique. (2) II. Mr. Foster
Prerequisite: courses 105 and 130, or their equivalents and consent of the instructor.
Special techniques in the processing of plant material for histological and cytological study.
- 199A-199B. Special Study for Advanced Undergraduates. (1-4; 1-4) Yr. The Staff (Mr. Bonar in charge)
Open to specially qualified seniors with the approval of the instructor.

RELATED COURSES IN OTHER DEPARTMENTS

- Tertiary Floras of Western America (Paleontology 121).
Principles of Forest Ecology (Forestry 103).
History of Biology (Zoölogy 117).
Geography of Domesticated Plants and Animals (Geography 161).

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 163)
- 201A-201B. Research. Yr. The Staff (Mr. Foster in charge)
Original investigations of special problems in the field, laboratory, herbarium, or botanical garden. Credit according to the work accomplished.
203. Seminar in Plant Physiology. (1) II. Mr. Machlis, Mr. Torrey
204. Seminar in Plant Cytology. (1) II. Mr. Goodspeed
205. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.
(Formerly numbered 205A.) Mr. Constance, Mr. Mason, Mr. Foster

BUSINESS ADMINISTRATION

- IRA B. CROSS, Ph.D., Professor of Economics on the Flood Foundation.
WILLIAM L. CRUM, M.A., Sc.D. (hon.), Ph.D., Professor of Economics.
STUART DAGGETT, Ph.D., Professor of Transportation on the Flood Foundation.
- MALCOLM M. DAVISSON, J.D., Ph.D., Professor of Economics.
ROBERT A. GORDON, Ph.D., Professor of Economics.
EWALD T. GREYER, Ph.D., Professor of Economics on the Flood Foundation
(Chairman of the Department of Business Administration).
CLARK KERR, Ph.D., Professor of Industrial Relations.
- †PERRY MASON, Ph.D., C.P.A., Professor of Accounting.
LEONARD A. DOYLE, Ph.D., C.P.A., Associate Professor of Accounting.
ROY W. JASTREAM, Ph.D., Associate Professor of Business Administration.
FRANK L. KIDNER, Ph.D., Associate Professor of Economics.
MAURICE MOONITZ, Ph.D., C.P.A., Associate Professor of Accounting.
STEFAN PETERS, Ph.D., Associate Professor of Insurance and Lecturer in Mathematics.
- DAVID A. REVZAN, Ph.D., Associate Professor of Business Administration.
†ROYAL A. ROBERTS, M.B.A., Associate Professor of Business Administration.
*ARTHUR M. ROSS, Ph.D., Associate Professor of Business Administration.
WILLIAM K. SCHMELZLE, M.B.A., Ph.D., Associate Professor of Business Administration.
- CHARLES C. STAEBLING, M.S., C.P.A., Associate Professor of Accounting.
LAWRENCE L. VANCE, Ph.D., C.P.A., Associate Professor of Accounting.

† Sabbatical leave in residence, 1949-1950.

* Absent on leave, 1949-1950.

† In residence fall semester only, 1949-1950.

- PAUL F. WENDT, Ph.D., Associate Professor of Finance.
 PHILIP B. BERGFELD, J.D., Assistant Professor of Commercial Law.
 JOHN P. CARTER, Ph.D., Assistant Professor of Business Administration.
 NEIL T. HOUSTON, M.A., Ph.D., Assistant Professor of Business Administration.
- VAN DUSEN KENNEDY, Ph.D., Assistant Professor of Industrial Relations.
 SHERMAN J. MAISEL, M.P.A., Ph.D., Assistant Professor of Business Administration.
- CATHARINE DE MOTTE QUIRE, Ph.D., Assistant Professor of Accounting.
 WERNER Z. HIRSCH, Ph.D., Instructor in Economics.
 DOW VOTAW, M.B.A., LL.B., Instructor in Commercial Law.
 HAROLD FURST, M.B.A., Associate in Business Administration.
 ELDON S. HENDRIKSEN, M.B.A., Associate in Accounting.
 GEORGE L. MOSS, M.B.A., Associate in Accounting.
 HARRY R. SIMMONS, M.B.A., Associate in Accounting.
 JOHN R. SUMMERFIELD, M.B.A., Associate in Business Administration.
- ◊
- DAVID A. ALHADEFF, M.A., Lecturer in Business Administration.
 DONALD A. CORBIN, M.B.A., C.P.A., Lecturer in Accounting.
 DONALD A. FERGUSSON, M.B.A., Lecturer in Finance.
 LESLIE FISHMAN, A.B., Lecturer in Business Administration.
 VARDEN FULLER, Ph.D., Lecturer in Agricultural Economics.
 RONALD W. HAUGHTON, M.A., Lecturer in Business Administration.
 JOHN P. HOLLAND, JR., B.S., C.P.C.U., Lecturer in Business Administration.
 OLOF LUNDBERG, C.P.A., Lecturer in Accounting.
 F. THEODORE MALM, Ph.D., Lecturer in Business Administration.
 FREDERICK T. MOORE, M.A., Lecturer in Economics.
 FREDERIC P. MORRISSEY, M.Com., Lecturer in Business Administration.
 CHARLES R. RINGO, M.S., LL.B., C.P.A., Lecturer in Business Administration for the fall semester.
 FRANKLIN C. STARK, J.D., Lecturer in Commercial Law.
 PETER O. STEINER, M.A., Lecturer in Business Administration.

The requirements for the curriculum in the School of Business Administration are listed on page 000.

Letters and Science List.—Courses 1A, 1B, 10, 100, and 150 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

LOWER DIVISION COURSES

- 1A-1B. Principles of Accounting. (3-3) Yr. Beginning each semester.
 Mr. Corbin, Mr. Hendriksen, Mr. Moonitz, Mr. Simmons
 (Formerly numbered 6A-6B.)
 Two lectures and one two-hour laboratory section weekly to be arranged.
 Prerequisite: at least sophomore standing. 1A is a prerequisite to 1B.
 It is recommended that students who plan to enter the School of Business Administration complete this course in their sophomore year.
10. General Accounting. (3) I and II. Mrs. Quire
 Open to sophomore students in all departments of the University except those who are planning to take course 1A-1B.
 A survey of accounting principles and procedures, particularly as they affect the individual.
18. Commercial Law. (3) I and II. Mr. Bergfeld, Mr. Votaw
 Prerequisite: at least sophomore standing. Prescribed for students in the School of Business Administration.

UPPER DIVISION COURSES

Prerequisite: Economics 1A-1B, 2, and junior standing except where special provision has been made for students in certain curricula.

100. Economics of Enterprise. (3) I and II.

Mr. Carter, Mr. Doyle, Mr. Fishman, Mr. Houston, Mr. Jastram,
Mr. Maisel, Mr. Moore, Mr. Morrissey, Mr. Steiner

(Formerly numbered 107.)

Not open to students taking Economics 100A. Primarily for juniors.

101. Business Fluctuations and Forecasting. (3) I and II.

Mr. Alhadeff, Mr. Carter, Mr. Fergusson, Mr. Fishman, Mr. Maisel
(Formerly numbered 108.)

Prerequisite: course 100.

Not open to students who have taken Economics 100B.

105. Advanced Commercial Law. (3) I and II.

(Formerly numbered 118.) Mr. Bergfield, Mr. Stark, Mr. Votaw

Prerequisite: course 18.

Administrative and constitutional law; business organization, including partnerships, corporations, and agency; creditors' rights; financing sales transactions (problems in connection with conditional sales contracts, trade acceptances, and letters of credit).

106. Real Estate Law. (3) I.

Mr. Bergfield

(Formerly numbered 183.)

Prerequisite: course 180.

A survey of the historical development of the law of real property; types of estates in land; provisions of constitutional, statutory, and common law and equity affecting real estate, and the relationship between real estate brokers, agents, and the public.

121A-121B. Advanced Accounting. (3-3) Yr. Beginning each semester.

Mr. Doyle, Mr. Moonitz, Mr. Staehling

(Formerly numbered 160A-160B.)

A two-hour laboratory period to be arranged. Prerequisite: course 1A-1B with average grade not lower than C. Course 121A with at least a C average is prerequisite to course 121B.

122. Cost Accounting. (3) I and II.

Mr. Vance

(Formerly numbered 161.)

Lectures, and a two-hour laboratory period to be arranged.

Prerequisite: course 1A-1B with an average grade not lower than C.

Recommended: course 121A.

123. Auditing. (3) I and II.

Mr. Vance

(Formerly numbered 162.)

Lectures, and a two-hour laboratory period to be arranged.

Prerequisite: courses 1A-1B, 121A with a grade of at least C. Completion of 121B strongly recommended.

124. Budgetary Control and Accounting Systems. (3) I and II. Mr. Vance

(Formerly numbered 163.)

Prerequisite: courses 121A-121B, 122.

125. Governmental and Institutional Accounting. (2) I and II.

(Formerly numbered 164.)

Mr. Lundberg

Prerequisite: course 121A-121B, or consent of the instructor.

126. Analysis of Financial Statements. (3) I and II.

Mr. Staehling

(Formerly numbered 166.)

Lectures, and a two-hour laboratory period to be arranged.

Prerequisite: course 121A-121B with at least a C average and consent of the instructor.

131. Corporation Finance. (3) I and II.
 Mr. Crum, Mr. Fergusson, Mr. Morrissey, Mr. Wendt
 (Formerly numbered 134.)
 Prerequisite: course 1A-1B.
 The corporation as one form of business organization; financial aspects of promotion and organization, operation as a going concern, expansion and consolidation, failure and reorganization; the capital market, financial instruments and institutions; public regulation of security issues and security exchanges.
133. Investments. (3) I and II. Mr. Wendt
 Prerequisite: course 131.
135. Economics of Insurance. (3) I and II. Mr. Peters
 (Formerly numbered Economics 143.)
 An introduction to the underlying principles of insurance followed by a descriptive study of the practices in the more important branches of the insurance business.
136. Life Insurance. (3) I. Mr. Peters
 (Formerly numbered 144.)
 Prerequisite: course 135.
 A nontechnical study of principles and practice.
137. Property Insurance. (3) II. Mr. Holland
 (Formerly numbered 145.)
 Prerequisite: course 135.
138. Casualty Insurance. (3) I and II. Mr. Holland, Mr. Peters
 (Formerly numbered 146.)
 I: Mr. Holland; II: Mr. Peters.
 Prerequisite: course 135.
142. Production Planning and Control. (3) I and II.
 (Formerly numbered 127.) Mr. Schmelzle, Mr. Summerfield
 Prerequisite: course 190. Recommended: course 145.
 Production planning and budgeting; development of the production control system, including product development, materials control, plant and equipment analysis, production standards and methods, personnel and supervision; control of production quantity through routing, scheduling, and dispatching; quality control—inspection and statistical quality control; measurement of production efficiency.
145. Industrial Procurement. (3) II. _____
 (Formerly numbered 128.)
 Prerequisite: course 160.
 The problems met in purchasing by industrial organizations. A study of major buying policies, the sources of material, the quantity and quality needed, and the relation to price and production cost. Inspection, inventory control, storage, and reciprocal buying are subjects for oral discussion and for the study of executive report writing.
150. Industrial Relations. (3) I and II. Mr. Kennedy, Mr. Kerr
 (Formerly numbered 151.)
 Students will not receive credit for both Economics 150 and course 150. Background of the problems faced by management in the field of industrial relations and labor legislation with an introduction to personnel administration.
151. Personnel Administration. (3) I and II. Mr. Malm
 (Formerly numbered 153.)
 Prerequisite: course 150 or Economics 150, or consent of the instructor.

152. Collective Bargaining Systems. (3) I and II.
 (Formerly numbered 154.) Mr. Fuller, Mr. Kennedy, Mr. Kerr
 Prerequisite: course 150 or Economics 150.
 The nature, instrumentalities, and structure of collective bargaining. Analysis of union agreement provisions and their economic and political significance. Bargaining experience in major industries. Determinants of peace and conflict in industrial relations.
153. Labor Law. (3) I and II. Mr. Davisson
 (Formerly numbered 155.)
 Prerequisite: course 150 or Economics 150, and course 152.
 A study of federal and state laws and court decisions affecting hours, wages, strikes, boycotts, picketing, union recognition and operation, legality of collective agreements, etc. A discussion of the National Labor Relations Act, Fair Labor Standards Act, and other legislation.
160. Marketing. (3) I and II. Mr. Hirsch, Mr. Houston, Mr. Revzan
 (Formerly numbered 123.)
 The evolution of markets and marketing; market structure, organization and behavior; marketing functions; pricing and price policy; marketing problems of producers of raw materials, agriculturists, manufacturers, wholesalers and retailers; marketing costs and efficiency; public and private regulations.
- 162A-162B. Retail Store Management. (3-3) Yr. Mr. Roberts, _____
 (Formerly numbered 124A-124B.)
 162A: Mr. Roberts; 162B: _____.
 Prerequisite: course 160.
163. Advertising. (3) I. Mr. Roberts
 (Formerly numbered 125.)
 Prerequisite: course 160.
 The basic concepts of advertising dealing with the preparation and execution of copy for various types of media. Study of the English used in advertising, illustration, and other elements of copy. The evaluation of principal types of media. Study of underlying psychology in copy and the psychology of the consumer as developed through product and market research.
164. Advertising Policy. (3) II. Mr. Jastram
 (Formerly numbered 129.)
 Prerequisite: courses 100, 160, 163, or consent of the instructor.
 Executive consideration of advertising in relation to price policy and the competitive problems of the firm.
165. Sales Analysis and Sales Management. (3) I and II. Mr. Roberts, _____
 (Formerly numbered 126.)
 I: Mr. Roberts; II: _____.
 Prerequisite: course 160.
173. Air Transportation. (3) I. Mr. Carter
 A survey of civil aviation: physical characteristics of aircraft, airports, and airways; government aviation agencies; air-carrier operations, services, rates, costs and finances; airport management; legal problems arising from the use of the airspace; international air transport; evaluation of employment opportunities.
174. Traffic Management. (3) I and II. Mr. Daggett
180. Introduction to Real Estate and Urban Land Economics. (3) I and II.
 I: Mr. Wendt; II: Maisel. Mr. Maisel, Mr. Wendt
 The nature of real property; the principles of urban land utilization; classification of property rights; urban development; real property valua-

tion; the real estate market and its functions; the organization of the real estate business; government regulation of real estate practices.

181. Valuation of Real Property. (3) II. Mr. Wendt
Prerequisite: course 180.
The concepts, methods, and principles of land valuation; the factors influencing real estate values and income; trends in real property values and appraisal procedures in the urban real estate market.
185. Foreign Exchange. (3) I. Mr. Cross
(Formerly numbered 136.)
Prerequisite: Economics 135.
190. Business Organization and Management. (3) I and II.
Mr. Furst, Mr. Schmelzle, Mr. Summerfield
(Formerly numbered 120.)
Primarily for juniors.
An introduction to the organization and management of business enterprises; the internal organization of the business units; the management of physical resources; personnel administration; the management of sales and production operations; administrative controls.
191. Management Problems and Policies. (3) I and II. ———
(Formerly numbered 121.)
Prerequisite: senior standing and courses 100, 160, 190. Recommended: courses 131, 150.
- 198A-198B. Directed Group Study. (1-3; 1-3) Yr.
The Staff (Mr. Grether in charge)
- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr.
The Staff (Mr. Grether in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

221. Advanced Accounting Problems. (3) I and II.
(Formerly numbered 261A.) Mr. Moonitz, Mr. Staehling
I: Mr. Moonitz; II: Mr. Staehling.
Prerequisite: courses 121A-121B, 122.
222. Advanced Cost Accounting. (3) I and II. Mr. Doyle
(Formerly numbered 261B.)
Prerequisite: courses 121A-121B, 122.
- *226. Specialized Accounts. (2) I. Mr. Vance
(Formerly numbered 264.)
228. Income Tax Procedure. (3) I and II. Mr. Mason, Mr. Ringo
(Formerly numbered 269.)
I: Mr. Ringo; II: Mr. Mason.
Prerequisite: course 121A-121B.
A study of the federal and California laws relating to personal, estate, and corporation income taxes, from the accounting point of view, including a brief survey of social security, gift, and state taxes.
- 229A-229B. Seminar in Accounting Theory. (3-3) Yr.
(Formerly numbered 260A-260B.) Mr. Mason, Mr. Moonitz
229A: Mr. Mason; 229B: Mr. Moonitz.
Prerequisite: course 121A-121B.
- *230. Seminar in Money and Credit. (3) II. Mr. Cross
(Formerly numbered 236.)
Prerequisite: course 185 and Economics 135.

* Not to be given, 1949-1950.

234. Problems of Business Finance. (3) I and II. Mr. Crum
- *239. Seminar in Insurance. (3) I.
(Formerly numbered 243.)
256. Administration of Wage Contracts and Dispute Settlement. (3) I.
Prerequisite: courses 150 and 152. Mr. Houghton
259. Seminar in Industrial Relations. (3) II. Mr. Kerr
(Formerly numbered 251.)
260. Advanced Marketing. (3) I and II. Mr. Revzan
(Formerly numbered 226.)
Prerequisite: course 160 and graduate standing.
Readings, case, problem, and special report work. Intended primarily for graduate students in business administration who are candidates for the professional M.B.A. degree but are not qualified for course 269A-269B.
- 269A-269B. Seminar in Marketing. (3-3) Yr. Mr. Grether
(Formerly numbered 223A-223B.)
279. Seminar in Transportation. (2) I. Mr. Daggett
(Formerly numbered 270A.)
290. Business Investigations and Analysis. (3) I and II. Mr. Revzan
(Formerly numbered 242.)
298. Seminar in Business Policy. (3) I and II. Mr. Schmelzle
(Formerly numbered 221.)
299. Research in Business Problems. (1-6) I and II.
(Formerly numbered 297.) The Staff (Mr. Grether in charge)
Primarily for candidates for the degree of Master of Business Administration.

CHEMISTRY AND CHEMICAL ENGINEERING

- GERALD E. K. BRANCH, Ph.D., Professor of Chemistry.
MELVIN CALVIN, Ph.D., Professor of Chemistry.
WILLIAM F. GIAUQUE, Ph.D., Professor of Chemistry.
GEORGE E. GIBSON, Ph.D., Professor of Chemistry.
JOEL H. HILDEBRAND, Ph.D., Sc.D., Professor of Chemistry (Chairman of the Department).
*WENDELL M. LATIMER, Ph.D., Professor of Chemistry.
*AXEL R. OLSON, Ph.D., Professor of Chemistry.
**KENNETH S. PITZER, Ph.D., Professor of Chemistry.
GERHARD K. ROLLEFSON, Ph.D., Professor of Chemistry.
GLENN T. SEABORG, Ph.D., Professor of Chemistry.
THOMAS D. STEWART, Ph.D., Professor of Chemistry.
WALTER C. BLASDALE, Ph.D., Professor of Chemistry, Emeritus.
CHARLES W. PORTER, Ph.D., Professor of Chemistry, Emeritus.
MERLE RANDALL, Ph.D., Professor of Chemistry, Emeritus.
JAMES CASON, Ph.D., Associate Professor of Chemistry.
ROBERT E. CONNICK, Ph.D., Associate Professor of Chemistry.
BURRIS B. CUNNINGHAM, Ph.D., Associate Professor of Chemistry.
WILLIAM D. GWINN, Ph.D., Associate Professor of Chemistry.
GEORGE JURA, Ph.D., Associate Professor of Chemistry.
EDWIN F. ORLEMANN, Ph.D., Associate Professor of Chemistry.

* Not to be given, 1949-1950

** Absent on leave, 1949-1950.

² In residence spring semester only, 1949-1950.

RICHARD E. POWELL, Ph.D., Associate Professor of Chemistry.
 THEODORE VERMEULEN, Ph.D., Associate Professor of Chemical Engineering.
 LEO BREWER, Ph.D., Assistant Professor of Chemistry.
 LEROY A. BROMLEY, Ph.D., Assistant Professor of Chemical Engineering.
 MARSHALL W. CRONYN, Ph.D., Assistant Professor of Chemistry.
 WILLIAM G. DAUBEN, Ph.D., Assistant Professor of Chemistry.
 DONALD N. HANSON, Ph.D., Assistant Professor of Chemical Engineering.
 HENRY RAPOPORT, Ph.D., Assistant Professor of Chemistry.
 DAVID H. TEMPLETON, Ph.D., Assistant Professor of Chemistry.
 CHARLES R. WILKE, Ph.D., Assistant Professor of Chemical Engineering.
 BRUNO H. ZIMM, Ph.D., Assistant Professor of Chemistry.
 JOSEPH C. GUFFY, Ph.D., Instructor in Chemistry.
 DONALD S. MCCLURE, Ph.D., Instructor in Chemistry.
 DONALD S. NOYCE, Ph.D., Instructor in Chemistry.
 CHESTER T. O'KONSKI, Ph.D., Instructor in Chemistry.
 GEORGE C. PIMENTEL, Ph.D., Instructor in Chemistry.
 KENNETH STREET, Ph.D., Instructor in Chemistry.
 F. CAMPBELL WILLIAMS, Ph.D., Instructor in Chemical Engineering.
 HERMAN J. BRADLEY, Associate in Chemistry.
 CHARLES W. KOOH, M.S., Associate in Chemistry.



ISADORE PERLMAN, Ph.D., Professor of Chemistry, Radiation Laboratory.
 CHARLES W. TOBIAS, Ph.D., Lecturer in Chemical Engineering.

Letters and Science List.—All undergraduate courses except 143, 144, 145A–145B, 146A–146B, 147, and 149 are included in the Letters and Science List. For regulations governing this list, see page 85.

Entrance with Advanced Standing.—All undergraduate students entering the University with advanced standing, and students returning to the University after an absence of two years or more, who desire to take courses in chemistry more advanced than course 1B, must present themselves on or before the date of their registration to Professor Rollefson, 121 Lewis Hall, who will determine from their credentials or by an informal examination which courses they may undertake.

Choice of College.—A student may pursue the study of chemistry by enrolling either in the College of Chemistry (see page 99) or in the College of Letters and Science with a major in chemistry. In order to decide between the two alternatives, the student may note that the College of Letters and Science has certain general lower division requirements (see page 64) outside the preparation for the major, while the curriculum of the College of Chemistry is restricted mainly to chemistry, physics, and mathematics during the first two years. An upper division program in chemical engineering is offered in the College of Chemistry.

Letters and Science Upper Division Major Adviser: Mr. Giauque.

Preparation for the Major in the College of Letters and Science.—The recommended preparation is as follows: course 1A–1B, and one or more of courses 5, 12A, and 12B; Physics 4A, 4B, 4C; Mathematics 3A, 3B, 4A, 4B; and a reading knowledge of German.

The above-mentioned courses, though recommended, are actually required only in so far as they constitute prerequisites for courses included in the major. Prospective major students should familiarize themselves with such prerequisites, and the possible course sequence governed by them. Thus, Mathematics 4A is prerequisite to Chemistry 110A which in turn is prerequisite to many upper division courses.

High school students should note that the preparation for the major is

simplified if their high school program includes chemistry, physics, four years of mathematics, and two years of German.

The Major.—The major consists of from 24 to 30 units of upper division work in chemistry and allied subjects, taken in accordance with a plan approved by the departmental adviser. Normally at least 18 units of the major must be taken in the department, and must include two of the four courses, *Chemistry 12B, 105, 111, 120*. If one year of quantitative analysis has been completed elsewhere, *Chemistry 104* may be substituted for *Chemistry 105*.

All units in chemistry in excess of 13 are counted as upper division units toward the major; all units in chemistry in excess of 13, taken in the upper division, will count as upper division credit toward the 36-unit requirement. Ordinarily an average of at least 1.5 grade points per unit undertaken is required for admission to, or retention in, the major.

Honor Students in the Upper Division.—Upper division students in the College of Letters and Science who propose to make chemistry their major, are placed on the honors list when they have attained a scholarship average of at least grade B. Honor students are given a larger share of personal instruction and a greater opportunity to choose courses, and work within courses, in the manner best suited to individual needs and aims. Students not in the honors group are not, except in unusual circumstances and with the express permission of the instructor, permitted to enroll for honors courses (marked H) nor for undergraduate research. Students will not ordinarily be recommended for honors in chemistry at graduation unless their work includes courses 114H and 180H or other advanced courses approved by the Committee on Honors.

LOWER DIVISION COURSES

1A. General Chemistry. (5) I and II.

Mr. Hildebrand, Mr. Giauque, Mr. Gibson, Mr. Latimer,
Mr. Brewer, Mr. Connick, Mr. Jura, Mr. Powell, Mr.
Zimm, Mr. Gwinn, Mr. Rollefson, Mr. McClure, Mr.
O'Konski, Mr. Pimentel, Mr. Street, Mr. Templeton

I and II: Lectures (Mr. Hildebrand, Mr. Powell).

Prerequisite: high school chemistry or high grades in high school physics and mathematics. Admission will be determined by the student's high school grade and by the results of an aptitude test, to be given during the week of enrollment.

1B. General Chemistry. Qualitative Analysis. (5) II.

Mr. Gibson, Mr. Hildebrand, Mr. Giauque, Mr. Latimer, Mr. Pitzer,
Mr. Jura, Mr. Brewer, Mr. Gwinn, Mr. McClure, Mr. O'Konski,
Mr. Pimentel, Mr. Street, Mr. Powell, Mr. Templeton, Mr. Zimm
Lectures (Hildebrand).

Prerequisite: course 1A.

5. Quantitative Analysis. (3) I and II.

Mr. Olson, Mr. Koch, Mr. Orlemann, Mr. Guffy

Lecture and laboratory.

I: Lectures (Mr. Orlemann); II: Lectures (Mr. Olson).

Prerequisite: course 1B with a grade of C or higher.

8. A Short Survey of Organic Chemistry. (3) I and II.

Mr. Stewart

Prerequisite: course 1A.

Primarily for students not majoring in chemistry.

9. Organic Chemistry—Laboratory. (3) I and II.

Mr. Branch, Mr. Noyce

Lecture and laboratory.

Prerequisite: course 1B with a grade of C or higher. Course 8 may be taken concurrently.

12A. Organic Chemistry. (5) I and II.

Mr. Calvin, Mr. Cronyn, Mr. Noyce, Mr. Rapoport

Lectures and laboratory work designed for students whose major is chemistry.

Prerequisite: course 1B with a grade of C or higher.

Students with previous credit in course 8 are limited to 2 units credit for course 12A.

12B. Organic Chemistry. (5) I and II.

Mr. Calvin, Mr. Cason, Mr. Cronyn, Mr. Rapoport

Lectures and laboratory.

Prerequisite: courses 12A, or 8 and 9.

UPPER DIVISION COURSES

GROUP I

102. Advanced Organic Chemistry. (3) I.

Mr. Stewart

Prerequisite: courses 8, 9 or 12A; 109 or 110B; and a reading knowledge of German.

Kinetics and mechanisms of organic reactions; the determination of structure.

103. Advanced Organic Chemistry. (3) II.

Mr. Branch

Prerequisite: courses 8, 9 or 12A; 109 or 110A; and a reading knowledge of German.

Applications of electron structures and resonance to the chemical and physical properties of organic compounds.

104. Inorganic Chemistry. (3) II.

Mr. Latimer

Prerequisite: course 5.

The interpretation and correlation of inorganic reactions.

105. Advanced Quantitative Analysis. (3) I and II. Mr. Guffy, Mr. Orlemann

Lectures and laboratory.

Prerequisite: course 5.

109. Physical Chemistry—Brief Course. (3) I.

Mr. O'Konski

Prerequisite: course 5; one year of college physics.

Selected topics in physical chemistry.

Primarily for nonchemistry majors.

110A–110B. Physical Chemistry. (3–3) Yr.

Mr. Rollefson, Mr. Zimm

110A. I: Mr. Rollefson; II: Mr. Zimm.

110B. I: Mr. Zimm; II: Mr. Rollefson.

Prerequisite: course 5, Mathematics 4A, and Physics 4B.

The general principles of physical chemistry and elementary thermodynamics.

GROUP II

The courses in this group are designed primarily for honor students, but, with the approval of the instructor, other students of high academic standing may be admitted to any of these courses except those marked with the letter H.

100. Organic Chemistry—Analytical Methods. (3) I and II.

Prerequisite: courses 5 and 12B.

Mr. Cronyn, Mr. Dauben

101. Organic Chemistry—Synthetic Methods. (3) I and II.

Mr. Cason, Mr. Dauben

Prerequisite: course 12B. A reading knowledge of German is recommended.

111, 111H. Physical Chemistry—Laboratory. (3) I and II.

Mr. Gibson, Mr. Jura, Mr. Gwinn, Mr. Templeton

Prerequisite: course 110A (with a grade of C or higher), 110B (may be taken concurrently), or 109 with consent of the instructor; and calculus.

- 114H. Physical Chemistry—Thermodynamics. (3) I and II.
Mr. Giauque, Mr. Brewer, Mr. Gibson
Prerequisite: courses 5, 110A–110B; Physics 4C or equivalent; familiarity with differential and integral calculus.
115. Microchemistry. (3) I and II. Mr. Cunningham, Mr. Koch
Prerequisite: senior standing in chemistry.
Synthesis and preparation of organic and inorganic samples on the milligram and microgram scale and their analysis by gravimetric and volumetric methods.
118. Chemistry of Surfaces and Colloids. (2) I. Mr. Jura
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature in this field intelligently.
119. Photochemistry. (2) II. Mr. Rollefson
This course is offered in the form of independent study, with reports at regular intervals, and a final examination.
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature of this field intelligently.
120. Advanced Inorganic Chemistry. (3) I and II.
Lecture and laboratory. Mr. Connick, Mr. Powell, Mr. Templeton
Prerequisite: courses 5, 104 or 105, and 109 or 110B.
122. Phase Rule. (2) I. Mr. Brewer
Prerequisite: course 109 or 110B.
123. Nuclear Chemistry. (2) I. Mr. Seaborg, Mr. Perlman
Prerequisite: senior standing.
125. Instrumental Methods. (3) I and II.
Mr. Orlemann, Mr. Guffy, Mr. Bradley
Prerequisite: courses 105 or 120, and 111.
Theory and application of instrumental methods in such fields as spectroscopy, polarography, and radioactivity to chemical problems.
- 180H. Research. (2–15) I and II. The Staff (Mr. Hildebrand in charge)
Prerequisite: course 110B.
Students who have completed with high credit a satisfactory number of advanced courses may prosecute original research under the direction of one of the members of the instructing staff. The consent of the instructor must be obtained.
185. Chemical Preparations. (2–5) I and II.
The Staff (Mr. Hildebrand in charge)
Laboratory work for advanced undergraduates.
199. Special Study for Advanced Undergraduates. (2–3) I and II.
The Staff (Mr. Hildebrand in charge)
Any properly qualified student who wishes to pursue a problem of his own choice, through reading or nonlaboratory study, may do so if his proposed project is acceptable to the member of the staff with whom he works.

GROUP III

Chemical Engineering Courses. For program of upper division work in this field, see College of Chemistry, page 101.

143. Introduction to Chemical Engineering. (3) I.
Mr. Bromley, Mr. Williams
Prerequisite: course 109 or 110A (may be taken concurrently).
A survey of chemical industry in relation to major products, equipment

and economics. Problem work on weight and heat balances in representative processes.

144. Chemical Engineering Thermodynamics. (3) I and II.

Mr. Vermeulen, Mr. Tobias, Mr. Williams

Prerequisite: course 110B, Mechanical Engineering 105A, or consent of the instructor.

Thermal and volumetric properties of liquids and gases; interrelations of thermodynamic functions; power and refrigeration cycles; solutions; critical phenomena; reaction energetics and equilibria.

After 1949-1950, to be given in the spring semester only.

145A-145B. Unit Operations Laboratory. (2-2) Yr. Beginning each semester.

Mr. Hanson, Mr. Williams, Mr. Bromley, Mr. Wilke

Prerequisite: courses 143, 146A-146B (may be taken concurrently).

145A is prerequisite to 145B.

Material and energy measurements illustrating fundamental principles.

145A: pumping of fluids; turbulent and streamline flow; pressure drop in pipes and tower packings; heat transfer; evaporation.

145B: filtration, drying of solids, continuous distillation, extraction, absorption, crushing.

146A. Chemical Engineering Unit Operations. (3) II.

Mr. Vermeulen

Prerequisite: course 110B (may be taken concurrently), 143 (with a grade of C or higher), or consent of instructor.

Thermodynamic and frictional effects for liquid and gas flow in process equipment. Heat transmission in solids and in flow systems; radiation and pyrometry; evaporation.

146B. Chemical Engineering Unit Operations. (3) I.

Mr. Hanson

Prerequisite: courses 110B, 143, and 146A or equivalent.

Diffusional operations: absorption, extraction, humidification, drying. Fractional distillation. Filtration, crushing and grinding, mechanical separation.

147. Organic Chemical Unit Processes. (3) II.

Mr. Stewart, Mr. Wilke

Prerequisite: courses 12B and 143, or consent of the instructor.

Reaction variables and kinetics, and product recovery problems in catalytic processes such as chlorination, nitration, sulfonation, fermentation, esterification, hydrolysis, alkylation, hydrogenation, cracking, and polymerization.

149. Design of Chemical Process Plants. (3) II.

Mr. Bromley

(Formerly numbered 149H.)

Prerequisite: courses 144 (may be taken concurrently), 146A-146B.

Class discussion of sources of data and of design principles, with individual and team study of selected plant design and process evaluation problems.

GRADUATE COURSES

Concerning conditions for admission to work for higher degrees, see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

207A. Organic Chemistry. (2) I.

Mr. Cason

Open to properly qualified graduate students.

Advanced synthetic topics such as the applications of Grignard reaction and enolate condensations. The chemistry of polycyclic aromatic compounds.

207B. Organic Chemistry. (2) II.

Mr. Rapoport

Open to properly qualified graduate students. 207A is not prerequisite to 207B.

The chemistry of heterocyclic compounds, including the alkaloids.

- *207C. Organic Chemistry. (2) Mr. Dauben
Open to properly qualified graduate students. 207A and 207B are not prerequisite to 207C.
The chemistry of polycyclic compounds of biological interest, with emphasis on sterols and related compounds. The chemistry of the carbohydrates.
216. Physical Chemistry, Advanced. (3) II. Mr. Giauque
Prerequisite: courses 111H and 114H. Open to senior honor students with the consent of the instructor.
Selected topics. Use of variables other than pressure, temperature, and composition. Third Law of Thermodynamics. Evaluation of thermodynamic quantities from spectroscopic and other molecular data. Interionic attraction theory of electrolytic solutions.
217. Quantum Theory. (3) II. Mr. Gwinn
Recommended preparation: differential equations or advanced calculus, atomic physics and thermodynamics. Open to senior honor students with the consent of the instructor.
223. Advanced Nuclear Chemistry. (2) II. Mr. Seaborg, Mr. Perlman
Prerequisite: course 123.
Certain advanced topics relating to the chemistry of the products formed in various types of nuclear disintegrations.
280. Research. (1-9) I and II. The Staff (Mr. Hildebrand in charge)
Students limited to a program of 4 units may be allowed to enroll for 1 unit.
The laboratory is open at all times to a limited number of qualified graduate students who wish to pursue original investigations. Students who wish to enroll for this work should communicate with the chairman of the department well in advance of the opening of the semester in which the work is to be done. Such work will ordinarily be under the direction of some member of the instructing staff, who will determine the credit value. A list of publications indicating the types of problems now under investigation in the laboratory will be sent on request.
290. Seminar. (1-4) I and II. The Staff (Mr. Hildebrand in charge)
As a rule several seminars are offered each semester. The subjects will vary from year to year and will be announced at the beginning of each semester. The following subjects have been studied in recent seminars: atomic structure and magnetic phenomena; nuclear chemistry and the use of tracers; mechanisms of reactions; stereochemistry; the chemical bond; molecular arrangements; color of organic molecules; resonance and molecular structure; statistical mechanics; the liquid state; photochemistry. A seminar on topics of interest in chemical engineering will also be offered.
299. Special Study for Graduate Students. (2-4) I and II. The Staff (Mr. Hildebrand in charge)
Any properly qualified graduate student who wishes to pursue a problem of his own choice, through reading or nonlaboratory study, may do so if his proposed project is acceptable to the member of the staff with whom he works.
- Research Conference. (No credit)
Members of the instructing staff and students engaged in graduate research meet once a week to discuss the various investigations in progress in the laboratory.

* Not to be given, 1949-1950

Chemical Engineering

Chemistry 146B or its equivalent is prerequisite to all courses in this group.

244. Distillation. (3) II. Mr. Hanson
Design calculation methods for fractionation columns in binary and multicomponent separations.
245. Diffusional Operations. (3) I. Mr. Wilke
Fundamentals of diffusion in static and flow systems. Advanced treatment of absorption, adsorption, drying and related unit operations, in relation to mass-transfer theory.
246. Phase Equilibria in Extraction Operations. (2) I. Mr. Vermeulen
Theory of ternary liquid systems; design of liquid-liquid contact equipment; azeotropic and extractive distillation.
249. Special Study for Graduate Students in Chemical Engineering. (2-4) I and II. The Staff (Mr. Wilke in charge)
Properly qualified graduate students who wish to pursue independent study may work on the development of new calculation methods for a single unit operation or the application of existing design data to a single process.
250. Research in Chemical Engineering. (1-6) I and II. The Staff (Mr. Vermeulen in charge)
Research facilities will be provided for graduate study in the unit physical operations and the unit chemical processes.

CHILD DEVELOPMENT

Instruction in child development is not organized as a single administrative unit in the University but is offered in its several aspects by a number of departments. Research in the field is carried on, in varying degree, by all of these departments and also by the Medical School, the Institute of Child Welfare, and the College of Dentistry.

An undergraduate major in child development in the Department of Home Economics and the following courses offer material of special interest to students in the field of child development. Further information in regard to instruction, including the opportunities which exist for the planning of programs of study, may be obtained from the chairman or major adviser of any of the departments indicated in this list.

Growth and Development of Children. (Education 111, Mrs. Bailey)

The Exceptional Child. (Education 116)

Counseling, Child Welfare, and Parent Education. (Education 284, Mrs. Bailey)

Social Development of Children and Youth. (Education 285, Mrs. Bailey)

Child Psychology. (Home Economics 132, Miss Landreth)

Laboratory in Child Development. (Home Economics 133, Miss Landreth)

*Child Care. (Home Economics 134, Miss Landreth)

Techniques with Young Children. (Home Economics 135, Miss Landreth)

Nursery School Administration. (Home Economics 435, Miss Landreth)

Principles of Pediatrics. (Nursing 444A, Mr. Bruyn. Given in the School of Nursing, Medical Center, San Francisco.)

Pediatric and Communicable Disease Nursing. (Nursing 444E, Miss Smith. Given in the School of Nursing, Medical Center, San Francisco.)

* Not to be given, 1949-1950.

Physiology of Growth and Development in the Child.

(Physiology 102, Mr. Copp)

Adolescence.

(Psychology 113, Mr. Jones)

Tests and Measurements of Infants and Preschool Children.

(Psychology 116, Miss Bayley)

Laboratory Tests and Measurements of Infants and Preschool Children.

(Psychology 117, Miss Bayley)

Mental Deficiency.

(Psychology 160, Miss Bridgman)

Clinical Psychology.

(Psychology 162, Mrs. Macfarlane)

Clinical Methods.

(Psychology 261A-261B, Mr. Immergluck, Mr. Tuddenham)

Developmental Psychology.

(Psychology 112, Mr. Jones)

Laboratory in Adolescent Development.

(Psychology 115, Mr. Jones)

Child Hygiene.

(Public Health 125, Miss Bierman, Mrs. Bryan)

Child Welfare.

(Social Welfare 253A-253B, Mrs. Fredericksen)

Emotional Development of Children.

(Social Welfare 266A-266B, Mrs. Maenchen, Mr. Erikson)

CITY AND REGIONAL PLANNING

T. J. KENT, JR., A.B., M.C.P., Associate Professor of City Planning (Chairman of the Department).



FRANCIS VIOLICH, B.S., Lecturer in City Planning.

The Department of City and Regional Planning, established in July, 1948, offers a graduate program of professional training in the field of urban planning.

The program includes courses in the theory and practice of urban planning offered by this department, and courses in related fields of study offered by members of other departments. Some of these courses may be open to qualified undergraduate students. It is expected that courses in addition to those listed below will be offered by the Department of City and Regional Planning during the 1949-1950 academic year. See SUPPLEMENTARY ANNOUNCEMENTS to the GENERAL CATALOGUE for further information.

GRADUATE COURSES

201. Seminar in City Planning History and Theory. (2) I. Mr. Violich
(Formerly numbered 201A.)
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Historical background of the modern city planning movement, and the theory and practice of contemporary city planning.
202. Seminar in City Planning Principles and Methods. (2) II. Mr. Violich
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Description and analysis of the methods and techniques used in the practice of contemporary city planning.
203. Seminar in City Planning Law and Administration. (2) I. Mr. Kent
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Survey of city planning and urban redevelopment legislation; legal basis for planning law, including review of legal aspects of administration of zoning and subdivision regulations; organizational and administrative problems of planning agencies and boards of adjustment.

204. Seminar in Advanced City Planning Theory and Comparative Programs. (2) II. Mr. Kent
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Detailed examination and analysis of outstanding contemporary city planning programs; case study of the planning organization and program for London; analysis of the status of city planning programs for the metropolitan San Francisco Bay Area.
211. City Planning Problems, First Course. (4) I. Mr. Kent
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including elementary problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
212. City Planning Problems, Second Course. (4) II. Mr. Kent
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Practical application of urban planning theory to towns, cities, metropolitan regions, and urban counties, including problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
213. City Planning Problems, Third Course. (4) I. Mr. Kent
Prerequisite: graduate standing and a minimum of 12 units in subjects basic to the field.
Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including advanced problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.

CLASSICS

- LUDWIG EDELSTEIN, Ph.D., Professor of Greek.
- * MURRAY B. EMENEAU, Ph.D., Professor of Sanskrit and General Linguistics.
- LOUIS ALEXANDER MACKEY, M.A. (Oxon.), Professor of Latin (Chairman of the Department).
- H. R. W. SMITH, Ph.D., Professor of Latin and Classical Archaeology and Associate Curator of Classical Archaeology.
- WILLIAM H. ALEXANDER, Ph.D., LL.D., F.R.S.C., Professor of Latin, Emeritus.
- MONROE E. DEUTSCH, Ph.D., LL.D., Professor of Latin, Emeritus.
- IVAN M. LINFORTH, Ph.D., Professor of Greek, Emeritus.
- LEON J. RICHARDSON, A.B., LL.D., Professor of Latin, Emeritus.
- JOSEPH FONTENROSE, Ph.D., Associate Professor of Classics.
- ARTHUR E. GORDON, Ph.D., Associate Professor of Latin.
- * WILLIAM M. GREEN, Ph.D., Associate Professor of Latin.
- WILLIAM KENDRICK PRITCHETT, Ph.D., Associate Professor of Greek.

* Absent on leave, 1949-1950.

² In residence spring semester only, 1949-1950.

BEN L. CHARNEY, Ph.D., Assistant Professor of Latin.

WILLIAM C. HELMBOLD, Ph.D., Assistant Professor of Classics.



ERIC ROBERTSON DODDS, M.A., Litt.D., F.B.A., Sather Professor of Classical Literature for the fall semester.

JOHANNA GOETZL, Ph.D., Lecturer in Classics.

Letters and Science List.—All undergraduate courses in Classics, Greek, Latin, and Sanskrit are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Gordon.

Preparation for the Major in Classics.—Required: Greek 1 or 1A-1B; Latin 1, 2, 3 (or the corresponding courses in the high school), 4.

The Major in Classics.—Required: Greek 100, 101, 102, 103; Latin 105, 106, 107, 108.

GREEK

Major Adviser: Mr. Gordon.

Preparation for the Major.—Required: Greek 1 or 1A-1B. Recommended: Latin 1, 2, 3, 4.

The Major.—The following courses must be included in the major of 24 units: (a) Greek 100, 101, 102, 103, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Greek. The remaining units of the 24 must be chosen, with the advice of the department, from the following: upper division courses in Classics, Greek, Latin, Sanskrit, and in the History of Ancient Art; History 111A.

LATIN

Major Adviser: Mr. Gordon.

Preparation for the Major.—Required: Latin 1, 2, 3 (or the corresponding courses in the high school), 4. Recommended: Greek 1 or 1A-1B.

The Major.—The following courses must be included in the major of 24 units: (a) Latin 105, 106, 107, 108, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Latin. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Latin, Greek, Sanskrit; Art 153 (Aegean); Art 154A-154B (Greek); Art 159 (Roman); History 111B; but the department will consider as well other courses which the student may suggest.

CLASSICS

COURSES WHICH DO NOT REQUIRE A KNOWLEDGE OF THE GREEK OR THE LATIN LANGUAGE

(Courses in this group are designated Classics 34, Classics 35, etc.)

- *34. Epic Poetry: Homer and Vergil. (2) I. Mr. Fontenrose
A study of the *Iliad*, *Odyssey*, and *Aeneid* with reference to content, structure, significance, and influence.
35. Greek Drama. (2) II. _____
Lectures on twelve Greek tragedies.
- *36. Plato. (2) II. Mr. Edelstein
Lectures and readings. Selected dialogues.
- 37A-37B. Survey of Greek Literature. (2-2) Yr. Mr. Helmbold
An effort to present the main movements and personalities in classical Greek literature, Homer to Lucian.
138. The Greek and Roman Historians. (2) II. Mr. Pritchett
(Formerly numbered 38.)
Lectures on the major classical historians.

* Not to be given, 1949-1950.

139. Aristotle. (2) I. Mr. Edelstein
151. Greek Religion. (2) I. Mr. Fontenrose
The worship of the gods in ancient Greece; cults and religious ideas.
- 170A. Classical Archaeology. (2) I. Mr. Smith
Vase painting in Greece and Italy to 600 B.C.
- 171A. Classical Archaeology. (2) II. Mr. Smith
Archaeological method.
178. Greek and Roman Mythology. (2) II. Mr. Fontenrose
Myths, legends, and folk tales of ancient Greece and Italy; their place in the literature and art of both the ancient and the modern world.
- 180A-180B. The Latin Classics in English. (2-2) Yr. Mr. MacKay
I: The Republic.
II: The Early Empire.
Open to lower division students by consent of the instructor.
- 182A-182B. Ancient Classical Civilization. (2-2) Yr. Mr. Gordon
- *193. Introduction to General Linguistics. (2) II. Mr. Emeneau
The principles and techniques of descriptive and comparative grammar.
Prerequisite: some knowledge of one language other than English.
- *194. Phonetics and Phonemics. (2) I. Mr. Emeneau
(Formerly numbered 193.)
Lectures on the phonetic phenomena employed in language utterances, and on the technique of their analysis into phonemic entities and patterns. Practice in the hearing and transcribing of exotic languages with the aid, when possible, of native speakers. Open to students who, in the opinion of the instructor, are properly qualified.
195. Linguistic Analysis. (2) II. Mr. Emeneau
Prerequisite: a course in phonetics (e.g. Oriental Languages 167 or an equivalent course).
Lectures and practice in analysis of morphology and syntax.
- *196. Introduction to Indo-European Comparative Grammar. (3)
Prerequisite: a fair knowledge of at least one of the older Indo-European languages (e.g. Latin) and of one of the modern Indo-European languages other than English or a Romance language.
- *197. India. (2)
The social, economic, and political structure of modern India.

GREEK

(Courses in this group are designated Greek 1, Greek 1A, Greek 1B, etc.)

Language and Literature

LOWER DIVISION COURSES

1. Greek for Beginners. Double Course. (5) II. Mr. Helmbold
1A-1B. Greek for Beginners. (3-3) Yr. Mr. Pritchett

UPPER DIVISION COURSES

Greek 100, 101, 102, 103 should be completed before the other courses are undertaken.

100. Xenophon, *Anabasis*, and Attic Prose Writing. (3) I. Mr. Pritchett
101. Homer. (3) II. _____
102. Plato: *Apology and Crito*. (3) I. Mr. Edelstein
103. Drama. (3) II. Mr. Edelstein

* Not to be given, 1949-1950.

104. Herodotus. (3) II. Mr. Edelstein
 111. Aeschylus. (3) I. Mr. Dodds
 *139A-139B. Comparative Grammar of Greek and Latin. (2-2) Yr.
 Mr. Helmbold
 Prerequisite: at least Greek 101 or Latin 4, or consent of the instructor.
 139A: Phonology; 139B: Morphology. Either semester may be taken
 separately.
 150. Greek Prose Composition. (2) I. _____
 Prerequisite: Greek 100.
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Edelstein in charge

LATIN

(Courses in this group are designated Latin 1, Latin 2, etc.)

Language and Literature

LOWER DIVISION COURSES

1. Latin for Beginners. (4) I and II.
 Mr. Fontenrose, Miss Goetzl, Mr. Helmbold
 1A-1B. Latin for Beginners. (3-3) Yr. Mr. Charney
 2. Elementary Latin Readings. (4) I and II.
 Mr. Charney, Miss Goetzl, Mr. Helmbold, Mr. Gordon, Mr. Fontenrose
 Prerequisite: two years of high school Latin or Latin 1.
 Reading and composition.
 3. Vergil. (4) I and II. Mr. Smith, Miss Goetzl
 Prerequisite: three years of high school Latin, or Latin 2 or 48A-48B.
 Readings in the *Aeneid* I-VI; grammar review and composition.
 4. Cicero and Ovid. (4) I and II. Mr. Fontenrose, Miss Goetzl
 Prerequisite: four years of high school Latin, or Latin 3 or 48A-48B.
 Reading of a selected oration or essay of Cicero and selected poems of Ovid;
 grammar review and composition.
 9A-9B. Latin Composition. (2-2) Yr. Mr. Charney
 48A-48B. Intensive Review of Elementary Latin through Caesar. (2-2) Yr.
 Mr. Charney
 Review course for students requiring Latin for advanced degrees; open
 also, with the instructor's consent, to students who have had no Latin.
 Does not fulfill requirement (b) or (c) for the Associate in Arts degree
 in the College of Letters and Science.
 49. Practice in Latin Reading. No credit. I and II. Miss Goetzl
 Prerequisite: Latin 1 and 2, or equivalent.
 An intensive course for graduate students of other departments who
 are preparing to meet the requirement of a reading knowledge of Latin.

UPPER DIVISION COURSES

Prerequisite: Latin 4. Latin 105, 106, 107, 108 should be completed before
 the other courses (except 109A-109B) are undertaken.

(For comparative grammar of Latin and Greek, see Greek 139A-139B.)

105. Livy. (3) I. Mr. MacKay
 106. Horace: *Odes and Epodes*. (3) II. Mr. Smith
 107. Cicero: *Tusculan Disputations*. (3) II. Mr. Gordon
 108. Roman Comedy. (3) I. Mr. Charney
 109A-109B. Composition and Sight Reading. (2-2) Yr. Mr. Smith

* Not to be given, 1949-1950.

143. Lucretius. (3) I. Mr. Fontenrose
 146. Sallust. (3) II. Mr. MacKay
 166. Latin Verse Composition. (1) II. Mr. Smith
 199. Special Study for Advanced Undergraduates. (1-5) I and II. Mr. MacKay in charge

SANSKRIT

(Courses in this group are designated Sanskrit 190A, Sanskrit 190B, etc.)

Language and Literature

- *190A-190B. Elementary Sanskrit. (3-3) Yr. Mr. Emeneau
 199. Special Study for Advanced Undergraduates. (1-5) Mr. Emeneau in charge

CLASSICS**GRADUATE COURSES**

All graduate courses in this department are designated Classics (Classics 200, etc.).

(Concerning conditions for admission to graduate courses, see page 163)

200. Special Study. (1-5) I and II. Mr. Fontenrose in charge
 206. The Greek Lyric Poets. (3) I. Mr. Pritchett
 220A-220B. Aristotle, *Ethics*. (3-3) Yr. Mr. Edelstein
 225. The Attic Orators. (3) II. Mr. Pritchett
 241A. Cicero's *Letters*. (3) I. Mr. Gordon
 249. Propertius. (3) II. Mr. Helmbold
 251B. Tragedies of Seneca. (3) I. Mr. MacKay
 255. Lucan. (3) II. Mr. MacKay
 271A-271B. Advanced Course in Archaeological Method. (2-2) Yr. Mr. Smith
 *273. Problems in Attic Topography. (2) II. Mr. Smith
 *290A-290B. Advanced Sanskrit. (1-5; 1-5) Yr. _____
 Pali and Prakrit will be studied also.

COMPARATIVE LITERATURE*Committee in Charge:*

- ¹ EDWARD V. BREWER, M.A., Professor of German.
 ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology.
 ARNOLD H. ROWBOTHAM, Ph.D., Professor of French (Chairman of the Committee).
 ALAN R. THOMPSON, Ph.D., Professor of Speech and Dramatic Literature.
 RONALD N. WALPOLE, Ph.D., Associate Professor of French.

Instruction in comparative literature is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments. The degree of Master of Arts will be conferred upon qualified graduate students who complete the requirements. Prospective candidates for the degree should consult the chairman of the committee in charge.

Preparation for the Major.—Required: an adequate knowledge of two foreign languages; 12 upper division units in each of two literatures, read in the

* Not to be given, 1949-1950.

¹ In residence fall semester only, 1949-1950.

original, or an equivalent competence, tested by examination. Recommended: further study in courses dealing with more than one literature, such as Dramatic Art 157A-157B, Modern European Drama; Dramatic Art 160A-160B, Dramatic Theory; English 44A-44B, Masterpieces of Literature; English 154, Master Spirits of Literature; Philosophy 136A-136B-136C, Aesthetics; Philosophy 146, Philosophy in Literature.

The Major.—Twenty units of upper division or graduate courses and a thesis, in accordance with Plan I of the requirements for the degree of Master of Arts. A subcommittee will be in charge of the candidate's program and will be responsible for approving and directing the work on the thesis.

GRADUATE COURSE

298. Special Study for Graduate Students. (1-4) I and II.

Committee in charge

DECORATIVE ART

HOPE M. GLADDING, Professor of Decorative Art and Design.

MARY F. PATTERSON, Associate Professor of Decorative Art and Design, Emeritus.

ANNA HADWICK GAYTON (Anna Hadwick Gayton Spier), Ph.D., Associate Professor of Decorative Art.

LEA VAN PUymbROECK MILLER, M.A., Associate Professor of Decorative Art and Design.

LUCRETIA NELSON, M.A., Associate Professor of Design.

WINFIELD SCOTT WELLINGTON, M.A., Gr.Arch., Associate Professor of Design (Chairman of the Department of Decorative Art), Associate Curator of Art, and Director of the Art Gallery.

MARY A. DUMAS, M.A., Assistant Professor of Decorative Art.

WILLARD V. ROSENQUIST, M.A., Assistant Professor of Decorative Art.



ROBERT G. BENSON, A.B., Lecturer in Decorative Art.

JOHN E. FRENCH, M.A., Lecturer in Decorative Art.

Letters and Science List.—All undergraduate courses in decorative art are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. Wellington, Miss Gladding.

Entrance with Advanced Standing.—All undergraduate transfer students requesting advanced standing are required to present examples of their work for evaluation by the staff. All transfer students should register in course 16A.

Preparation for the Major.—Required: course 16A-16B (4), and Art 2A (2). Recommended: Architecture 1 (3); Art 2B (2), 3A (2), 3B (2); History 4A-4B (6). If desired, this work may be completed in the upper division. The recommended courses are actually required only in so far as they constitute prerequisites for upper division courses included in the major. Prospective major students should familiarize themselves with such course sequences.

In order to gain major status in the department, a student must have attained at least a 1.5 average in the lower division courses in decorative art preparatory to the major. Students who fail to maintain a satisfactory scholarship average may be dismissed from the major at any time.

The Major.—Required: 24 units of upper division work in decorative art and allied subjects, including 160A (2), 175A (2) or 175B (2), 176A (2), 180A-180B (6) or 193A-193B (6) or 195A-195B (6); Philosophy 136A (3) and other courses aggregating at least 6 units chosen from the remaining upper division courses in the department.

Three units chosen from the following allied courses in other departments may be taken as major work in decorative art: Anthropology 126 (3); Architecture 110 (1); Art 173 (2); Philosophy 136B (3); Sociology 141A (3), 141B (3), 142A (3), or 142B (3).

Courses 175A-175B, 176A, 193A-193B, 195A-195B should normally be taken in the junior year. Courses 130A-130B, 196A-196B should be taken in the senior year.

Honors.—Senior students who have attained at least a B average in their major courses may enroll for course 199.

Honors at graduation are awarded to students who have completed their major work with distinction and have attained uniformly high grades in all their college work.

Exhibits.—Students' work may be retained by the department as exhibit material for a specified time.

LOWER DIVISION COURSES

16A-16B. Theory of Design and Color. (2-2) Yr. Beginning each semester.

Miss Nelson, Miss Dumas, Mr. Rosenquist, Mr. Benson, Mr. French
16A surveys the basic elements of the subject and their relation to everyday life through experience in designing with line, space, and color. 16B recapitulates and extends this experience.

26A-26B. Theory of Design and Color: Second-Year Problems. (2-2) Yr.

(Formerly numbered 60A-60B.) Mrs. Miller

UPPER DIVISION COURSES

127. Primitive Art. (2) I.

Miss Nelson
Investigation of the structure of prehistoric, primitive, and barbaric art.

130A-130B. Interior Design. (2-2) Yr.

Mr. Wellington

130A is prerequisite to 130B.

Lectures: the design, selection, and arrangement of furniture with special consideration for its relation to the architectural background.

160A-160B. Advanced Design. (2-2) Yr. Beginning each semester.

Miss Gladding, Miss Dumas

Prerequisite: course 16A-16B, and Art 2A. With the approval of the instructor, 160A and 160B may be taken out of their normal sequence in either semester. Enrollment limited by laboratory facilities.

A study of pattern beyond the single unit of design, executed in various media.

166. Principles of Three-dimensional Abstract Design. (3) II.

Miss Nelson, Mr. Rosenquist

Enrollment limited by laboratory facilities.

Prerequisite: some advanced design experience and approval of the instructor.

Basic elements of three-dimensional space from low relief to full round and mobile forms. Laboratory problems executed in simple techniques.

167. Sources of Industrial Design. (2) II.

Miss Nelson

Thought and effort important to the development of machine art from its inception during the Industrial Revolution.

175A-175B. Primitive and Folk Textiles. (2-2) Yr.

Miss Gayton

Textile arts in their historical and cultural settings.

175A. Native America; Oceania; Indonesia.

175B. Egypt; Persia; Peasant, Medieval, and Renaissance Europe.

Either half of this course may be taken independently.

- 176A-*176B. Textile Design. (2-2) Yr. Mrs. Miller
Enrollment limited by laboratory facilities; preference given to students majoring in decorative art.
Prerequisite: courses 16A-16B and 175A or 175B. Course 175A or 175B may be taken concurrently. Recommended: course 26A-26B.
Analyses, reconstructions, and experiments on the loom, emphasizing design, color, and texture.
- *179. Textile Analysis. (2) II. Miss Gayton
Prerequisite: courses 175A, 176A-176B.
Enrollment limited by laboratory facilities; preference will be given to students majoring in decorative art. The consent of the instructor must be obtained.
- 180A-180B. Survey of Expressions in Materials. (3-3) Yr. Mr. Wellington
A study of form as exemplified by significant objects made from metals, wood, glass, clay, etc. Either half of this course may be taken independently.
- 193A-193B. Historic Costume. (3-3) Yr. Miss Gayton
Costumes of various times and places with reference to design, material, cultural factors, and contemporary arts.
193A. Native America; Indonesia; Asia.
193B. Classic Mediterranean; Medieval to Modern Europe; selected folk costume.
Either half of this course may be taken independently.
- 195A. The Great Periods in Interior Design. (3) I. Miss Gladding
The study of the periods as applied to domestic interiors.
- 195B. American Decorative Art from the First Colonial Periods to 1850. (3) II. Miss Gladding
Spanish, English, Dutch Colonial Periods, and the Federal Period. Lectures, with slides, from material in museum collections and private houses showing the work of the more significant artists, housewrights, and craftsmen.
- 196A-196B. Interior Design. (2-2) Yr. Beginning each semester. Mr. Wellington
Prerequisite: courses 16A-16B, 130A-130B, 195A, Architecture 1. 196A is prerequisite to 196B.
130A and 130B may be taken concurrently with 196A and 196B respectively. Upper division students in architecture are not required to fulfill design course prerequisites and 195A.
Periods of individual criticism and discussion of theory involved. Drawn problems.
199. Special Study for Advanced Undergraduates. (1-2) I and II. The Staff (Miss Nelson in charge)
Prerequisite: senior standing in decorative art and a B average or higher in major courses. Candidates for the master's degree will be expected to consult with the graduate adviser concerning specific requirements.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Seminar in Decorative Art. (2) I and II.

The Staff (Miss Gladding in charge)

294A. American Decorative Art. (2) II.

Miss Gladding

* Not to be given, 1949-1950.

294B. Textiles. (2) II.

Miss Gayton

Studies based upon materials selected from the various collections in the
Museum of Anthropology.

*294C. Decorative Motifs in Oriental Art. (2) I.

Mr. Wellington

294D. Components of Costume. (2) I.

Miss Gayton

299. Directed Research. (2-4) I and II.

The Staff (Mr. Wellington in charge)

DRAMATIC ART

FRED O. HARRIS, M.F.A., Associate Professor of Dramatic Art (Chairman of
the Department).

ARTHUR KLEIN, Ph.D., Assistant Professor of Dramatic Art.

ROBERT H. CHAPMAN, A.B., Instructor in Dramatic Art.

MARQUIS DE BASSECOURT PATTERSON, M.F.A., Instructor in Dramatic Art.

MARY JANE ARRABIT, A.B., Associate in Dramatic Art.



ALWIN KRONACHER, Ph.D., Lecturer in Dramatic Art.

LESLIE J. MAHONEY, A.B., Lecturer in Dramatic Art.

ALAN R. THOMPSON, Ph.D., Professor of Speech and Dramatic Literature.

Letters and Science List.—All undergraduate courses are included in the
Letters and Science List, except the following: courses 190, 191, 192, and 193.
For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. HARRIS.

Preparation for the Major.—Required: course 10A-10B (3-3), Theory of
Acting.

The Major.—Required: 24 units of upper division courses including 15 units
in dramatic art, with not more than 6 units of Dramatic Art 190, 191, 192, 193,
and 9 units in dramatic literature, history of drama, and history of theater.
In addition, students will be required to complete 6 units of supervised labora-
tory work in the University Theater without credit. The department will certify
to the completion of a major program for graduation only on the basis of at
least a C average in the upper division courses taken in the department.

(A) Dramatic Art Courses: Theory. Courses 130A, 130B, 130C, 130D (3-3-
3-3), not more than 6 units of which will apply to the major. Courses 120 (3),
135 (3), 152 (3), 160A-160B (3-3).

(B) Dramatic Art Courses: Practice. Courses 190, 191, 192, 193, not more
than 6 units of which will apply to the major.

(C) Courses in Dramatic Literature, History of Drama, and History of
Theater: Courses 140 (3), 157A-157B (3-3), English 114A-114B, 117A-117B
(3-3-3-3), 117E (3), 154 (3), Classics 103 (3), 108 (3), Spanish 105 (3),
109A-109B (2-2), 111A-111B (2-2). French 115A-115B (2-2), 120A-120B
(2-2), German 104 (3), 106 (3), 109 (3), Italian 100 (3), Scandinavian 106
(3), Slavic 135 (2).

(D) Recommended Courses: Lower Division: Classics 34 (2), 35 (2), Eng-
lish 1A-1B (3-3), Music 27A-27B (3-3), Speech 2A-2B (3-3). Upper Di-
vision: Classics 178 (2), Philosophy 136A-136B (3-3), course 407 (3).

The University Theater

Under the direction of the Department of Dramatic Art, the University The-
ater presents a major and a studio series of play productions. These presenta-

* Not to be given, 1949-1950.

tions have a twofold purpose: (1) to present to the University community a program of distinguished dramas of all times and all countries; (2) to afford the students in the University an effective experience in dramatic art. Participation in the presentations is open to all students.

LOWER DIVISION COURSES

- 10A-10B. Theory of Acting. (3-3) Yr. Beginning each semester.
Mr. Harris, Mr. Mahoney, Miss Arrabit

UPPER DIVISION COURSES

Group A. Dramatic Art: Theory and Practice

120. Theory of Stage Design. (3) I and II. Mr. Klein
Prerequisite: upper division standing and course 10A-10B.
Approaches, methods, and materials central to the visual aspects of theater.
130. Advanced Theory of Acting.
Mr. Chapman, Mr. Kronacher, Mr. Patterson
Prerequisite: course 10A-10B, and consent of the instructor.
- 130A. Greek Drama. (3) II. Mr. Patterson
- 130B. Shakespearean Drama. (3) I. Mr. Chapman, Mr. Kronacher
- 130C. Seventeenth- and Eighteenth-Century Drama. (3) II.
Mr. Chapman
- 130D. Modern Drama. (3) I. Mr. Patterson
135. Theory of Directing. (3) I and II. Mr. Harris
Prerequisite: upper division standing and courses 10A, 10B.
152. Creative Playwriting. (3) I and II. Mr. Chapman, Mr. Kronacher
Prerequisite: upper division standing and consent of the instructor.
- 160A-160B. Dramatic Theory. (3-3) Yr. Mr. Thompson
Lectures and reports.
Primarily for seniors. Some acquaintance with dramatic literature, especially Greek drama, is necessary; previous work in aesthetics and literary criticism is desirable.
190. Laboratory Projects in Acting. (1-6) I and II.
The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 407, and consent of the department.
191. Laboratory Projects in Directing. (1-6) I and II.
The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 120, 135, 407, and consent of the department.
192. Laboratory Projects in Stagecrafts. (1-6) I and II.
The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 120, and consent of the department.
193. Laboratory Projects in Playwriting. (1-6) I and II.
The Staff (Mr. Chapman in charge)
Prerequisite: course 152 and consent of the department.
Not more than 6 units from courses 190, 191, 192, and 193 will be credited toward the major.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Harris in charge)
407. Speech for the Stage. (3) I and II. Mr. Patterson
Prerequisite: courses 10A, 10B, and consent of the instructor.

Group B. Dramatic Literature and History of Drama

140. Theater Backgrounds. (3) I and II. Mr. Klein
Prerequisite: upper division standing.
Philosophical, cultural, and social forces in their relation to the theater as an institution and as an art.
- 157A-157B. Modern European Drama. (3-3) Yr. Mr. Thompson
Course 157A is not prerequisite to 157B.
A survey, exclusive of England, from Goethe to the present. Half the first semester will be devoted to the study of Ibsen.

RELATED COURSES IN OTHER DEPARTMENTS

- English 114A-114B. The English Drama. (3-3) Yr.
English 117A-117B. Shakespeare. (3-3) Yr.
English 117E. Shakespeare. (3).
English 154. Great Dramatists, Ancient and Modern. (3) I.
French 115A-115B. Modern French Drama. (2-2) Yr.
French 120A-120B. The Seventeenth Century. (2-2) Yr.
Greek 103. Drama. (3) II.
German 104. Dramas of the Nineteenth Century. (3) II.
German 106. Schiller's Dramas. (3) II.
German 109. Goethe's Verse Dramas. (3) II.
Italian 100. Survey of Modern Drama from Goldoni to the Present. (3) II.
Latin 108. Roman Comedy. (3) I.
Scandinavian 106. History of Scandinavian Drama. (3) I.
Slavic 135. The Russian Drama. (2) II.
Spanish 105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I.
Spanish 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr.
Spanish 111A-111B. Cervantes. (2-2) Yr.
The attention of the student is directed to the Group Major in Dramatic Literature (see page 75).

ECONOMICS

- JOE S. BAIN, JR., Ph.D., Professor of Economics.
ROBERT A. BRADY, Ph.D., Professor of Economics.
JOHN B. CONDLIFFE, Sc.D., LL.D., Professor of Economics.
IRA B. CROSS, Ph.D., Professor of Economics on the Flood Foundation.
WILLIAM L. CRUM, M.A., Sc.D. (hon.c.), Ph.D., Professor of Economics.
STUART DAGGETT, Ph.D., Professor of Transportation on the Flood Foundation.
MALCOLM M. DAVISSON, J.D., Ph.D., Professor of Economics (Chairman of the Department).
*HOWARD S. ELLIS, Ph.D., Professor of Economics on the Flood Foundation.
*WILLIAM J. FELLNER, Ph.D., Professor of Economics.
ROBERT A. GORDON, Ph.D., Professor of Economics.
EWALD T. GREETHER, Ph.D., Professor of Economics on the Flood Foundation.

* Absent on leave, 1949-1950.

* In residence spring semester only, 1949-1950.

- CHARLES A. GULICK, Ph.D., Professor of Economics.
 2 EMILY H. HUNTINGTON, Ph.D., Professor of Economics.
 MELVIN M. KNIGHT, Ph.D., Professor of Economics.
 CARL LANDAUER, Ph.D., Professor of Economics.
 2 PAUL S. TAYLOR, Ph.D., Professor of Economics.
 LUCY W. STEBBINS, A.B., Litt.D., Professor of Social Economics, Emeritus.
 FRANK L. KIDNER, Ph.D., Associate Professor of Economics (Vice-Chairman of the Department).
 SANFORD A. MOSK, Ph.D., Associate Professor of Economics.
 †EARL R. ROLPH, Ph.D., Associate Professor of Economics.
 WERNER Z. HIRSCH, Ph.D., Instructor in Economics.



- LESLIE E. CARBERT, M.A., Lecturer in Economics.
 PAUL T. ELLSWORTH, Ph.D., Visiting Professor of Economics.
 GRIFFITH C. EVANS, Ph.D., Professor of Mathematics.
 FOREST G. HILL, M.A., Lecturer in Economics.
 ROY W. JASTRAM, Ph.D., Associate Professor of Business Administration.
 JOHN M. LETICHE, M.A., Lecturer in Economics.
 FREDERICK T. MOORE, M.A., Lecturer in Economics.

Upper Division Prerequisites.—For students with a major in economics, courses 1A–1B and 2 are prerequisite to all upper division work in the department unless otherwise specified. For students not majoring in economics, course 1A–1B and junior standing are prerequisite to all upper division work in the department, except for courses where Economics 2 is listed as a specific prerequisite.

Letters and Science List.—All undergraduate courses in economics are included in the Letters and Science List. For regulations governing this list, see page 85.

Preparation for the Major.—Required: courses 1A–1B and 2, and a minimum average grade of C in these courses. Recommended: course 10, Business Administration 1A–1B, and at least an introductory course in another social science (6 units in political science, history, or social institutions preferred). It is recommended that students who intend to make economics their major, and students in the School of Business Administration, complete courses 1A–1B and 2 in the freshman year, and Business Administration 1A–1B in the sophomore year.

The Major.—Required: 24 units of upper division economics. Courses in business administration listed below in the fields of concentration will be accepted in lieu of courses in economics but only when necessary to complete a concentration.

Except under extraordinary circumstances, no more than 9 units of economics and business administration combined may be taken in one semester.

Junior Year: courses 100A–100B (6); 110, 112 or 113 (3); 135 (3).

Senior Year: 9 units in one of the fields of concentration listed below. Courses required to be included in the 9 units in a concentration are indicated by an asterisk.

I. Economic Theory: courses 101A, 101B, 102, 103.

II. Economic History: one course in the group of Economics 110*, 112* and 113* not taken in satisfaction of the junior year requirement listed above; courses 101A, 101B, 152.

† Sabbatical leave in residence, 1949–1950.

* In residence spring semester only, 1949–1950.

- III. Monetary and Fiscal Policy: courses 103, 130A, 130B, 137.
 IV. Labor Economics: courses 150*, 152*; Business Administration 151, 152, 153.
 V. Economic Systems: courses 101B, 106, 110, 117A*, 117B*.
 VI. Industrial Organization and Public Policy: courses 116A*, 116B*, 117B, 122; Business Administration 131.
 VII. Statistics: courses to be selected in consultation with the departmental adviser.
 VIII. International Economic Relations: courses 114, 190A*, 190B*, 197; Business Administration 185.
 IX. Social Economics: courses 150, 180*, 185, 188A, 188B.
 X. Transportation and Public Service Regulation: courses 122, 170A*, 170B, 175; Business Administration 173.

Students majoring in economics shall consult the faculty member responsible for the basic course in their field of concentration regarding their choice of electives. It is recommended that students elect upper division courses in other related social sciences.

The program of each student majoring in economics must be approved by one of the departmental major advisers.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department and in courses in business administration taken in satisfaction of major requirements. Students who do not maintain such an average may be required at any time to withdraw from the major in economics.

LOWER DIVISION COURSES

- 1A-1B. Elements of Economics. (3-3) Yr. Beginning each semester.
 Mr. Cross, Mr. Kidner, Mr. Gordon
 Prerequisite: 1A is prerequisite to 1B.
 Two lectures; one weekly recitation section to be arranged.
 1A. I: Two sections to be given. II: Two sections to be given.
 1B. I: Two sections to be given. II: Two sections to be given.
2. Elementary Statistics. (3) I and II. Mr. Jastram
 (Formerly numbered 40.)
 Two lectures; one discussion meeting; one two-hour laboratory section per week.
 Open to any student with two years of high school algebra or one year of high school algebra and Mathematics D.
 Credit in this course is limited to 2 units for students who have received credit for Education 114 or Psychology 5.
10. Economic History. (3) I and II. Mr. Hill, Mr. Knight
 I: Mr. Hill; II: Mr. Knight.

UPPER DIVISION COURSES

Primarily for undergraduates. Prerequisite for major students in economics: courses 1A-1B, 2, and junior standing; for others, 1A-1B and junior standing except where course 2 is prerequisite for a specific course.

- 100A-100B. Economic Theory. (3-3) Yr. Beginning each semester.
 Mr. Bain, Mr. Carbert, Mr. Fellner, Mr. Hill, Mr. Hirsch,
 Miss Huntington, Mr. Landauer, Mr. Letiche, Mr. Moore
 100A is not open to students taking Business Administration 100;
 100B is not open to students taking Business Administration 101. It is recommended that this course be taken in the junior year. 100A is prerequisite to 100B.
 100A. Five sections to be given each semester.
 100B. I: Four sections to be given. II: Five sections to be given.

- 101A-101B. History of Economic Doctrine. (3-3) Yr. Mr. Brady
102. Advanced Economic Theory. (3) I and II. Mr. Hirsch
Prerequisite: course 100A-100B.
Analysis of the determinants of the aggregate level of output and employment, and of the allocation of resources to specific uses. Includes advanced value and distribution theory, and a brief review of modern monetary theory.
103. Dynamic Economics and Business Fluctuations. (3) I and II. Mr. Kidner
Prerequisite: courses 2, 135, and 100A or Business Administration 100. It is recommended that this course be taken in the senior year.
104. Economic Policy. (3) I and II. Mr. Brady
Discussions in the daily press and periodical literature will be followed. Open to all upper division students who have completed course 1A-1B.
105. Economics of Consumption. (3) II. Miss Huntington
Prerequisite: courses 1A-1B, 2.
A general survey of consumption in the United States, with an analysis of the determination of consumer demands, and of the relation of the consumer to the price system.
106. Social Reform Movements. (3) II. Mr. Landauer
- *110. Economic History Since 1850. (3) I and II. Mr. Knight, Mr. Mosk
Prerequisite: one course in economic history and consent of the instructor.
Economic development since 1850 in the leading industrialized countries.
112. Economic History of Europe. (3) I and II. Mr. Hill, Mr. Knight
I: Mr. Knight; II: Mr. Hill.
113. Economic History of the United States. (3) I and II. Mr. Mosk
114. Economic Problems of Latin America. (3) I and II. Mr. Mosk
115. Economic Problems of the Far East. (3) I. Mr. Knight
- 116A-116B. Industrial Organization and Public Policy. (3-3) Yr.
116A: Mr. Moore; 116B: Mr. Bain. Mr. Bain, Mr. Moore
The economics of large-scale industry, with particular reference to the organization of industrial markets, to price making in these markets, and to public policy toward concentrated industry.
- 117A-117B. Problems of Economic Planning. (3-3) Yr. Mr. Landauer
117A. General theory of economic planning.
117B. Comparative study of economic planning in different countries.
122. Theory of Domestic Trade. (3) II. Mr. Grether
Primarily for seniors.
Prerequisite: course 100A, Business Administration 100, or their equivalents.
The theory of interregional and intraregional movements of trade; the nature of competition in the channels of distribution; an evaluation of the economic consequences of selected marketing activities; the regulation of trade.
- 130A-130B. Public Finance and Taxation. (3-3) Yr. Beginning each semester. Mr. Carbert
135. Money and Credit. (3) I and II. Mr. Cross, Mr. Carbert
Primarily for juniors.
I: Mr. Cross, Mr. Carbert; II: Mr. Cross.

* Not to be given, 1949-1950.

137. Money, Banking, and Monetary Policy. (3) I and II. Mr. Gordon
Prerequisite: course 135.
Analysis of the mechanics of the monetary system of the United States, with studies of monetary systems of other countries; problems involved in monetary management and evaluation of programs for monetary and banking reform.
142. Advanced Statistics. (3) I and II. Mr. Crum
Prerequisite: course 2, consent of the instructor, and adequate mathematical preparation.
150. Labor Economics. (3) I and II. Mr. Gulick, Mr. Taylor
(Formerly numbered 150A.)
I: Mr. Gulick; II: Mr. Taylor.
The social background of labor legislation and trade unionism.
Students will not receive credit for both course 150 and Business Administration 150.
152. Labor Economics. (3) II. Mr. Gulick
(Formerly numbered 150B.)
Prerequisite: course 150 is recommended.
Comparative survey of American and foreign labor movements.
- 170A-170B. Transportation. (3-3) Yr. Mr. Daggett
170A. Inland transportation; a general discussion of the economics of transportation including the inland waterway, the railroad, the street railway, the automobile, and the airplane.
170B. Ocean transportation; historical development of ships and shipping; ocean routes, ports and terminals; rates, documents; legislation; current problems of American shipping. Course 170A is not prerequisite to 170B.
175. The Regulation of Business Affected with a Public Interest. (3) II. Mr. Daggett
The basis of control, administrative and judiciary machinery employed, problems of service, price, competition, and monopoly.
180. Problems of Poverty. (3) I and II. Miss Huntington, ——
I: ——; II: Miss Huntington.
Facts, conditions, and current explanations of poverty; public and private action to prevent destitution; theories concerning minimum standards of living.
- *185. Social Insurance. (3) II. Miss Huntington
An analysis of the theories underlying social insurance and social insurance legislation throughout the world.
- *188A-188B. Population and Migration. (3-3) Yr. ——
Social and economic consequences of population change with special reference to population movements in the past century, determinants of the rate of population growth and decline, the impact of population changes on economic development.
- 190A-190B. International Economic Relations. (3-3) Yr. Beginning each semester. Mr. Condliffe, Mr. Letiche
190A. I: Mr. Condliffe; II: Mr. Letiche. 190B. I: Mr. Letiche; II: Mr. Condliffe.
Fundamental factors in international economic relations.
197. Problems in International Economic Relations. (3) I and II. Mr. Ellsworth, Mr. Letiche
I: Mr. Ellsworth; II: Mr. Letiche.
Prerequisite: course 190A-190B.
Research in problems of international economic policy for advanced undergraduate students.

* Not to be given, 1949-1950.

199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Mr. Kidner in charge)
Designed primarily for seniors on the Honors List of the College of Letters and Science.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 200A-200B. Advanced Economic Theory. (3-3) Yr. Mr. Bain, Mr. Fellner
200A: Mr. Bain; 200B: Mr. Fellner.
- 201A-201B. History of Economic Thought. (3-3) Yr. Mr. Brady
202. Seminar in Advanced Economic Analysis. (3) I and II.
Mr. Ellsworth, Mr. Fellner
I: Mr. Ellsworth: International finance—the theory of capital movements developed in the classical, neoclassical, and more recent literature; historical directions of international investment, its present status, and the International Fund and Bank; international investment and economic progress.
II: Mr. Fellner: National income and the theory of employment.
- 203A-203B. Dynamic Economics and Business Fluctuations. (3-3) Yr.
Mr. Gordon
- *204A-204B. Seminar in Contemporary Economic Theory. (3-3) Yr.
Prerequisite: course 200A-200B.
- 206A-206B. Seminar in Social Reform. (3-3) Yr. Mr. Landauer
- *208. Mathematical Economics. (3) II. Mr. Evans
Prerequisite: Mathematics 121.
- 212A-212B. European Economic History. (3-3) Yr. Mr. Knight
212B, Sec. 2: European economy during the nineteenth and twentieth centuries. Limited to advanced students in economic history aiming at research and teaching in the subject. Admission only by permission of the instructor.
- 213A-*213B. American Economic History. (3-3) Yr. Mr. Mosk
In 1949-1950 course 213A will be given both fall and spring semesters.
- 216A-216B. The Structure of Business Enterprise and Public Policy. (3-3) Yr.
Mr. Bain
Functioning of the industrial sector of an economy geared to large-scale production and responding to prices determined in imperfectly competitive markets. Ownership and entrepreneurial situation created by the large corporation. Implications for public policy.
- *217. Seminar in Economic Planning. (3) I. Mr. Brady
230. Public Finance. (3) I and II. Mr. Rolph
- 235A-*235B. Advanced Money and Credit. (3-3) Yr. Mr. Ellsworth
- *241. Statistical Methods in Social Investigation. (3) II. Miss Huntington
- 250A-250B. Advanced Labor Economics. (3-3) Yr. Mr. Gulick
(Formerly numbered 252A-252B.)
Prerequisite: two courses in labor, including some European labor history, and consent of the instructor. Course 250A is not prerequisite to 250B.
An intensive reading course covering classic and current material.
- 252A-252B. Seminar in Labor Economics. (3-3) Yr. Mr. Gulick, Mr. Taylor
(Formerly numbered 250A-250B.)
Prerequisite: course 150 or Business Administration 150 and consent of the instructor.
252A. I: Mr. Gulick; II: Mr. Taylor. 252B. II: Mr. Gulick.

* Not to be given, 1949-1950.

- 290A-290B. Principles of International Economic Relations. (3-3) Yr.
Prerequisite: course 190A-190B. Mr. Condliffe
History and literature of the theory of international trade and commercial policy and their application to current international economic questions.
291. Research in International Economic Relations. (3) I and II.
Mr. Condliffe
Research on current problems of international economic interest.
298. Research. (1-6) I and II. Mr. Fellner, Mr. Gordon
I: Mr. Gordon; II: Mr. Fellner.
Open to candidates for the Ph.D. degree who have passed the qualifying examination and who are engaged in research for the thesis, and in special cases, with the approval of the instructor in charge, to qualified graduate students who desire to do special work in a particular field.

EDUCATION

- EDNA W. BAILEY, Ph.D., Professor of Education and Associate Director of Supervised Teaching.
- GUY T. BUSWELL, Ph.D., Professor of Education.
- HAROLD D. CARTER, Ph.D., Professor of Education.
- LUTHER C. GILBERT, Ph.D., Professor of Education (Acting Chairman of the Department).
- GEORGE C. KYTE, Ed.D., Professor of Education.
- EDGAR MORPHET, Ph.D., Professor of Education.
- THEODORE L. RELLE, Ph.D., Professor of Education.
- DAVID H. RUSSELL, Ph.D., Professor of Education and Associate Director of Supervised Teaching.
- FRANK N. FREEMAN, Ph.D., D.Sc., Professor of Educational Psychology, Emeritus.
- FRANK W. HART, Ph.D., LL.D., Professor of Education, Emeritus.
- MERTON E. HILL, Ed.D., Professor of Education, Emeritus.
- GEORGE A. RICE, Ed.D., Professor of Education, Emeritus.
- L. A. WILLIAMS, Ph.D., Professor of Education, Emeritus.
- S. E. TORSTEN LUND, Ph.D., Associate Professor of Education.
- JOHN U. MICHAELIS, Ph.D., Associate Professor of Education and Director of Supervised Teaching.
- J. CECIL PARKER, Ed.D., Associate Professor of Education.
- ² LARS H. PETERSON, Ph.D., Associate Professor of Education.
- FREDERICK T. TYLER, Ph.D., Associate Professor of Education.
- GLENN E. BARNETT, Ed.D., Assistant Professor of Education.
- ARTHUR H. BRAYFIELD, Ph.D., Assistant Professor of Education.
- WATSON DICKERMAN, Ph.D., Assistant Professor of Education.
- R. BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.
- FREDERIC LILGE, Ph.D., Assistant Professor of Education.
- RICHARD D. MOSIER, Ph.D., Assistant Professor of Education.
- SIDNEY S. SUTHERLAND, M.S., Assistant Professor of Education and Supervisor of Teacher-Training in Agriculture, at Davis.
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- FRANKLIN CARTER, Lecturer in Musical Education and Supervisor of the Teaching of Music.
- CLINTON C. CONRAD, Ph.D., Lecturer in Education and Associate Director of Supervised Teaching.

² In residence spring semester only, 1949-1950.

- ENOCH DUMAS, Ed.D., Lecturer in Education, Acting Associate Director of Supervised Teaching, and Supervisor of Elementary Education.
 LAURENCE F. FOSTER, Ph.D., Lecturer in Education and Supervisor of Audio-Visual Teaching.
 MABEL F. GIFFORD, Lecturer in Special Education for the spring semester.
 GAIL E. MOORE, M.Ed., Lecturer in Education for the fall semester.
 ILMA BADGLEY OATMAN, M.S., Lecturer in Education and Supervisor of the Teaching of Home Economics.
 BLAKE W. SPENCER, M.A., Lecturer in Education.
 HERMAN A. SPINDT, Ph.D., Lecturer in Education.



- MARION AVERY, A.B., Supervisor of the Teaching of Physical Education for Girls.
 DONETTA C. BRAINARD, A.B., Assistant Supervisor of the Teaching of English.
 ROBERT E. BROWNLEE, A.B., Resident Supervisor, Oakland Technical High School.
 GEORGE J. BURKHARD, M.A., Principal of the University Elementary School.
 TANNA DE LA TORRE, A.B., Assistant Supervisor of the Teaching of Foreign Language.
 JOHN FRENCH, M.A., Supervisor of Art Education in the Elementary School.
 RUBY L. HILL, M.A., Principal, Washington School, Oakland.
 HARRY H. HINDMAN, A.B., Supervisor of the Teaching of Physical Education for Boys.
 M. RAY HITCH, M.A., Supervisor of the Teaching of Business Administration.
 JAMES W. HOGE, M.A., Supervisor of the Teaching of Mathematics.
 KATHARYN HOLE, Supervisor of the Teaching of Drawing.
 WILLIAM W. KIDDER, A.B., Assistant Supervisor of Audio-Visual Education.
 WALTER D. LOBAN, Ph.D., Supervisor of the Teaching of English.
 ANNE F. MERRILL, M.A., Elementary Supervisor.
 LORRAINE H. MILLER, A.B., Supervisor of Music in the Elementary School.
 ADELE OGDEN, Ph.D., Supervisor of the Teaching of Social Studies in the High School.
 THOMAS C. POLSON, Ph.D., Supervisor of the Teaching of Science.
 MARGARET RYAN, M.A., Assistant Supervisor of Speech Correction.
 LESLIE SMITH, M.A., Principal, Claremont Junior High School, Oakland.
 JOSIE W. STEWART, M.A., Supervisor of the Teaching of Kindergarten Work.
 OLIVE STEWART, M.S., Supervisor of the Teaching of Social Studies.
 PORTIA F. WAGENET, A.B., Supervisor of the Teaching of Physical Education for Girls.
 ROSALIE V. ZARI, A.B., Supervisor of Junior High School Elementary Education.

Letters and Science List.—Courses 108, 110, and not more than 3 units from 101, 102, and 105 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Chairman of the Department.

Preparation for the Major.—Psychology 1A and Zoölogy 10, and not less than 6 units in economics (preferably 1A-1B) or political science (preferably 1, 2) or social institutions (preferably 10A-10B) or philosophy (preferably 6A-6B).

The Major.—The major here described is the 24-unit major for the A.B. degree in the College of Letters and Science. A major in education is not an acceptable major for a Certificate of Completion of the teacher-training curricula.

Required: 18 units in education including the following 11 units: Education 101, 106, 110, 119, and a sequence of courses consisting of one of the following groups with additional courses from the remaining groups sufficient to make a total of 7 units.

- I. History of Education 102; 105.
- II. Educational Psychology 111; 113, 115, 116, 117, or 118.
- III. Elementary Education 118; 130; 134 or 138.
- IV. Educational Organization and Administration 141; 142; 145.
- V. Vocational Education 160; 161; 164.
- VI. Secondary Education 170; 117 or 172.
- VII. Social Education 111; 107.

The remaining 6 units may be chosen, with the approval of the department, from upper division courses in the Letters and Science List in the following departments: Economics, Education, History, Philosophy, Political Science, Psychology, or Zoölogy. Students who transfer from normal schools or teachers colleges will not be permitted to elect courses in education for these 6 units. It is recommended that students include Philosophy 104 in the major program. Courses numbered in the 300 series are not accepted toward the major for the A.B. degree.

The department will certify to the completion of a major for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain this average may be required at any time to withdraw from the major in education.

TEACHER-TRAINING CURRICULA

Special provision is made for the professional training of teachers of three classes:

A. Those preparing to become teachers in elementary and secondary schools or in colleges.

B. Those preparing to engage in school administration, to become principals or superintendents of public schools, or to teach in normal schools or in college departments of education.

C. Graduates of normal schools, who are making further preparation for supervisory or administrative positions in elementary schools.

For detailed requirements see ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

For courses offered at Davis see PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

UPPER DIVISION COURSES

Prerequisite: junior standing and Psychology 1A or equivalent.

101. The History of Education—General Course. (3) I and II.

Mr. Lilge, Mr. Mosier

The development of educational thought and practice viewed as a phase of social progress.

102. The History of American Education. (2) I.

Mr. Mosier

The leading ideas and ideals of American education and the institutions in which they have been embodied.

105. Education in Foreign Countries. (2) I.

Mr. Lilge

Education as an instrument of political power and propaganda; its dependence on national cultural traditions. Especially valuable to students pursuing the study of a specific region.

106. Philosophy of Education. (2) I and II.

Mr. Lilge, Mr. Mosier

The great educational classics and their meaning for modern man.

107. The School in the Social Order. (2) II.

Mr. Mosier

A study of the interrelations of the school and society, of the complexity

- of culture in which education functions, and of the political and social relations of the school in contemporary American society.
108. The Professions and Modern Society. (2) II. Mr. Lilje
The professions as cultural associations; professional training and liberal education; the relation of specialized knowledge to social action and leadership; social implications of philosophies of education.
110. Introduction to Educational Psychology. (3) I and II. Mr. Buswell, Mr. H. D. Carter, Mr. Tyler
Original nature and tendencies of man; the learning process; individual differences and their measurement.
111. Growth and Development of Children. (2) I and II. Mrs. Bailey
Prerequisite: course 110 or Psychology 2.
The processes through which the normal human being reaches maturity, acquires effective use of his bodily equipment and learning capacity, and makes satisfactory personal and social adjustments. Directed observation of normal children.
112. The Improvement of Reading. (2) I. Mr. Buswell
Psychology of learning as it relates to effective reading readiness program, development of word meaning, organization and analysis, improvement of comprehension, recall, skimming and speed reading, study skills and higher mental processes, provision for individual differences in ability and interest, place of skills in modern reading program.
113. Individual Tests in Guidance. (2) I. _____
Prerequisite: 6 units in psychology or educational psychology.
114. Statistical Methods in Education. (2) I. Mr. H. D. Carter
Prerequisite: course 110. Mathematics D is also recommended.
- *115. Objective Tests and Measurements. (2) I. Mr. H. D. Carter
Prerequisite: courses 110 or equivalent, and 114.
Principles and functions of measurement in education; varieties of measurement in common use; the construction and validation of objective examinations; the improvement of school marks.
116. The Exceptional Child. (2) I and II. _____
Prerequisite: course 110 or a course in psychology additional to Psychology 1A.
117. Psychology of High School Subjects. (2) I and II. Mr. Gilbert
Prerequisite: course 110.
118. Psychology of Elementary School Subjects. (2) I and II. Mr. Russell
Prerequisite: courses 110, 130.
119. Standard Tests in Education. (3) I and II. Mr. H. D. Carter
A critical survey and evaluation of standard tests, including achievement and psychological tests available for school purposes; practice in giving and scoring tests, and interpreting results for the improvement of instruction; organization of a testing program.
124. Principles of Curriculum Development. (2) I. Mr. Parker
Prerequisite: courses 130 or 170, 110, 111.
Principles underlying the development of curricula on the elementary and secondary levels.
127. Principles of Teaching the Slow Learner. (2) II. _____
Prerequisite: teaching experience.
Principles of adapting the curriculum, materials, and methods of teaching to the needs of the mentally handicapped child. This course may be counted toward the special credential for working with mentally retarded children.

* Not to be given, 1949-1950.

130. Elementary Education. (3) I and II. Mr. Barnett
Prerequisite: course 110 (completed or taken concurrently).
Limited to candidates for the elementary teaching credential, for the general administrative credential, and for the doctor's degrees.
131. Arithmetic and Language in the Elementary School. (2) I. Mr. Kyte
Prerequisite: courses 110 and 130.
Objectives, standards of attainment, and types of instruction in arithmetic, oral and written English, spelling, and penmanship; diagnostic and remedial techniques; criteria for selection, placement, and organization of the contents of these subjects.
132. Art and Music in the Elementary School. (2) I and II.
Mr. Dumas, Mr. Barnett, and Supervisory Staff
Prerequisite: courses 110 and 130.
Enrollment limited to facilities available.
Functions, organization, instructional planning, implications of research in child development for teaching and selection of materials, and evaluation of educational outcomes in the art and music curricula in elementary schools.
134. Reading and Literature in the Elementary School. (2) I and II.
Prerequisite: courses 110 and 130. Mr. Russell
Objectives, standards of attainment, types of reading instruction, diagnostic and remedial techniques, reading readiness, place of reading in the activity program. Introduction to children's literature, children's interests in reading, criteria for selection of content, the place of supplementary and library reading.
138. Social Studies in the Elementary School. (2) I and II. Mr. Michaelis
Prerequisite: courses 110 and 130.
Aims, content, and outcomes; unified social studies versus separate courses; critical analysis of typical units and courses of study; selection, sequence, and organization of units; the place of textbooks and supplementary materials; relation to the Three R's, the arts, and elementary sciences.
- *140. The Teacher and Administration. (2) II. Mr. Reller
141. The Administration of City School Systems. (2) II. Mr. Morphet
142. The Administration of State School Systems. (2) I. Mr. Morphet
145. Problems in Public School Finance and Business Administration. (2) I.
Mr. Morphet
Prerequisite: courses 140, 141, and 142, and teaching experience.
148. Public Education in California. (2) II. Mr. Morphet
Organization and administration of the California school system, as given in the school law of the State and as interpreted by the rulings of the State Superintendent of Public Instruction and the Attorney General.
149. See under *Special Education*, page 262.
151. Administration of the School Health Program. (2) I and II. Mrs. Bailey
Organization and administration of school health work; public health aspects of school hygiene in relation to school physician, nurse, principal, and teachers.
- *152. Health Problems in the Secondary Schools. (2) I. Mrs. Bailey
- *153. Mental Hygiene—Elementary. (2) I. _____
Prerequisite: course 110.
A basic course concerned with problems of childhood.

* Not to be given, 1949-1950.

- *154. Mental Hygiene—Advanced. (2) I. _____
Prerequisite: course 153 or its equivalent.
160. Vocational Education. (2) I. Mr. Moore
Philosophy and organization of vocational education of less than college grade, with particular reference to principles underlying education for industry, agriculture, commerce, homemaking, and continuation education.
161. Occupational and Educational Information. (2) I. Mr. Brayfield
Lecture and laboratory.
Labor market organization and dynamics; job analysis and community occupational surveys; investigation of training opportunities. Sources and interpretation of data.
162. Occupational Testing. (2) I. Mr. Brayfield
Prerequisite: course 114 or 119.
Theory and practice in occupational testing; emphasis upon aptitude, interest, and personality measures; validity, reliability, and normative data. Supervised work in test administration, scoring, and interpretation.
164. Introduction to Student Personnel Work. (2) I and II. Mr. Brayfield
Nature and scope of the student personnel program in schools and colleges; role of teacher, counselor, and administrator. Survey of basic tools and techniques.
165. Business Education in Secondary Schools. (3) I and II. Mr. Spencer
This course is prerequisite to 320E, Section 13.
166. Home Economics Education. (3) I and II. Mrs. Oatman
Designed for teachers, student dietitians, and nutritionists in public health.
170. Second Education. (2) I and II. Mr. Lund
Prerequisite: courses 110 and 111; ordinarily juniors will not be admitted. (These requirements will be administered without exception for all University of California students. Graduates from other institutions may take the prerequisites together with the course, but are advised that this will be a decided handicap.)
172. Junior High School Education. (2) II. Mr. Lund
Prerequisite: course 110 (may be taken concurrently).
181. Adult Education. (2) I and II. Mr. Dickerman
A general overview of the field of adult education.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Gilbert in charge)

GRADUATE COURSES

As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation will consist normally of the completion of at least 12 units of upper division work basic to the subject of the graduate course.

The admission of undergraduates to graduate courses is limited to seniors who have an average grade of at least B in the basic courses; the study-list limits in such cases are the limits imposed by the rules of the Graduate Division.

200. Research Techniques. Seminar. (2) I and II. Mr. Buswell, Mr. H. D. Carter
- 201A-201B. History of Education. Seminar. (2-2) Yr. Mr. Moiser
Admission on consultation with instructor.
- 206A-206B. Philosophy of Education. Seminar. (2-2) Yr. Mr. Lilge

* Not to be given, 1949-1950.

- 210A-210B-210C. Advanced Educational Psychology. (2-2-2). Mr. Tyler
Prerequisite: courses 110 and 114.
210A. Individual Differences; 210B-210C. Psychology of Learning
210A and 210B are given in the fall semester.
212. Analysis of Difficulties in Reading and Language Arts. (2) II.
Mr. Gilbert
- *214. Advanced Statistics with Application to Methods of Educational
Investigation. (2) I. Mr. H. D. Carter
Prerequisite: a course in elementary statistics and consent of the in-
structor.
- 216A-216B. Educational Psychology. Seminar. (2-2) Yr.
Mr. H. D. Carter, Mr. Gilbert, Mr. Tyler
In addition to the general sessions, the seminar will meet in groups
according to the interests of those enrolled, under the supervision and
direction of Mr. H. D. Carter, Mr. Gilbert, or Mr. Tyler.
217. Experimental Education. (2) I and II. Mr. Gilbert
Admission on consultation with the instructor.
Laboratory experiments, with special reference to the more elaborate
techniques applied to the various school subjects. The course includes voice
recording, photographing eye movements in reading and spelling, analysis
of rhythm in reading, arithmetic, and writing, and studies of the motor
responses accompanying appreciation. Each member of the class will par-
ticipate in all experiments.
218. Investigation in Language Arts Education. (2) I and II. Mr. Russell
Prerequisite: consent of the instructor.
Examinations of research studies, courses of study, and major innova-
tions; assistance to students who wish to work on individual problems.
- 224A-224B. School Curricula. Seminar. (2-2) Yr. Mr. Parker
Admission only on consultation with the instructor.
226. Curriculum Construction. (2) II. Mr. Parker
227. Problems in Curriculum Development. Practicum. (2) I and II.
Mr. Parker
Prerequisite: two courses in elementary and/or secondary curriculum,
teaching experience, graduate standing, and consent of the instructor.
Designed especially for administrators, supervisors, teachers in elemen-
tary and secondary schools, and county officers who have problems in
curriculum development.
- 230A-230B. Elementary Education. Seminar. (2-2) Yr. Mr. Barnett
Prerequisite: 12 units in education with teaching experience and con-
sent of the instructor.
231. Administration of Elementary Education. Practicum. (2) I. Mr. Kyte
Admission on consultation with the instructor.
- 232A-232B. The Elementary School Curriculum. Seminar. (2-2) Yr.
Admission on consultation with the instructor. Mr. Russell
- 233A-233B. Supervision of Elementary Education. Practicum. (2-2) Yr.
Admission on consultation with the instructor. Mr. Kyte
- 234A-234B. Supervision of Elementary Education. Seminar. (2-2) Yr.
Admission on consultation with the instructor. Mr. Kyte
235. The Elementary School Curriculum. (2) II. Mr. Kyte
Admission on consultation with the instructor.
- 240A-240B. Educational Administration. Seminar. (2-2) Yr.
Mr. Peterson, Mr. Reller, Mr. Morphet
Admission on consultation with the instructor.

* Not to be given, 1949-1950.

244. Problems in Schoolhousing. (2) I and II. Mr. Reller, Mr. Morphet
Prerequisite: course 248A-248B or extensive experience in school administration.
- 248A-248B. Educational Administration. (2-2) Yr. Mr. Peterson, Mr. Reller
Prerequisite: 12 units of education or extensive teaching and administrative experience.
Intended to serve the fundamental needs of state, county, and city superintendents or other school administrative officers.
- 249A-249B. School Surveys. Practicum. (2-2) Yr. Mr. Peterson, Mr. Reller
Limited to students enrolled in course 248A-248B.
Training in the practical application of the principles and technique developed in the companion course (248A-248B) including additional field work equivalent to two hours per week. Opportunity to organize and participate in the conduct of school surveys and field studies.
- 258A-258B. Seminar in Social Studies Education. (2-2) Yr. Mr. Michaelis
Prerequisite: consent of the instructor.
Research on problems in social studies education for advanced students.
- 260A-260B. Seminar in Student Personnel Work. (2-2) Yr. Mr. Brayfield
Prerequisite: course 164 and consent of the instructor.
Research in the field of student personnel.
264. Organization and Administration of Student Personnel Services. (2) II. Mr. Brayfield
Prerequisite: course 164 and consent of the instructor.
Allocation of functional responsibilities; staff and line relationships; individual and group methods. Problems of budgeting, staffing, and equipping the program; record keeping and office management. Coordination of institutional and community resources.
267. Advanced Counseling. (2) II. Mr. Brayfield
Prerequisite: course 162 and consent of the instructor.
Psychological foundations of counseling; diagnostic procedures and treatment; evaluation of counseling. Illustrative case materials.
- 270A-270B. Secondary Education. Seminar. (2-2) Yr. Mr. Lund
Admission on consultation with the instructor.
- 272A. Secondary School Curriculum: Basic Principles. (2) I. Mr. Parker
Prerequisite: courses 110, 111, 170, or their equivalents, graduate standing, and consent of the instructor.
- 272B. Secondary School Curriculum: Techniques of Curriculum Making. (2) II. Mr. Parker
Prerequisite: course 272A, graduate standing, and consent of the instructor.
273. Supervision in Secondary Schools. (2) II. Mr. Lund
Prerequisite: course 130 or 170, teaching experience, and consent of the instructor.
275. Secondary Education: Survey. (2) I. Mr. Lund
Survey and critical review of secondary education literature, including research studies, yearbooks, reports, and other documents. Admission on consultation with the instructor.
276. The Administration of Secondary Education. Practicum. (2) II. Mr. Morphet
Prerequisite: courses 170 and 141 or 142.
279. The Junior College. Practicum. (2) I and II. Mr. Spindt

281. Adult Education. Seminar. (2) I and II. Mr. Dickerman
Open only to graduate students who have completed course 181 or who have had equivalent study or experience.
284. Counseling, Child Welfare, and Parent Education. (2) I. Mrs. Bailey
For counselors, supervisors of attendance and child welfare, and school administrators.
285. Social Development of Children and Youth. (2) II. Mrs. Bailey
Admission on consultation with the instructor.
- *290. Biological Foundations of Education. (2) I. Mrs. Bailey
298. Directed Research. Seminar. (2-4) I and II.
The Staff (Mr. Gilbert in charge)
Admission only with consent of instructor in charge.
Open only to candidates for the Ph.D. and Ed.D. degrees who have passed the departmental qualifying examinations and who present an approved plan of research, and in special cases, to students who present evidence of qualifications and approved plans for carrying on a particular type of research.

Supervised Teaching

320. Supervised Teaching, Professional Methods. I and II.
Mr. Michaelis, Mrs. Bailey, Mr. Conrad, Mr. Dumas, Mr. Russell, and Supervisory Staff
The University of California will accept for teacher training those candidates who meet the requirements set up by the State Department of Education in health including specifically sight and hearing; the University of California will not admit to teacher training in Education 320C, inexperienced applicants who are over 35 years of age. Students must have at least a 1.50 average in the work of the upper division and those who are working for the General Secondary Credential must have at least a 1.75 average in the teaching major, and those who are working for the General Elementary Credential must have at least a 1.00 average in the teaching major in order to enroll in courses 320C and 320E.
- 320A. Introduction to Teaching. (1) I and II.
Mr. Michaelis, Mr. Barnett, Mr. Dumas
Lectures, conferences, laboratory, and field work.
Observations and participation in some form of public school work. It is strongly recommended that students reserve at least a two-hour period for field work at least three times a week. Application for admission to course 320A, Sections 1 and 2, must be made in Room 107, Haviland Hall, not later than November 1, 1949, for the spring semester, 1950, and not later than April 1, 1950, for the fall semester, 1950. Enrollment is limited to available facilities.
Sec. 1 (Secondary), Mr. Michaelis; Sec. 2 (Elementary), Mr. Dumas, Mr. Barnett, assisted by supervisors and members of the Curriculum Laboratory Staff.
- 320B. Audio-Visual, Radio, and Other Instructional Resources. (2) I and II.
Mr. Foster, Mr. Polson
Lectures, conferences, demonstrations, laboratory, and school experiences.
- 320C. Supervised Teaching.† (3) I and II.
Mr. Michaelis, Mr. Conrad, Mr. Dumas, and Supervisory Staff
Prerequisites depend upon the type of credential desired: For Junior

* Not to be given, 1949-1950.

† Students must have at least a 1.50 average in the work of the upper division and those who are working for the General Secondary Credential must have at least a 1.75 average in the teaching major, and those who are working for the General Elementary Credential must have at least a 1.00 average in the teaching major in order to enroll in courses 320C and 320E.

College Credential: courses 110 and 279 or 170, 320A, and 320B; for Secondary Credential: courses 110, 111, 170, 320A, and 320B; for General Junior High School Credential and General Elementary School Credential: courses 110, 111, 130, 131, 132, 134, 138, and 320A. Required in addition: a grade-point average of 1.50 or higher in the work of the junior and senior years, and a bachelor's degree.

Applications for enrollment in course 320C must be made at Room 107, Haviland Hall, not later than November 1, 1949, for the spring semester, 1950, and not later than April 1, 1950, for the fall semester, 1950. Enrollment is limited to available facilities.

Candidates who are graduates of institutions other than the University of California must submit two transcripts of record at the time of application.

320E. Methods of Teaching.† (2) I and II.

Mr. Michaelis and Supervisory Staff

Lectures, conferences, and laboratory.

All students enrolled in 320C or 324 or 326 must carry concurrently one of the following sections:

Sec. 1. Agriculture (at Davis) Mr. Sutherland

Sec. 2. Life Science and Physical Science. Mr. Polson

Sec. 3. Mathematics. Mr. Hoge

Sec. 4. English. Mr. Loban

Sec. 5. Foreign Languages. Miss de la Torre

*Sec. 6. Latin.

Sec. 7. Social Studies. Miss Ogden, Miss Stewart

Sec. 8. Physical Education for Men. Mr. Hindman

Sec. 9. Physical Education for Women. I. Miss Wagenet

Sec. 10. Art. Miss Hole

Sec. 11a. Homemaking (at Berkeley); 11b. Homemaking (at Davis).

Recommended: course 166. Mrs. Oatman

Sec. 12. Public School Music. Mr. F. Carter

Sec. 13. Business Education. Mr. Hitch

Course 165 is prerequisite to supervised teaching in business education.

*Sec. 14. German.

Sec. 15. General Junior High School or General Elementary School.

Mr. Dumas and Supervisory Staff

Restricted to candidates for the General Junior High School Credential or General Elementary School Credential.

Sec. 16. Junior College. Mr. Conrad

*Sec. 17. Special Education.

Admission on approval of instructor. Hours to be arranged.

School Library Administration (Librarianship 206). Miss Boyd

A course in school library administration is required of all candidates applying for Special Secondary Credential in Public School Librarianship. This course must be taken in addition to course 320E to fulfill the requirements for the General Secondary Credential.

321. Supervised Teaching: Materials of Instruction and Class Management.

(2) I and II.

Mr. Dumas, Miss Merrill, Mrs. Zari

Prerequisite: courses 110, 111, 132, 130, 131, 134, 138, and 320A, and

† Students must have at least a 1.50 average in the work of the upper division and those who are working for the General Secondary Credential must have at least a 1.75 average in the teaching major, and those who are working for the General Elementary Credential must have at least a 1.00 average in the teaching major in order to enroll in courses 320C and 320E.

* Not to be given, 1949-1950.

a bachelor's degree. Open only to students who plan to complete requirements for the Recommendation for the General Junior High School Credential or the General Elementary Credential. Course 321 must be taken concurrently with course 320C.

Instructional materials and their use in the elementary school program; industrial arts activities; audio-visual materials and other learning aids in the classroom.

- *322. *Methods and Practice in Adult Education.* (4) II. Mr. Dickerman
Prerequisite: course 181 or experience in adult education.
The course may be offered in partial fulfillment of the requirements of the State Board of Education for the Special Secondary Credential in Adult Education.
323. *Practicum in Supervised Teaching.* (2-4) I and II. Mr. Conrad
Sec. 1, Mr. Conrad; Sec. 2 (at Davis), Mr. Sutherland.
Prerequisite: course 320C, or experience as a teacher and consent of the instructor. Candidates who are graduates of other institutions must submit two transcripts of record at the time of application.
An opportunity to obtain more extended and varied experience under supervision.
324. *Practicum in Supervised Teaching.* (4) I and II. Mr. Conrad
Prerequisite: course 279, or 170, which may be taken concurrently if circumstances require, or an equivalent course if previously taken. Course 320E, Sec. 16, must be taken concurrently. Open only to candidates for the Junior College Credential who are teaching assistants employed by the University.
325. *Field Work in Student Personnel Services.* (2) II. Mr. Brayfield
Prerequisite: courses 164, 267, and consent of the instructor.
Supervised field work in schools and other community agencies.

Special Education

- *149. *Administration, Organization, and Procedures in Special Education.* (2) I.
- *326. *Supervised Teaching in Special Education.* (4) II.
The Staff in Special Education
Prerequisite: course 149, which may be taken concurrently if circumstances require. Course 320E, Sec. 17, must be taken concurrently with 326. Open only to candidates for a credential in special education and only after consultation with the instructor in charge of the course.
370. *Basic Speech Development.* (2) II. Mrs. Gifford
Prerequisite: course 110.
Designed to familiarize classroom teachers and administrators with the development of normal speech. Methods and procedures for preventing poor and defective speech habits in children.
- *379. *Educational Treatment of Cerebral Palsied Children.* (2) II. _____
Admission only on consultation with the instructor.

COURSES IN OTHER DEPARTMENTS ACCEPTED AS ELECTIVES FOR CREDENTIAL IN EDUCATION

- English 300. *Problems in Teaching English Literature and Composition in Secondary Schools.* (2) I and II.
- Librarianship 206. *School Library Administration.* (2) II.
- Mathematics 107. *Mathematics in Secondary Schools.* (2) I.
- Music 300A. *Choral Literature for Secondary Schools.* (2) I.

* Not to be given, 1949-1950.

- Music 300B. Instrumental Literature for Secondary Schools. (2) II.
Music 328. Methods of Teaching Vocal Techniques. ($\frac{1}{2}$) I and II.
Music 329A. Methods of Teaching Stringed Instruments. (1) I and II.
Music 329B. Methods of Teaching Brass Instruments. (1) I.
Music 329C. Methods of Teaching Wood-Wind Instruments. (1) II.
Music 445D. Bassoon. ($\frac{1}{2}$) I and II.
Music 455A. French Horn. ($\frac{1}{2}$) I and II.

ENGINEERING

- EVERETT D. HOWE, M.S., Professor of Engineering.
MORROUGH P. O'BRIEN, B.S., Professor of Engineering (Chairman of the Department).
HERBERT V. WILEY, B.S., Lecturer in Engineering.

CIVIL ENGINEERING

- HARMER E. DAVIS, M.S., Professor of Civil Engineering (and Director of the Institute of Transportation and Traffic Engineering).
RAYMOND E. DAVIS, C.E., D.Eng., Professor of Civil Engineering and Director of the Engineering Materials Laboratory.
HOWARD D. EBERHART, M.S., Professor of Civil Engineering.
FRANCIS S. FOOTE, E.M., Professor of Railroad Engineering.
HAROLD B. GOTAAS, Sc.D., Professor of Sanitary Engineering (Chairman of the Division).
BRUCE JAMEYSON, B.S., Professor of Civil Engineering.
JOE W. KELLY, B.S., Professor of Civil Engineering.
WILFRED F. LANGELIER, M.S., Professor of Sanitary Engineering.
RALPH A. MOYER, M.S., C.E., Professor of Civil Engineering.
GEORGE E. TROXELL, B.S., Professor of Civil Engineering.
CLEMENT T. WISKOCIL, C.E., Professor of Civil Engineering.
CHARLES DERLETH, JR., C.E., LL.D., Professor of Civil Engineering, Emeritus.
CHARLES G. HYDE, B.S., LL.D., Professor of Sanitary Engineering, Emeritus.
TUNG-YEN LIN, M.S., Associate Professor of Civil Engineering.
HARVEY F. LUDWIG, M.S., Associate Professor of Civil Engineering.
EGOR P. POPOV, Ph.D., Associate Professor of Civil Engineering.
BORIS BRESLER, M.S., Assistant Professor of Civil Engineering.
RAY W. CLOUGH, JR., Sc.D., Assistant Professor of Civil Engineering.
ERMAN A. PEARSON, Sc.D., Assistant Professor of Civil Engineering.
BERNARD A. VALERGA, M.S., Assistant Professor of Civil Engineering.
JOHN H. JONES, M.S., Instructor in Civil Engineering.
MILOS POLIVKA, M.S., Instructor in Civil Engineering.
ALEXANDER C. SCORDALIS, B.S., Instructor in Civil Engineering.



- NED P. CLYDE, M.S., Lecturer in Civil Engineering.
ALEXANDER KLEIN, M.S., Lecturer in Civil Engineering.
¹ DIMITRI P. KRYNINE, C.E., Visiting Professor of Civil Engineering.
GEORGE D. MEIXNER, B.S., Lecturer in Civil Engineering.

¹ In residence fall semester only, 1949-1950.

- ARNOLD OLITT, B.S., Lecturer in Civil Engineering.
 DAVID PIRTZ, B.S., Lecturer in Civil Engineering.
 BERNARD D. TEBBENS, Sc.D., Associate Professor of Industrial Hygiene Engineering.
 RICHARD J. WOODWARD, JR., M.S., Lecturer in Civil Engineering.

ELECTRICAL ENGINEERING

- CHARLES F. DALZIEL, E.E., Professor of Electrical Engineering.
 THOMAS C. MCFARLAND, M.S., Professor of Electrical Engineering (Chairman of the Division).
 LAURISTON C. MARSHALL, Ph.D., Professor of Electrical Engineering.
 LESTER E. REUKEMA, Ph.D., Professor of Electrical Engineering.
 BURTIS L. ROBERTSON, Ph.D., Professor of Electrical Engineering.
 LEONARD J. BLACK, Ph.D., Associate Professor of Electrical Engineering.
 DAN M. FINCH, B.S., Associate Professor of Electrical Engineering.
 PAUL L. MORTON, Ph.D., Associate Professor of Electrical Engineering.
 HERBERT J. SCOTT, E.E., Associate Professor of Electrical Engineering.
 SAMUEL SILVER, Ph.D., Associate Professor of Electrical Engineering.
 DAVID H. SLOAN, Ph.D., Associate Professor of Electrical Engineering.
 OTTO J. M. SMITH, Ph.D., Associate Professor of Electrical Engineering.
 JOHN R. WHINNERY, B.S., Associate Professor of Electrical Engineering.
 JOHN R. WOODYARD, Ph.D., Associate Professor of Electrical Engineering.
 WILTON R. ABBOTT, Ph.D., Assistant Professor of Electrical Engineering.
 TROY D. GRAYBEAL, D.Eng., Assistant Professor of Electrical Engineering.



- JOHN D. AXTELL, B.S., Lecturer in Electrical Engineering.
 SCOTT BEAMER, B.S., Lecturer in Electrical Engineering.
 DWIGHT W. BREDE, M.S., Lecturer in Electrical Engineering.
 DAVID R. BROWN, M.S., Lecturer in Electrical Engineering.
 ROBERT A. BRUNS, M.S., Lecturer in Electrical Engineering.
 MORRIS J. EHRlich, M.S., Lecturer in Electrical Engineering.
 WILLIAM R. FAIR, M.S., Lecturer in Electrical Engineering.
 JAMES R. FREEMAN, B.S., Lecturer in Electrical Engineering.
 JOSEPH T. GIER, M.S., Lecturer in Electrical Engineering.
 SWEGN D. HAMREN, B.S., Lecturer in Electrical Engineering.
 KARL HINRICHs, M.S., Lecturer in Electrical Engineering.
 WEI-GUAN LIN, M.S., Lecturer in Electrical Engineering.
 WILLIAM E. NORRIS, B.S., Lecturer in Electrical Engineering.
 JOHN H. PRIEDIGKEIT, B.S., Lecturer in Electrical Engineering.
 WILSON S. PRITCHETT, M.S., Lecturer in Electrical Engineering.
 ROBERT M. SAUNDERS, M.S., Lecturer in Electrical Engineering.
 WILLIAM E. STONEY, M.S., Lecturer in Electrical Engineering.
 GEORGE K. TAJIMA, M.S., Lecturer in Electrical Engineering.
 GEORGE F. TEALE, B.S., Lecturer in Electrical Engineering.
 FERDINAND VOELKER, B.S., Lecturer in Electrical Engineering.

ENGINEERING DESIGN

- CLYNE F. GARLAND, M.S., Professor of Engineering Design (Chairman of the Division).
 ALEXANDER S. LEVENS, M.S., C.E., Professor of Engineering Design.

JAMES L. MERIAM, Ph.D., Associate Professor of Engineering Design.
 WALTER W. SOROKA, Sc.D., Associate Professor of Engineering Design.
 DON M. CUNNINGHAM, M.S., Assistant Professor of Engineering Design.
 FRED HIRSCH, M.S., Assistant Professor of Engineering Design.
 CARL W. NELSON, Ph.D., Assistant Professor of Engineering Design.
 CYRIL P. ATKINSON, B.S., Instructor in Engineering Design.
 JOHN A. CLAWSON, B.S., Instructor in Engineering Design.
 WERNER GOLDSMITH, M.S., Instructor in Engineering Design.
 WILLIAM W. HOWE, A.B., Instructor in Engineering Design.



CLINTON J. ANCKER, B.S., Lecturer in Engineering Design.
 FRANCIS R. BERRY, M.S., Lecturer in Engineering Design.
 GARLAND W. BROWN, M.S., Lecturer in Engineering Design.
 GEORGE E. DAVIS, A.M., Lecturer in Engineering Design.
 ALFRED E. EDSTROM, M.A., Lecturer in Engineering Design.
 JOSEPH FRISCH, B.S., Lecturer in Engineering Design.
 ALBERT L. HALE, B.S., Lecturer in Engineering Design.
 HENRY E. HARRIS, M.S., Lecturer in Engineering Design.
 CHARLES W. RADCLIFFE, B.S., Lecturer in Engineering Design.
 WILLIAM S. ROUVEROL, M.S., Lecturer in Engineering Design.
 JAY SCHEINMAN, B.Eng., Lecturer in Engineering Design.
 FRANKLIN H. THOMPSON, M.S., Lecturer in Engineering Design.
 NORMAN S. WANER, M.S., Lecturer in Engineering Design.

IRRIGATION

BERNARD A. ETCHEVERRY, B.S., Professor of Irrigation and Drainage (Chairman of the Division).
 SIDNEY T. HARDING, B.S., Professor of Irrigation, Emeritus.
 FREDERICK L. HOTES, M.S., Assistant Professor of Irrigation.

MECHANICAL ENGINEERING

RICHARD G. FOLSOM, Ph.D., Professor of Mechanical Engineering (Chairman of the Division).
 FRANCIS W. HUTCHINSON, M.S., M.E., Professor of Mechanical Engineering.
 HENRY A. SCHADE, Dr. Ing., Professor of Mechanical Engineering.
 LEONID MICHAEL TICHVINSKY, D.E.M., Professor of Mechanical Engineering.
 CARL J. VOGT, M.S., Professor of Mechanical Engineering.
 BALDWIN M. WOODS, Ph.D., Professor of Mechanical Engineering.
 JOSEPH N. LECONTE, M.M.E., Professor of Mechanical Engineering, Emeritus.
 BENEDICT F. RABER, B.S., Professor of Mechanical Engineering, Emeritus.
 FLOYD H. CHERRY, B.S., Associate Professor of Mechanical Engineering, Emeritus.
 HERBERT B. LANGILLE, A.B., Associate Professor of Mechanical Engineering, Emeritus.
 ALEXANDER BOODBERG, M.S., M.E., Associate Professor of Mechanical Engineering.
 E. PAUL DEGARMO, M.S., Associate Professor of Mechanical Engineering.
 HANS ALBERT EINSTEIN, D.S.T., Associate Professor of Mechanical Engineering.
 HAROLD A. JOHNSON, M.S., Associate Professor of Mechanical Engineering.
 JOE W. JOHNSON, M.S., Associate Professor of Mechanical Engineering.
 EDWARD KEACHIE, Ph.D., Associate Professor of Mechanical Engineering.

EDMUND V. LAITONE, M.A., Associate Professor of Mechanical Engineering.
 JOHN F. MCGARRY, M.S., Associate Professor of Mechanical Engineering.
 ERICH G. THOMSEN, Ph.D., Associate Professor of Mechanical Engineering.
 ISRAEL I. CORNET, Ph.D., Assistant Professor of Mechanical Engineering.
 ROBERT A. CORNOG, Ph.D., Assistant Professor of Mechanical Engineering.
 LOUIS E. DAVIS, M.S., Assistant Professor of Mechanical Engineering.
 ROBERT V. DUNKLE, M.S., Assistant Professor of Mechanical Engineering.
 ROSTISLAV A. GALUZEVSKI, M.S., Assistant Professor of Mechanical Engineering.
 RAYMOND C. GRASSI, M.S., Assistant Professor of Mechanical Engineering.
 LAWRENCE M. GROSSMAN, Ph.D., Assistant Professor of Mechanical Engineering.
 HAROLD W. IVERSEN, M.S., Assistant Professor of Mechanical Engineering.
 JAMES T. LAPSLEY, M.S., Assistant Professor of Mechanical Engineering.
 DONALD G. MALCOLM, M.S., Assistant Professor of Mechanical Engineering.
 PRENTISS C. NELSON, M.S., Assistant Professor of Mechanical Engineering.
 FRED M. SAUER, M.S., Assistant Professor of Mechanical Engineering.
 SAMUEL A. SCHAFF, Ph.D., Assistant Professor of Mechanical Engineering.
 NATHAN W. SNYDER, Ph.D., Assistant Professor of Mechanical Engineering.
 RUSSELL F. RHYNE, M.S., Instructor in Mechanical Engineering.



MARTIN B. BILES, M.S., Lecturer in Mechanical Engineering.
 ROBERT M. DRAKE, JR., M.S., Lecturer in Mechanical Engineering.
 LEO K. EDUARDE, B.S., Lecturer in Mechanical Engineering.
 LEONARD FARBAR, M.S., Lecturer in Mechanical Engineering.
 WARREN H. GIEDT, M.S., Lecturer in Mechanical Engineering.
 CARROLL I. HENWOOD, B.S., Lecturer in Mechanical Engineering.
 DANIEL O. KLUTE, B.S., Lecturer in Mechanical Engineering.
 ALAN D. K. LAIRD, M.S., Lecturer in Mechanical Engineering.
 CHARLES A. LAMB, M.S., Lecturer in Mechanical Engineering.
 ARTHUR S. LEONARD, M.S., Lecturer in Mechanical Engineering.
 FRANK L. MAKER, M.E., Lecturer in Mechanical Engineering.
 WILLIAM E. NERO, B.S., Lecturer in Mechanical Engineering.
 KENNETH F. PAULOVICH, M.S., Lecturer in Mechanical Engineering.
 ROLAND W. PINGER, M.E., Lecturer in Mechanical Engineering.
 ROBERT W. ROTH, B.S., Lecturer in Mechanical Engineering.
 VIRGIL E. SCHROCK, M.S., Lecturer in Mechanical Engineering.
 RALPH A. SEBAN, Ph.D., Lecturer in Mechanical Engineering.
 JOHN B. TURNER, JR., M.S., Lecturer in Mechanical Engineering.
 CHIN-TSE YANG, M.S., Lecturer in Mechanical Engineering.

MINERAL TECHNOLOGY

ANDERS J. CARLSON, C.E., Ph.D., Professor of Petroleum Engineering (Chairman of the Division).
 JOHN E. DORN, Ph.D., Professor of Metallurgy.
 RALPH R. HULTGREN, Ph.D., Professor of Metallurgy.
 *LESTER C. UREN, B.S., Professor of Petroleum Engineering.
 EDWARD H. WISSER, B.S., Professor of Mineral Exploration.
 ERNEST A. HERSAM, B.S., Professor of Metallurgy, Emeritus.
 EARL R. PARKER, Met.E., Associate Professor of Metallurgy.
 JOSEPH A. PASK, Ph.D., Associate Professor of Ceramic Engineering.

* Absent on leave, 1949-1950.

JOHN A. PUTNAM, Ph.D., Associate Professor of Petroleum Engineering.
 DAVID W. MITCHELL, Ph.D., Assistant Professor of Metallurgy.
 WILBUR H. SOMERTON, Pet.E., Assistant Professor of Petroleum Engineering.
 BERNARD YORK, E.M., Assistant Professor of Mining.



DURAND A. HALL, M.A., Lecturer in Mining.
 FRANK G. MILLER, M.S., Lecturer in Petroleum Engineering.

TRANSPORTATION AND TRAFFIC ENGINEERING

DONALD S. BERRY, Ph.D., Visiting Professor of Transportation Engineering.
 HARMER E. DAVIS, M.S., Professor of Civil Engineering, Director of the Institute of Transportation and Traffic Engineering.
 RALPH A. MOYER, C.E., Professor of Civil Engineering.
 DAN M. FINCH, B.S., Associate Professor of Electrical Engineering.
 BERNARD A. VALLERGA, M.S., Assistant Professor of Civil Engineering.
 FOREST H. GREEN, M.S.C.E., Visiting Associate Professor of Transportation Engineering.



ANDREW CHARWAT, M.E., Lecturer in Mechanical Engineering.
 FRED N. FINN, B.S., Lecturer in Transportation Engineering.
 WILLIAM A. GROSS, M.S., Lecturer in Mechanical Engineering.
 CECIL J. VAN TIL, M.S.C.E., Lecturer in Transportation Engineering.

Inspection trips may be a part of the academic program of any course given by the Divisions of the Department of Engineering.

Lower division courses in the Department of Engineering which are of general interest to students in various curricula are listed under Engineering.

ENGINEERING

1A-1B. Plane Surveying. (3-3) Yr. Beginning each semester.

The Staff (Mr. Foote in charge)

Prerequisite: plane trigonometry and one high school unit in mechanical drawing.

Principles; field practice; calculations and mapping.

1AX-1BX. Supplementary Course in Plane Surveying: Field Work. (1-1) Yr. Beginning each semester.

Open only to students entering the colleges at Berkeley with 2 units' credit for recitations and lectures in course 1A-1B.

8. Materials of Engineering Construction. (2) I and II.

The Staff (Mr. Kelly in charge)

Prerequisite: sophomore standing in civil engineering.

Structural properties and adaptability of various materials.

18A-18B. Strength of Materials. (3-3) Yr.

The Staff (Mr. Kelly in charge)

For students in architecture. Prerequisite: Mathematics 4A, Physics 2A and 3A or 4A. 18B is offered in the fall semester; 18A, in the spring semester.

Elementary analytic mechanics; application of statics and theory of elasticity to elements of structural design.

21. Plane Surveying. (3) II.

Mr. Olitt

Lectures and field work.

Prerequisite: plane trigonometry and one high school unit in mechanical drawing. Prescribed for students in architecture and landscape design; not open to students in engineering.

Principles; field practice; calculations and mapping.

22. Engineering Drawing. (2) I and II. The Staff (Mr. Levens in charge)
Lectures and laboratory.
Prerequisite: plane geometry, trigonometry, and mechanical drawing.
Geometric constructions; freehand pictorials; theory of orthogonal projection; simple auxiliaries; sectioning, fasteners; dimensioning; simple working drawings.
23. Descriptive Geometry. (2) I and II. The Staff (Mr. Levens in charge)
One lecture and five laboratory hours per week.
Prerequisite: course 22 and Mathematics 3A or 3 (may be taken concurrently).
The fundamental principles of descriptive geometry and their applications to the solution of three-dimensional problems arising in the various branches of engineering.
24. Advanced Engineering Drawing. (2) I and II. The Staff (Mr. Levens in charge)
One lecture and five laboratory hours per week.
Prerequisite: course 23.
Cams and gears; working drawings of machine parts; freehand sketching; structural detailing; piping layouts; and introduction to graphic integration and differentiation.
35. Statics. (3) I and II. The Staff (Mr. Meriam in charge)
Three lectures per week.
Prerequisite: Physics 4A, Mathematics 4A and 4B (Mathematics 4B may be taken concurrently).
Force systems and equilibrium conditions as applied to engineering problems. Includes graphical methods and the use of diagrams as an aid to algebraic solutions.
40. Elementary Metallurgy. (3) I and II. Mr. Potter
Two lectures and one lecture demonstration period per week.
Prerequisite: Chemistry 1A, Physics 4A and 4B or 4C (may be taken concurrently).
An elementary course for mechanical engineers describing the relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys. Heat treatment of steel and nonferrous metals, production of steel, aluminum, and magnesium. Description of many engineering alloys.
Not open to metallurgy majors. Students specializing in metallurgy should take Chemistry 1B and Metallurgy 150A.
- 40K. Elementary Metallurgy. (2) I and II. Mr. Potter
Prerequisite: same as for course 40.
- 40L. Elementary Metallurgy Laboratory. (1) I and II. Mr. Potter
Prerequisite: course 40K, which may not be taken concurrently.
The laboratory part of course 40.
41. Manufacturing Processes. (4) II. The Staff (Mr. DeGarmo in charge)
Two lectures, one demonstration period, and one three-hour laboratory period per week.
Prerequisite: courses 23 and 40; Chemistry 1A; Physics 4A.
Nonmetals; casting processes; gauging; metal cutting; general purpose and production type machine tools; tooling; jigs and fixtures; hot and cold forming; grinding; protective and decorative surface treatments; gas and electric welding; relation of design to production.

42. Materials and Processes of Manufacturing. (4) I.

The Staff (Mr. Thomsen in charge)

Two lectures, one demonstration period, and one three-hour laboratory period each week.

Prerequisite: course 23, Chemistry 1A, Physics 4A. For students in electrical engineering and process engineering.

The nature and properties of materials commonly used in manufacturing and their relation to the manufacturing processes. Heat treatment of metals; casting; hot and cold forming; gauging; cutting of metals; shapers; lathes; drill presses, milling machines, grinders; resistance and fusion welding.

48. The Engineering Student and His Profession. (1) I and II.

Mr. Woods, Mr. Rouverol

Prerequisite: freshman standing in engineering.

History and development of the fields of engineering, the great engineers and their achievements, the engineering profession and modern trends.

113. The Engineer and His Professional Duties. (2) I and II.

The Staff (Mr. O'Brien in charge)

Prerequisite: senior standing in engineering.

Oral and written reports on various subjects pertinent to the professional relationships, duties, and ethics of the engineer.

120. Principles of Engineering Investment and Economy. (3) I and II.

Mr. DeGarmo, Mr. Keachie, Mr. Pinger

Prerequisite: senior standing in engineering.

Derivation of formulas used in the theory of investment; economy studies applied to original and alternative investments in engineering enterprise; replacement problems; relation of personnel and quality control factors to engineering economy; economy studies of governmental projects.

197. Summer Course in Hydroelectric Inspections. (4)

Mr. Dalziel

Prerequisite: senior or graduate standing in engineering; enrollment subject to approval of instructor.

Three-week inspection trip to selected hydroelectric projects in California. At the conclusion of the trip, the remainder of the Summer Session will be spent in the preparation of a written report. Inspections will include various types of dams, canals, conduits, penstocks, valves, hydraulic turbines, electric generators, transformers, switchgear, protective devices, and high-voltage transmission apparatus.

Courses characteristic of the various curricula offered by the College of Engineering are described under the several divisions of the department, as follows.

CIVIL ENGINEERING

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of the lower division requirements and completion of the junior status examination.

101. Engineering Photography, Photogrammetry, and Airphoto

Interpretation. (2) I.

Mr. Van Til

Prerequisite: Engineering 1A-1B.

Two lectures per week covering the principles of photography pertaining to engineering research; photogrammetry; the techniques used in the interpretation of aerial photographs relating to mapping, soil surveys, and drainage studies.

- 102A. Route Surveying. (3) I and II. The Staff (Mr. Foote in charge)
Lectures and field work.
Prerequisite: Engineering 1A-1B.
Simple, compound, and transition curves, reconnaissance, preliminary and location surveys; calculations of earthwork and other quantities; field work.
- 102B. Economics of Railroad Locations. (3) II. Mr. Foote
Prerequisite: course 102A.
Influence of location upon earning power, with particular reference to effect of changes in distance, grade, and curvature upon operating expenses; plotting of maps, profiles, and mass diagrams; drafting of railroad structures.
104. Railroad Engineering. (2) I. Mr. Foote
Prerequisite: course 102A-102B.
Grading, tunnels, signaling, track, yards, maintenance, line and grade changes.
105. Higher Surveying and Geodesy. (2) II. Mr. Foote
Prerequisite: Engineering 1A-1B.
Methods of geodetic surveying; adjustment of observations; geodetic positions; map projections.
106. Highway Engineering. (2) I and II. Mr. Moyer, Mr. Jones, Mr. F. H. Green
Prerequisite: Engineering 8 and junior standing in engineering.
Location, design, economics, drainage, construction, and maintenance of highways, streets, and pavements; drainage and pavements for airports.
- 107A. Framed Structures. (3) I and II. Mr. R. E. Davis, Mr. Bresler, Mr. Pirtz
Prerequisite: course 108A.
Computation of stresses in roofs, building frames, and simple bridge trusses, by algebraic and graphical methods.
- 107E. Reinforced Concrete Design. (3) I. Mr. Troxell
Prerequisite: Engineering 18A-18B.
For architectural students. Design of reinforced concrete buildings, including foundations and retaining walls.
- 107F. Framed Structures. (3) II. Mr. Troxell
Prerequisite: course 112.
For architectural students. Stress computations and design of structures in wood, steel, and reinforced concrete, particularly of buildings.
- 107G. Analysis of Airplane Structures. (3) I and II. Mr. Eberhart, Mr. Bresler
Prerequisite: course 107A or Engineering Design 106.
Solution of typical stress analysis problems; load requirements; thin web beams; monocoque construction; plate stringer combinations; beam columns; space frames.
- 108A. Strength of Materials. (3) I and II. The Staff (Mr. Popov in charge)
Prerequisite: Engineering 35.
Elastic and ultimate resistance of materials; stress analysis for bars, beams, columns, and shafts; deflections and combined stresses; elements of design for wood and steel structures.
- 108C. Civil Engineering Laboratory. (1) I and II. The Staff (Mr. Troxell in charge)
Prerequisite: Engineering 8 and courses 108A and 135 (may be taken concurrently).
Principles and methods of testing engineering materials. Physical tests of brick, concrete, iron, steel, and wood.

- 108E. Concrete Laboratory. (2) I. The Staff (Mr. Troxell in charge)
Prerequisite: Engineering 8 and course 108A (which may be taken concurrently).
Physical tests of cement, aggregates, and concrete; proportioning and properties of concrete mixtures.
- 108F. Civil Engineering Laboratory. (1) I and II. The Staff (Mr. Kelly in charge)
I. For students in electrical engineering, mineral technology, and architecture.
II. For students in mechanical engineering, metallurgy, and architecture.
Prerequisite (may be taken concurrently): for electrical and mechanical engineering and metallurgy, course 108A; for architecture, Engineering 18B.
Principles and methods of testing engineering materials. Physical tests of concrete, steel, iron, and wood.
- 108G. Asphalt Laboratory. (1) I and II. The Staff (Mr. H. E. Davis in charge)
Prerequisite: senior standing in civil engineering.
Physical and mechanical tests of asphalts and asphaltic mixtures.
- 108H. Soil Mechanics. (2) I and II. The Staff (Mr. H. E. Davis in charge)
Lecture and laboratory.
Prerequisite: senior standing in civil engineering.
Lectures on theoretical soil mechanics with selected experiments on physical and mechanical properties of soils for engineering uses.
- 109A. Sewerage Engineering. (2) I and II. Mr. Gotaas
Prerequisite: course 110.
Flow in sewers; fundamental considerations; design and construction of sewerage works.
- 109B. Design of Water Purification and Sewage Disposal Facilities. (2) II. Mr. Gotaas
Prerequisite: course 111B.
Engineering design of water purification and sewage treatment facilities; includes aeration, coagulation, sedimentation, decomposition, filtration, biology, oxidation and disinfecting processes.
110. Hydraulics. (3) II. Mr. J. W. Johnson
Prerequisite: junior standing, Engineering Design 102B (may be taken concurrently).
Theory; application of principles; water-measuring devices; stream gauging.
Mechanical Engineering 103 may be substituted for this course.
- 111A. Water Supply Engineering. (2) I and II. Mr. Gotaas
Prerequisite: course 110.
Water supply demands, yields of water sources; design and construction of water works.
- 111B. Chemistry and Biology of Water Purification and Sewage Treatment. (2) I. Mr. Langelier
Prerequisite: course 123.
The chemical and biological character of water and sewage; theory of water purification and sewage disposal processes.
112. Elements of Framed Structures. (2) II. Mr. Wiskocil, Mr. Lin
Prerequisite: Engineering 18A-18B.
For students in architecture.
Analytical and graphical stress analysis for framed structures.

113. Foundations. (2) I. The Staff (Mr. Jameyson in charge)
Prerequisite: courses 108A, 133, and 135.
Properties and classification of soils; bearing capacities and lateral pressures. Bridge and building foundations, footings, sheet-piling, piles, cofferdams, open, box, and pneumatic caissons; deep-well dredging.
116. Engineering Relations, Contracts, and Economics. (2) I and II. Mr. Wiskocil
Prerequisite: limited to students in civil engineering who will have completed all the requirements for the B.S. degree at the close of the semester in which the course is taken.
Professional duties and privileges; principles of business law; preparation of contracts and contract documents, including specifications and drawings.
120. Introduction to Civil Engineering Problems. (2) I. Mr. Woodward, Mr. Pirtz
One lecture and one drafting period per week.
Prerequisite: Engineering 22 and 23.
A series of problems illustrating practices in civil engineering design and construction, including terminology detailing, preparation of cost estimates and methods of computation.
123. Sanitary Engineering Laboratory. (4) I and II. Mr. Langelier
Prerequisite: Chemistry 1A-1B.
Chemical and bacteriological examination of water and sewage, with particular reference to analytical control of water purification and sewage treatment processes.
124. Principles of Public Health Engineering. (3) II. Mr. Langelier
Prerequisite: junior standing. Open to upper division students in engineering and science.
A general course in the engineering approach to problems of municipal sanitation and public health.
125. Experimental Sanitation. (2) I. Mr. Langelier
Prerequisite: Chemistry 1A-1B.
An introduction to the principles of sanitary science. Controls against the contamination of water, air, and food, and insect control.
126. Applied Sanitary Science and Municipal and State Sanitation. (2) II. Mr. Gotaas
Prerequisite: courses 123 and 111B.
133. Elementary Structural Design. (3) I and II. Mr. Popov
Prerequisite: course 108A.
Design of steel and timber structural components; structural connections, tension and compression members, and beams.
135. Reinforced Concrete. (2) I and II. Mr. R. E. Davis, Mr. Troxell, Mr. Lin
Prerequisite: course 108A.
Elementary analysis and design of reinforced concrete beams, slabs, columns, and footings.
136. Structural Analysis and Design of Bridges. (3) I and II. The Staff (Mr. Jameyson in charge)
(Formerly numbered 107D.)
Prerequisite: courses 107A, 108A, 133, and 135.
Analysis and design of girder, truss, rigid frame, and continuous bridges with special emphasis on highway bridges. Introduction to Moment Distribution and its application to analysis of bridges.
137. Structural Analysis and Design of Buildings. (3) I and II. The Staff (Mr. Eberhart in charge)
(Formerly numbered 107C.)
Prerequisite: courses 107A, 133, and 135.
Analysis and design of building structures under the action of vertical dead and live loads, and of wind and earthquake forces. Building code and

structural requirements in connection with the use of timber, steel frame, reinforced concrete, and brick.

147. Sanitary Engineering Chemistry. (3) II. Mr. Tebbens
Prerequisite: course 123 or equivalent.
Lectures, demonstrations, and problems concerning the applications of organic chemistry and biological chemistry to water purification, sewage treatment, agricultural and industrial wastes, and sanitation of the industrial environment.
151. Hydrology. (2) I. Mr. Hotes
Prerequisite: course 110 or Mechanical Engineering 103.
Principles involved in determining water supplies and flood flows; application of statistics to hydrologic observations; unit hydrograph, ground water, runoff, storage and flood control problems.
161. Hydraulic Laboratory. (2) I and II.
The Staff (Mr. Einstein and Mr. J. W. Johnson in charge)
Prerequisite: course 110 or Mechanical Engineering 103.
Intended primarily for students in civil engineering, electrical engineering, irrigation, and mining.
An introductory laboratory course which includes experiments on weirs, pipes and channels, spillways, hydraulic jump, model laws, turbines, pumps, and other hydraulic phenomena. Program largely optional.
171. Introduction to Traffic Engineering. (3) II. Mr. Berry
Prerequisite: senior standing in engineering.
Street and highway traffic problems; principles of design of thoroughfares on the basis of operational characteristics; traffic regulation and control.
175. Airphoto Analysis and Interpretation. (3) I. Mr. Van Til
Prerequisite: senior standing in engineering or geology.
Three lecture and recitation hours per week covering the principles of aerial photography and photogrammetry; the use of airphotos in identifying land forms, in locating transportation facilities, and in the interpretation of soil and drainage conditions for highway and airport site selection.
190. Engineering Reports. (2) I and II. Mr. Kelly
Prerequisite: junior standing in civil engineering.
Application of written and oral expression to the preparation of technical reports and articles.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Troxell in charge)
Prerequisite: senior standing in engineering.
Group study of a selected topic or topics in civil engineering.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. R. E. Davis in charge)
Prerequisite: senior standing in engineering.
Individual study and/or investigation of a subject in civil engineering in which the student has a special interest.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

208. Advanced Soil Mechanics. (3) II. Mr. H. E. Davis, Mr. Krynine
Prerequisite: courses 108H, 110, and 113.
Lectures, reading assignments, laboratory problems, and reports on advanced topics in soil mechanics.

220. Advanced Structural Analysis and Design. (3) I. Mr. Olitt
Prerequisite: courses 136 and 137.
Lectures and computations in the analysis of statically indeterminate structures by moment distribution, column analogy, and other methods; design of building frames for wind and earthquake loadings.
221. Experimental Structural and Stress Analysis. (3) II. Mr. Eberhart
Prerequisite: courses 136 and 137.
Lectures and laboratory in the principal experimental methods used for structural and stress analysis, including similitude and loaded models, elastic line models, mechanical and electrical strain gauging, stress coat analysis, analogy methods, and photoelasticity.
- †222A–222B. Sanitary Design. (3–3) Yr. Mr. Gotaas
Prerequisite: courses 109A, 110, 111A, 111B.
Design of elements of systems for water supply, water purification, sewerage, sewage and refuse treatment and disposal, etc.
224. Design of Thin-Sheet Structures. (3) II. Mr. Bresler
Prerequisite: graduate standing. Seniors majoring in structural engineering may be admitted to the course with consent of the instructor.
Design specifications, materials of construction, fabrication methods, stress analysis, and design of thin-sheet structures.
225. Advanced Sanitary Engineering Laboratory. (3) II. Mr. Langelier
Prerequisite: course 123. Program to be arranged in each case.
Special laboratory problems in analysis of milk, water, sewage, air, and refuse; tests of plant models and commercial apparatus.
- 230A–230B. Advanced Mechanics of Materials. (3–2) Yr. Mr. Popov
Prerequisite: graduate standing. Course 230A is not prerequisite to 230B.
Failure theories; inelastic bending; limit design; thick-walled cylinders; torsion of noncircular elements; design for fluctuating and sustained loads; application of theory of elasticity to some complex states of stress; curved bars; elastic stability; plates; beams on elastic foundations.
235. Analysis and Design of Masonry Dams. (3) II. Mr. Hotes
Prerequisite: courses 113, 136, and 137.
Lecture and design course. Selection of location and type; stability analysis, stress analysis of gravity, arch, multiple-arch, dome, and slab-butress dams; problems imposed by construction conditions and use of mass concrete.
236. Advanced Bridge Design. (3) I. Mr. Lin
Prerequisite: courses 136, 137.
Design and analysis of advanced bridge structures; bridge approaches; bridge substructures; bridge layouts; bridge economics; bridge specifications; special design problems.
241. Industrial and Agricultural Waste Treatment. (2) II. Mr. Gotaas
Prerequisite: courses 109B and 123.
Studies of the wastes from industrial and agricultural processes that may be detrimental to watercourses, water supplies, sewerage systems, or the atmosphere; principles and methods of disposal and treatment of important wastes and municipal refuse.
242. Atmospheric Pollution. (3) I. Mr. Tebbens
Prerequisite: course 123 or equivalent.
Study of air pollution by gases, fumes, vapors and dusts; nature of polluting materials, and relation of atmospheric conditions to their dispersal; methods of air analysis, standards of and control of pollution and administrative problems.

† To be given if a sufficient number of students enroll.

261. Advanced Hydraulic Structures Laboratory. (2) II. Mr. J. W. Johnson
Prerequisite: courses 161 and 275.
Advanced problems including experimental investigations of hydraulic model laws; experimental hydraulic structure, river and harbor models; studies of flood waves, oscillatory waves, beach erosion and protection, sediment transportation, energy dissipation.
275. River-Harbor Hydraulics. (3) I. Mr. J. W. Johnson
Prerequisite: course 110, and graduate standing.
The theory underlying the design of hydraulic structures, with particular reference to variable flow, channel waves, tides, transportation of detritus by stream, beach erosion, and the use of hydraulic models.
280. Concrete Construction Practice. (2) I. Mr. R. E. Davis
Prerequisite: courses 108E, 135, and graduate standing.
Lectures and seminars. Consideration of broad aspects of concrete construction; technical requirements; selection of materials; control of quality; practices in the construction of dams, highways, airfields, canals, bridges, buildings, hydraulic structures.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
Prerequisite: graduate standing. The Staff (Mr. Eberhart in charge)
Studies and investigations in selected advanced civil engineering subjects.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. The Staff (Mr. Eberhart in charge)
Prerequisite: graduate standing.
Investigation of selected advanced civil engineering subjects.

ELECTRICAL ENGINEERING

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

- 100A-100B. Electrical Circuits and Machinery. (3-3) Yr.
Mr. Robertson, Mr. Teale, Mr. Black, Mr. Hinrichs
Prerequisite: Mathematics 14A or 4A-4B; Physics 1C or 4B.
Required for students in agricultural, industrial, and mechanical engineering.
- 100A. Voltage generation; circuit constants; single-phase and poly-phase circuit analysis; single-phase transformers; polyphase connections of transformers.
- 100B. Machine windings and induced voltages; synchronous, induction, direct current, and single-phase machines; rectification; electronic tubes and their associated circuits; practical engineering problems.
101. Electrical Engineering. (3) I and II. Mr. Norris, Mr. Brede
Open to engineering students not registered in agricultural, electrical, industrial, or mechanical engineering.
Prerequisite: Mathematics 4A, Physics 1C or Physics 4B.
Electric power generation, transmission, distribution, and utilization.
102. Electrical Engineering Laboratory. (1) I and II. Mr. Teale
One three-hour period per week to be arranged. Sections limited to fifteen students.
Prerequisite: course 101, which should be taken concurrently if possible.
Experiments designed to illustrate electrical theory and afford practice in the operation of electrical equipment. Designed to accompany and supplement course 101.

103A-103B. Engineering Design of Particle Accelerators. (2-2) Yr.

Mr. Marshall

Prerequisite: junior or senior standing in engineering.

Design factors, and applications of modern nuclear machines such as cascade transformers, impulse generators, Van De Graaf generators, beta-trons, cyclotrons (synchro-cyclotron), and linear accelerators.

104A-104B. Electrical Laboratory. (1-1) Yr. Mr. Robertson, Mr. Teale

Three hours weekly.

Prerequisite: course 100A-100B or 110A-110B (may be taken concurrently).

Introductory experiments illustrating principles of design and operation of alternating- and direct-current motors and generators, transformers, vacuum tubes, single and polyphase circuits, metering and control equipment.

105. Electrical Measurements in Engineering. (3) I.

The Staff (Mr. Pritchett in charge)

Two lectures and one three-hour laboratory period per week.

Prerequisite (may be taken concurrently): course 100A, or 101 and 102, or 110A; Mathematics 110.

Electrical measurements using direct current and low-frequency alternating current. Principles and characteristics of indicating and recording instruments, including oscillographs; potentiometer, bridge, and comparison methods; applications of these in the measurement of temperature, pressure, strain, etc., in various fields of engineering.

106. Basic Electronics. (4) II. The Staff (Mr. Morton in charge)

Three lectures and one three-hour laboratory period per week.

Prerequisite: course 100A, or 101, or 110A; Mathematics 110. Recommended: course 105.

Electron emission; motion of charges in electromagnetic fields; electrical conduction in vacuum and through gases; electron tubes, high-vacuum and gas-filled; elementary applications of electronic devices in rectifiers and amplifiers.

110A-110B. Electrical Circuits and Machinery. (3-3) Yr.

The Staff (Mr. McFarland in charge)

Prerequisite: Mathematics 14A or 4A-4B; Physics 1C or 4B.

Required for students in electrical engineering.

110A. Alternating-current circuits.

110B. Single-phase transformers, polyphase transformations, polyphase induction motors.

111A-111B. Advanced Electrical Machinery. (3-3) Yr.

The Staff (Mr. McFarland in charge)

Prerequisite: courses 104A-104B, 106 (for 111A only), 110A-110B; Engineering 35, Engineering Design 102B. Course 111A is not prerequisite to 111B.

Construction, theory of operation, and performance characteristics of synchronous and direct-current machines.

116A-116B. Engineering Electronics and Radio Engineering. (3-3) Yr.

Mr. Reukema, Mr. Scott, Mr. Abbott

Prerequisite: course 106, Mathematics 110, and senior standing in electrical or mechanical engineering.

Design and operating characteristics of radio transmitters and receivers for amplitude modulation, frequency modulation, television and radar; propagation of electromagnetic waves and the design of antennas and antenna arrays.

117A-117B. Electromagnetic Fields and Waves. (3-3) Yr.

Mr. Whinnery, Mr. Silver

Prerequisite: course 106 and Mathematics 110, or equivalent.

The mathematics of vector fields, static electric and magnetic fields. Maxwell's equations. Applications to problems in wave propagation, skin effect, wave guides and cavity resonators, electromagnetic radiation, and ultra-high-frequency technique.

118A-118B. Power System Protection. (2-2) Yr.

Mr. Dalziel

Prerequisite: course 111A (may be taken concurrently).

Symmetrical components, analysis of short circuits, decrement curves, power system protection, fundamentals of instrumentation, including instrument transformers, instruments and metering errors.

122A-122B. Electric Power Transmission and Distribution. (3-3) Yr.

Mr. Graybeal, Mr. Freeman

Prerequisite: course 110A-110B, Mathematics 110.

Fundamental theory of transmission and distribution systems. Calculation of inductance, a-c resistance, capacitance. Calculation and control of steady-state operating characteristics. Stability considerations. Traveling waves and surges. Mechanical design of long spans. Corona and its effect on transmission systems.

123A-123B. Telephone Engineering. (3-3) Yr.

Mr. Reukema

Prerequisite: course 106 and senior standing in electrical or mechanical engineering.

Course 123A is not prerequisite to 123B.

Telephone, telegraph, radio, and television transmission over open-wire, cable, and coaxial lines; design of transmitters and receivers, electrical filters, equalizers, phase distortion correctors, delay circuits, impedance matching circuits, and other electrical networks, and their coordination in communication circuits.

126. Industrial Electronics. (4) I.

The Staff (Mr. Bruns in charge)

Prerequisite: course 106.

A study of basic principles of electronic devices and circuits commonly found in industrial applications, with particular emphasis on grid-controlled rectifiers, electronic heaters, ignitron control of electric welding, and important methods of testing, measurement, and control.

127. Automatic Regulators. (4) II.

The Staff (Mr. Graybeal in charge)

Three lectures and one three-hour laboratory period per week.

Prerequisite: courses 110A-110B or 100A-100B, and 104A-104B.

Basic principles of regulators; function and characteristics of component parts; steady-state and transient theory; criteria for and methods of obtaining stability; applications to voltage, current, speed, and torque regulators; positioning controls; servomechanisms.

132A. Electrical Communications Laboratory. (2) I and II.

The Staff (Mr. Scott in charge)

Prerequisite: courses 104A-104B, 110A-110B completed; and 116A, which may be taken concurrently.

Experiments illustrating the fundamental principles involved in the operation of communication circuits and electronic devices. Particular consideration is given to the special methods of measurement, and special techniques, which must be employed at high frequencies.

132B. Electrical Communications Laboratory. (2) II.

The Staff (Mr. Black in charge)

Prerequisite: courses 116A, 132A and 117A or 123A completed; 116B and 117B or 123B, taken concurrently.

Selected experiments illustrating the fundamentals of electronics and

the generation, propagation, and radiation of electro-magnetic energy. Particular consideration is given to the ultra-high-frequency and micro-wave regions.

133. Electrical Machinery Laboratory. (2) I and II.

The Staff (Mr. Saunders in charge)

Prerequisite: courses 104A-104B, 110A-110B completed; and 111A, which may be taken concurrently.

Selected experiments on direct- and alternating-current machinery, designed to illustrate fundamental principles, applications, and recent developments in electric power machinery.

135. Control of Electric Motors. (3) I. The Staff (Mr. Graybeal in charge)

Two lectures and one three-hour laboratory period per week.

Prerequisite: courses 110A-110B or 100A-100B, and 104A-104B.

Design, construction, and operation of motor control equipment, electro-magnets and relays; mechanism of arc extinction in breakers; wiring diagrams; electronic control devices; controllers for reversing and adjustable-speed motors, and other electrical machinery.

140. Illumination Engineering. (3) I.

Mr. Finch

Two lectures and one three-hour laboratory period per week.

Prerequisite: senior standing in electrical engineering or special permission of the instructor.

Photometric concepts; engineering aspects of light; measurements, instruments, and techniques for lighting studies; light and vision; color specifications; design of lighting installations. Laboratory experiments and demonstrations.

141. Illumination and Radiation. (3) II.

Mr. Finch

Two lectures and one three-hour laboratory period per week.

Prerequisite: senior standing in electrical engineering or special permission of the instructor.

Thermal radiation, luminescence, ultraviolet radiation and infrared radiation, solar heating calculations, and design problems. Surface sources, interreflections. Germicidal, erythematous, and fading properties of ultraviolet radiations. Special problems in infrared transmitters, receivers, and applications. Design of typical installations.

198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. McFarland in charge)

Prerequisite: senior standing in engineering.

Group study of selected topics. Study groups may be organized in advanced electrical engineering subjects.

199. Individual Study and Research for Advanced Undergraduates. (1-5)

I and II.

The Staff (Mr. McFarland in charge)

Prerequisite: senior standing in engineering.

Individual study and/or research on a problem chosen from a restricted list. Enrollment is subject to the scholarship requirements imposed by the instructor concerned.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

200A-200B. Research Literature. (2-1) Yr.

The Staff (Mr. Morton in charge)

200A will be offered in both the fall and spring semesters; 200B will be offered in the spring semester only.

Prerequisite: graduate standing. This course must precede or accompany graduate research in electrical engineering.

Individual study of the historical background and present status of

research in the field of special interest to each student, culminating in written and oral reports presented to the staff and students of electrical engineering.

206. Theory of High Frequency Tubes. (3) I. Mr. Whinnery
Prerequisite: courses 116A-116B, 117A-117B, and graduate standing.
A study of the interchange of energy between electromagnetic fields and various electron streams operating under transit time conditions, with applications to the theory of space-charge controlled tubes, velocity modulation tubes, magnetrons, and traveling wave tubes.
- 216A-216B. Microwave Antennas. (3-3) Yr. Mr. Silver
Prerequisite: courses 116A-116B, 117A-117B, Mathematics 119A-119B.
Fundamental principles underlying the design of microwave antennas; radiation from current distributions; propagation, scattering, and diffraction of electromagnetic waves. Applications to the design of microwave arrays, pencil-beam, and shaped-beam antennas.
217. Microwave Networks. (3) II. Mr. Whinnery
Prerequisite: courses 117A-117B, 123A-123B, and graduate standing.
A study of the application of network theory, including the general theorems, the methods of analysis, and the measurement techniques, to microwave guides, cavity resonators, and antennas.
- 218A-218B. Power System Stability. (2-2) Yr. Mr. Dalziel
(Formerly numbered 218.)
Prerequisite: for 218A, course 118A (may be taken concurrently); for 218B, courses 118A, 218A, and 118B (may be taken concurrently); 111A.
Recommended: 111B.
Reduction of power networks, steady-state and transient stability limits of power systems.
- 220A-220B. Electro-Acoustics. (2-2) Yr. Mr. Black
Prerequisite: courses 110A-110B, 104A-104B, 116A-116B, 123A-123B, and Mathematics 110.
Principles and apparatus involved in the production, propagation, measurement, and reception of sound.
221. Transient Phenomena. (2) I. Mr. Robertson
Prerequisite: graduate standing in engineering, mathematics, or physics. Seniors with superior records may enroll with the instructor's permission.
Physical and mathematical analysis of transient phenomena, primarily in electrical circuits; single, mesh, and coupled circuits; circuit response to varying voltage; general rules and theorems on circuits; equivalent systems; practical applications.
222. Operational Circuit Analysis. (2) II. Mr. Abbott
Prerequisite: course 221 or graduate standing in engineering and the consent of the instructor.
Application of operational methods of circuit analysis, in particular the LaPlace Transformation, to systems having lumped or distributed constants.
223. Network Analysis. (2) I. Mr. Abbott
Prerequisite: course 123B or 127, and graduate standing.
Analysis of linear circuits, both bilateral and unilateral; applications of matrix algebra to unilateral circuits, feedback amplifiers; Routh's and Nyquist's criteria for stability.

226A-226B. Advanced Industrial Electronics. (3-3) Yr.

Mr. Bruns, Mr. Smith

Prerequisite: graduate standing in electrical engineering; course 126 recommended.

Electronic instrumentation and control, heating, metallurgical testing, medical applications, geophysical apparatus, electrolytic processes and calculators.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.

The Staff (Mr. McFarland in charge)

Prerequisite: graduate standing.

Advanced group study in various fields of electrical engineering. Topics vary from year to year. In the past, seminars have been arranged on non-linear conductors; power-system short circuits and stability; electromagnetic radiation; network analysis; theory of high-frequency tubes; and other subjects.

A seminar on electrical properties of matter has been scheduled for the spring semester.

299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.

The Staff (Mr. McFarland in charge)

Prerequisite: graduate standing.

Investigation of advanced electrical engineering problems.

ENGINEERING DESIGN**UPPER DIVISION COURSES**

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

102B. Dynamics. (3) I and II.

The Staff (Mr. Meriam in charge)

Three lectures per week.

Prerequisite: Mathematics 4A-4B; Physics 4A, Engineering 35.

Dynamics of a particle and of rigid bodies with emphasis on engineering applications. Force, momentum, and energy methods of solution.

102C. Advanced Mechanics. (3) II.

Mr. Meriam

Three lectures per week.

Prerequisite: course 102B, Mathematics 110A-110B, and senior standing in engineering. Enrollment limited to students who received a grade of A or B in the course 102B.

Advanced methods applied to dynamics problems. Fundamental laws of mechanics; vector analysis; energy methods in statics and dynamics; numerical and graphical integration; linear and nonlinear vibrating systems; gyroscopes and their applications.

106. Machine Design. (4) I and II. The Staff (Mr. C. W. Nelson in charge)

Two lectures and two three-hour laboratory periods per week.

Prerequisite: Engineering 24, course 102B, and Civil Engineering 108A.

Application of the principles of mechanics, physical properties of materials, and shop processes to the design of machine parts. Empirical and rational methods are employed.

111. Graphical and Mechanical Computations. (3) I and II. Mr. Levens

Two lectures and one three-hour laboratory period per week.

Prerequisite: senior standing in engineering, mathematics, or science.

Functional scales; theory and construction of nomographic charts for three or more variables; graphical integration and differentiation. Representation and analysis of experimental data.

170. Mechanics of Machinery. (3) I and II. Mr. Garland, Mr. C. W. Nelson
 Three lectures per week.
 Prerequisite: course 102B and Mathematics 110A–110B.
 Analysis of motions and forces in mechanisms. Introduction to the theory of mechanical vibrations with applications to dynamic balancing, critical speeds, governed systems, and vibration isolation.
171. Design of Mechanical Equipment. (3) I and II. Mr. Hirsch
 Lecture and laboratory.
 Prerequisite: course 106 or 106A and senior standing in engineering.
 Application of engineering principles to the design of complete machines, with emphasis upon economic aspects including selection of materials and manufacturing processes; balance between theoretical and experimental methods.
172. Stress Analysis of Machine Parts. (3) I and II. Mr. Soroka
 Lectures and laboratory.
 Prerequisite: course 106 or 106A, senior standing in engineering, and Mathematics 110A–110B.
 Experimental and theoretical methods for the determination of stresses and deflections in typical machine members. Factors affecting failure and the choice of working stresses. Laboratory experiments making use of brittle lacquers, various types of strain gauges, photoelastic and other methods.
198. Group Studies for Advanced Undergraduates. (1–5) I and II.
 The Staff (Mr. Garland in charge)
 Prerequisite: senior standing in engineering, plus particular courses to be specified by the instructor for each group.
 Studies in selected special subjects in the fields of engineering graphics, dynamics, elasticity, or design of mechanical equipment.
199. Individual Study or Research for Advanced Undergraduates. (1–5) I and II.
 The Staff (Mr. Garland in charge)
 Prerequisite: senior standing in engineering, plus particular courses and scholarship requirement to be specified in each instance by the instructor.
 Individual study or research on a special problem in graphics, dynamics, elasticity, or design of mechanical equipment. Enrollment is subject to the approval of an instructor and to the availability of laboratory facilities.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

280. Application of Analogs to Engineering Problems. (3) I. Mr. Soroka
 Three lectures per week.
 Prerequisite: graduate standing in engineering, physics, or mathematics.
 A study of the role of the electrolytic tank, electrical network, and differential analyzer in the solution of differential equations, linear and nonlinear. Applications to stress analysis, dynamics, servomechanics. Stress systems represented by hydrodynamics, membranes, slabs, and columns.
- 284A–284B. Advanced Dynamics of Machinery. (3–3) Yr. Mr. Garland
 Prerequisite: graduate standing. Recommended: course 170.
 Theory of mechanical vibrations with applications to linear and nonlinear systems having several degrees of freedom. Torsional and lateral vibrations of shafts. Energy methods and LaGrange's equations are employed.

- 285A. Basic Theory of Elasticity. (3) I. Mr. Meriam
 Three lectures per week.
 Prerequisite: differential equations, strength of materials.
 Fundamental concepts and methods of the mathematical theory of elasticity with application to engineering problems.
- 285B. Advanced Theory of Elasticity. (3) II. Mr. C. W. Nelson
 Three lectures per week.
 Prerequisite: course 285A.
 A continuation of course 285A including the study of torsion, curvilinear coördinates, three-dimensional problems, plates and shells, and other selected topics.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
 The Staff (Mr. Garland in charge)
 Prerequisite: graduate standing.
 Seminars in specialized subjects such as dynamics, elasticity, stress analysis, design of pressure vessels. Different subjects will be offered in successive semesters.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr.
 The Staff (Mr. Garland in charge)
 Prerequisite: graduate standing in engineering.
 Investigation of advanced problems in dynamics, elasticity, and design of mechanical equipment. Students enrolled will participate in a weekly research conference.

IRRIGATION

Courses 101, 102A, 102B, 103, 104, 107, and 112 are designed to meet the needs of engineering students. Courses 104, 106, 113 are designed for students in the College of Agriculture. Courses 103, 106, and 113 are also open to students in other colleges.

For other courses in irrigation see under Agriculture in earlier pages of this bulletin and in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

101. Irrigation Institutions and Economics. (2) II. ———
 Prerequisite: course 103 or 113.
 Water rights, irrigation institutions and organizations.
- 102A. Irrigation Engineering. (2) I and II. Mr. Etcheverry
 Prerequisite: Civil Engineering 110 or Mechanical Engineering 103.
 Investigation and general planning of irrigation systems; conveyance of water; silt problems; design of canals, tunnels, flumes, pipelines, inverted siphons.
- 102B. Irrigation Engineering. (2) I. Mr. Hotes
 Prerequisite: course 102A (may be taken concurrently).
 Principles of design of diversion weirs, headworks, wasteways, sand boxes, falls, checkgates, lateral headgates, road crossings, special types of distribution systems, measuring devices.
103. Agricultural Use of Water, and Irrigation Practice. (2) I and II.
 Prerequisite; junior standing. Mr. Etcheverry
 Sources of water supply; disposal of irrigation water applied to soil; water requirement of crops; duty of water, preparation of land and methods of irrigation; small pumping plants.

104. Drainage and Flood Protection. (2) II. Mr. Etcheverry
Prerequisite: junior standing and course 103 or 113.
Structure of soils and soil water and their relation to drainage; theory and principles of drainage; planning drainage systems; protection of lands against flood and tideswaters; organization of drainage and levee districts; methods of apportionment of assessments.
- *106. Irrigation Development and Organization. (2) II. _____
Prerequisite: Economics 1A-1B. For students in colleges other than Engineering.
Principles and administration of rights to use of water; organizations for and financing of irrigation developments.
During 1949-1950 students may take course 101 as a substitute for course 106.
- *107. Operation and Maintenance of Irrigation Systems. (2) I. _____
Prerequisite: course 113 for agricultural students; courses 102A and 103 for engineering students.
112. Irrigation Design. (2) I. Mr. Hotes
Prerequisite: Civil Engineering 108A, 135, and 110.
Design of structures such as flumes, drops, inverted siphons, and head-gates with estimates of cost.
- *113. Development and Use of Farm Irrigation Water Supplies. (3) I. _____
Prerequisite: Physics 1A-1B or 2A-2B or 4A-4B-4C; Chemistry 1A-1B.
Principles of irrigation relating to use of water in agriculture, including the subjects within the responsibilities of owners of irrigated land as distinguished from engineering features. Open to students in any program of study except civil engineering.
During 1949-1950 students may take course 103 as a substitute for course 113.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Etcheverry in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics. Study groups may be organized in irrigation, drainage, and flood protection.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Etcheverry in charge)
Prerequisite: senior standing in engineering.
Individual study and/or research on a problem normally chosen from a restricted list. Enrollment is subject to the scholarship requirements imposed by the instructor concerned.

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 163)
202. Advanced Irrigation Design. (2) I. Mr. Etcheverry
Prerequisite: course 112.
Design of diversion works, irrigation systems, special hydraulic structures.
298. Group Studies. Seminars or Group Research. (1-5) I and II.
The Staff (Mr. Etcheverry in charge)
Prerequisite: graduate standing.
Special studies and problems relating to drainage, reclamation, and flood protection; irrigation institutions and organizations; development and utilization of water supplies.

* Not to be given, 1949-1950.

299A–299B. Individual Study or Research. (1–5; 1–5) Yr. Beginning each semester.

The Staff (Mr. Etcheverry in charge)

Prerequisite: graduate standing.

Investigation of advanced irrigation, drainage, and flood protection problems.

MECHANICAL ENGINEERING

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

103. Elementary Fluid Mechanics. (3) I and II.

The Staff (Mr. Iversen in charge)

Prerequisite: Engineering Design 102B (may be taken concurrently) and junior standing.

The principles of mechanics applied to the statics and to the flow of incompressible and compressible fluids.

105A. Thermodynamics. (3) I and II. The Staff (Mr. Tichvinsky in charge)

Prerequisite: junior standing in engineering.

A special section is offered for students in the chemical engineering curriculum and process engineering program of study.

Energy transformations, reversibility, availability; thermal properties of gases and vapors. Theoretical cycles and practical engine forms, mechanisms and performance.

105B. Thermodynamics. (3) I and II. The Staff (Mr. Tichvinsky in charge)

Prerequisite: course 105A and junior standing in engineering.

Heat transmission and equipments, fuels, combustion, and analyses of products of combustion. Heat-power engines using nozzles. Reheat and regenerative cycles and equipments. Plant performance.

107. Mechanical Laboratory. (3) I and II.

The Staff (Mr. H. A. Johnson in charge)

I. For industrial engineering students.

II. For electrical and process engineering students.

Prerequisite: courses 105A and 105B (for II, course 105B may be taken concurrently).

Experimental work accompanied by calculations and reports on fluid flow, heat transfer, mechanics, combustion, internal combustion and other heat engines and power plant.

115. Reversed Thermodynamic Cycles and Refrigeration. (3) I.

Mr. Hutchinson

Prerequisite: courses 105A, 105B, and senior standing in engineering. Not open to students who have taken course 117.

Theory and practice of refrigeration, illustrated by study trips to actual plants.

116. Industrial Air Conditioning Methods Economics. (3) II.

Mr. Hutchinson

Prerequisite: courses 105A, 105B, and senior standing in engineering. Not open to students who have taken course 117.

Theory and practice of air conditioning, illustrated by study trips to actual plants.

117. Combined Refrigeration and General Air Conditioning. (3) I.

Mr. Thomsen

Prerequisite: courses 105A, 105B, and senior standing in engineering. Students taking this course may not subsequently take course 115 or 116.

Theory and practice of refrigeration and air conditioning, illustrated by trips to actual plants.

118. Industrial Power-Plant Design. (3) II. Mr. Tichvinsky
Prerequisite: courses 105A, 105B, and senior standing in engineering.
Theory and practice of industrial power-plant design and economics.
Illustrated by study trips to actual plants.
121. Engineering Aerodynamics. (3) II. Mr. Laitone
Prerequisite: course 103. Recommended: course 161 or 162.
Wing characteristics, performance determination, loading conditions,
static and dynamic stability and control of airplanes.
- 123A-123B. Internal Combustion Engines. (3-3) Yr.
Mr. Vogt (in charge), Mr. Tichvinsky, Mr. P. C. Nelson
Prerequisite: senior standing in engineering. Recommended: Mathe-
matics 110A-110B.
Application of the principles of engineering mechanics and thermo-
dynamics to the field of internal combustion engines.
123A. Injection systems, performance, fuels, carburetion.
123B. Dynamics, lubrication, heat transfer.
- 124A-124B. Mechanical Engineering. (3-3) Yr.
The Staff (Mr. Vogt in charge)
Prerequisite: courses 103, 105B, Electrical Engineering 100B, and
senior standing in engineering.
Summary of fundamentals of mechanical engineering; analysis of
typical engineering problems.
- *126. Applied Naval Architecture. (3) II. _____
Lecture and laboratory.
Prerequisite: course 128A.
Preparation of lines and curves of form for a ship of definite require-
ments, including dimensions, coefficients, displacement and stability under
various conditions of loading, power, and propeller requirements. Strength
computations and review of classification requirements.
- 128A. Marine Engineering (Hull). (3) I. Mr. Schade
Prerequisite: Engineering 35, Civil Engineering 108A (completed);
Engineering Design 102B and course 103 (may be taken concurrently).
Investigation of important hull problems arising in merchant-type
passenger and cargo vessel operation. Topics include: draft, trim, free-
board, capacity, stability intact, stability damaged, subdivision, rolling,
cargo handling, maneuvering. Emphasis on practical problems involving
existing ships.
- 128B. Marine Engineering (Machinery). (3) II. Mr. Tichvinsky
Prerequisite: courses 105A, 105B. Recommended: course 128A.
The power requirements and the selection of power plants for various
types of vessels and the necessary auxiliaries for steam and motor ships
will be considered.
- 131A-131B. Mechanical Engineering Laboratories. (4-4) Yr.
The Staff (Mr. Hutchinson in charge)
Prerequisite: senior standing in engineering. It is desirable that ex-
tended electives be completed before taking this course.
Engineering applications of the properties of substances, fluid mechan-
ics, heat transfer, and dynamics.
143. Time and Motion Study. (3) I and II.
Mr. L. E. Davis (in charge), Mr. Keachie, Mr. Malcolm
Prerequisite: senior standing in engineering, including completion of
Engineering 41 or 42, or in the School of Business Administration.
Laws of motion economy; study of hand motions and their simplifica-

tion through the use of process charts, micromotion analysis, and workplace design; theory and practice of time study, rating of worker performance, rate setting and wage payment.

144. Plant and Equipment Layout. (2) I and II.

Mr. Grassi, Mr. Malcolm, Mr. Lapsley

Prerequisite: course 143, and senior standing in engineering or in the School of Business Administration.

The general principles governing plant and equipment layout and their application. Consideration given to plant location, material flow, layout procedure and techniques, materials handling, plant illumination, plant services, buildings and maintenance.

145. Tool Engineering. (3) I and II.

Mr. Galuzevski in charge

Two lectures and one two-hour laboratory period a week.

Prerequisite: Engineering 24, 41, and senior standing in engineering.

A qualifying examination, in which a satisfactory grade must be achieved, will be given covering the subject material of prerequisite courses.

The selection of tooling for production; design of tools, jigs, fixtures, dies and production type gauges; design and tooling for automatic machines.

151. Industrial Heat Transfer. (3) I and II. Mr. H. A. Johnson, Mr. Seban

Prerequisite: courses 103, 105B. Strongly recommended: Mathematics 110A-110B (or equivalent).

The study of the basic principles of heat transfer and their application to the design of industrial equipment. Steady-state and transient problems of conduction by analytical and graphical methods. Free and forced convection. Transfer of radiant energy.

152A. Industrial Mass Transfer. (3) I.

Mr. McGarry, Mr. Snyder

Prerequisite: courses 105A and 105B. Recommended: Chemistry 109.

Principles of distillation, mechanical separations, filtration, crystallization, and materials handling.

152B. Industrial Mass Transfer. (3) II.

Mr. Snyder

Prerequisite: courses 105A, 105B, 151. Recommended: Chemistry 109. Course 152A is not prerequisite to 152B.

Thermodynamics, heat and mass transfer principles applied to process equipment involving evaporation, evaporative cooling, humidification, absorption and extraction, drying and adsorption.

154. Thermodynamics. (3) I and II.

Mr. Grossman, Mr. Dunkle

Prerequisite: course 105A.

Thermodynamic principles applied to process engineering. General conditions of equilibrium, reaction equilibria and the theory of solutions. The phase rule and phase equilibria of binary and multicomponent systems with application to mass transfer between phases. Thermodynamics of surface phenomena.

161. Applied Fluid Mechanics. (3) I and II.

Mr. Iversen

Prerequisite: course 103 or Civil Engineering 110.

The theory of viscous and turbulent flow with related phenomena; hydraulic machinery (including pumps, fans, compressors, turbines, and hydraulic couplings), similarity criteria and model laws.

162. Elementary Hydrodynamics. (3) I.

Mr. Putnam

Prerequisite: course 103 and Mathematics 110A-110B.

Stream function, potential function, and conformal transformation with applications to engineering problems. Theory and application of viscous and compressible flows.

163. Flow Problems of the Process Industries. (3) II. Mr. Farbar
Prerequisite: courses 103, 105A, and 105B.
Flow properties of mixtures and suspensions, plastic flow, multiphase flow, materials handling, mixing and pumping equipment.
164. Instrumentation and Automatic Control. (2) I. The Staff (Mr. Folsom in charge)
Prerequisite: courses 103, 105B, Engineering Design 102B. Recommended: Mathematics 110A–110B.
Descriptive and analytical study of instruments and fundamental mechanical control systems.
173. Acoustics of Machinery. (3) II. Mr. Snyder
Prerequisite: Engineering Design 102B and Mathematics 110A–110B. Recommended: Engineering Design 170.
The laws governing the generation, transmission, and reception of small amounts of energy through fluids and solids applied to machines and structures. Consideration given to the reduction of noise produced by machinery installations.
198. Directed Group Studies for Advanced Undergraduates. (1–5) I and II. The Staff (Mr. Folsom in charge)
Prerequisite: senior standing in engineering and at least a B average.
Group study of selected topics. Study groups may be organized in appropriate fields such as engineering statistics, industrial management, instrumentation, refrigeration, air conditioning, and design problems. Students may enroll in one or more separate subjects.
199. Individual Study and Research for Advanced Undergraduates. (1–5) I and II. The Staff (Mr. Schade in charge)
Prerequisite: senior standing in engineering and at least a B average.
Individual study and/or research on a problem normally chosen from a restricted list. Enrollment is subject to the scholarship requirements imposed by the instructor concerned.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)
Graduate standing is required for admission to these courses. In addition, graduate students must have completed at least Mathematics 110A–110B before undertaking any of the following courses, except as noted.

230. Engineering Analysis. (3) I. Mr. Schaaf
Prerequisite: graduate standing or Mathematics 110A–110B.
Methods of theoretical analysis of typical engineering systems. Practice in setting up and solving engineering problems in heat transfer, fluid mechanics, electrical network, mechanical vibrations, and elasticity.
243. Advanced Time and Motion Study. (3) I. Mr. L. E. Davis
Prerequisite: courses 143, 144, Economics 2, and Psychology 185 (may be taken concurrently). Mathematics 110A–110B not required.
A continuation on an advanced level of the subject matter presented in course 143; complex problems of production measurement and methods development; introduction to research techniques in development of fundamental data.
265. Heat Conduction. (2) I. Mr. Seban
This course covers the portion of former course 267A–267B which dealt with heat conduction.
Prerequisite: course 230. Recommended: course 151.
Study of the steady-state, transient, and periodic problems of heat conduction using both mathematical and numerical methods of solution. Introduction to problems of thermal stress.

266. Heat Convection. (3) II. Mr. Seban
 This course covers the portion of former course 267A–267B which dealt with heat convection.
 Prerequisite: course 230, courses 151 and 161 are recommended. Course 265 is not prerequisite to 266.
 Mathematical analysis of convection problems, including boundary layer theory and heat transfer during laminar and turbulent flow. Discussion of allied topics such as boiling, condensation, and mass transfer.
267. Heat Transfer: Thermal Radiation. (2) I. Mr. Snyder
 This course covers the portion of former course 267A–267B which dealt with thermal radiation.
 Prerequisite: course 151 is recommended (may be taken concurrently).
 Transfer of radiant energy, gaseous radiation, geometrical and spectral characteristics of radiant systems.
268. Advanced Problems in Thermodynamics. (3) II. Mr. Grossman
 Prerequisite: course 154 is recommended.
 The study of nonideal systems including problems in capillary thermodynamics, diffusional processes, catalytic reactions and combustion. An introduction to the Third Law, statistical mechanics, statistical thermodynamics, and the quantum mechanical treatment of rate processes.
271. Theory of Pumping Machinery. (3) II. Mr. Folsom
 Prerequisite: course 161 or 162 is recommended.
 The design and performance of all types of pumping machinery.
272. Flow in Porous Media. (3) II. Mr. Putnam
 Prerequisite: course 162 or Mathematics 270 is recommended.
 Applications of fluid mechanics and thermodynamics to flow of single-phase and multiphase fluids in porous media, with application to reservoir problems.
- Technical Hydrodynamics (see Mathematics 270).
276. Mechanics of Real Fluids. (3) II. Mr. Laitone
 Prerequisite: course 230. Courses 161 and 162 are recommended.
 Theory of viscous and turbulent flow with applications to fundamental flow problems.
277. Compressible Fluids. (3) I. Mr. Laitone
 Prerequisite: course 230. Course 162 or Mathematics 270 is recommended.
 Fundamentals of subsonic and supersonic flow, shock waves, different theoretical methods, laboratory equipment, and procedures for supersonic investigations.
298. Group Studies, Seminars, or Group Research. (1–5) I and II.
The Staff (Mr. Folsom in charge)
 Seminars may be organized in appropriate fields such as aerodynamics, air conditioning, dynamics, pressure vessel design, thermodynamics, heat transfer, Diesel engines, gas turbines, automatic control, and lubrication. Students may enroll in one or more separate subjects.
- 299A–299B. Individual Study or Research. (1–5; 1–5) Yr. Beginning each semester.
The Staff (Mr. Schade in charge)
 Investigation of advanced mechanical engineering problems. Students enrolled in this course will attend the weekly research conference.

MINERAL TECHNOLOGY**Ceramic Engineering**

100. The Ceramic Industry. (2) II. Mr. Pask
 Prerequisite: junior standing in engineering, in the College of Chemistry, or in the College of Letters and Science with a major in geology, chemistry, or physics.
 Survey of technology and economics of the ceramic industry including structural clay products—building materials; refractories—high temperature resistant materials; whitewares or pottery including porcelains, earthenware, art pottery, tiles; clays; porcelain enamels—glass coatings on metals; cements; and artificial abrasives.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II. Mr. Pask
 Prerequisite: senior standing in engineering.
 Group study of selected topics pertaining to nonmetallic minerals and to the problems of the different divisions of the ceramic industry.
199. Individual Studies or Research for Advanced Undergraduates. (1-5) I and II. Mr. Pask
 Prerequisite: senior standing in engineering, in the College of Chemistry, or in the College of Letters and Science with a major in geology, chemistry, or physics.

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 163)
298. Group Studies, Seminars, or Group Research. (1-5) I and II. Mr. Pask
 Prerequisite: graduate standing.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Mr. Pask
 Prerequisite: graduate standing.

Metallurgy**LOWER DIVISION COURSES**

- 2A. Metallurgical Analysis. (3) I. Mr. Klein
 One lecture and two laboratory periods.
 Prerequisite: Chemistry 1B with grade C or higher.
 Quantitative analysis of ores, metals, and metallurgical products.
- 2B. Metallurgical Analysis. (3) II. _____
 One lecture and two laboratory periods.
 Prerequisite: course 2A and Mineralogy 4A.
 Fire assaying of gold and silver ores and solutions. Also the assay of base bullions for the precious metals and fire methods of assay for some of the base metals.

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and the completion of the junior status examination.

- *102. General Metallurgy. (2) I. _____
 Prerequisite: Chemistry 1A-1B, Physics 4A, 4B, 4C.
 A brief survey of metallurgical materials and processes including the valuation and treatment of mineral raw materials; typical operations in process metallurgy and the structure, properties, and uses of metals and alloys.
- *106. Metallurgy of Iron and Steel. (2) II. _____
 Prerequisite: junior standing in engineering, chemistry, or equivalent.
 A general survey of the iron and steel industry.

* Not to be given, 1949-1950.

108. Mineral Concentration. (3) I. Mr. Mitchell
 Prerequisite: course 2B and Mineralogy 4B.
 The principles and practices of mineral concentration; sampling, conventional milling processes, and equipment with particular emphasis on underlying principles; mill arrangement; economics of mineral concentration.
- 110A. Mineral Concentration—Laboratory. (2) II. Mr. Mitchell
 Enrollment limited to twenty students.
 Prerequisite: course 108.
 Laboratory practice in the fundamental operations involved in mineral concentration; crushing, sampling, grinding, screening, classification, gravity concentration and flotation; quantitative work on the separation and recovery of the valuable constituents of ores.
- 110B. Metallurgical Laboratory. (2) I. Mr. Mitchell
 Prerequisite: course 110A.
 Experimental work in the treatment of ores of the nonferrous and precious metals; flotation, amalgamation, the cyanide process; and other wet and dry methods for extracting and recovering metallic products.
112. Nonferrous Pyrometallurgy. (3) I. ———
 Prerequisite: course 102 or 108.
 Treatment of ores and products by high temperature methods; metallurgical fuels; roasting, sintering, smelting, and distillation equipment; slags, metallurgical smoke; refining of metallurgical products and separation of precious metal values, with particular reference to copper, lead, and zinc; electrothermal processes.
114. Hydrometallurgy. (3) II. Mr. Mitchell
 Prerequisite: course 108 or 112.
 Processes employed in the extraction of metals from ores and mineral products by the use of aqueous solvents; the cyanide process; electrolytic zinc; hydrometallurgical treatment of copper ores and mineral products; the electrolytic refining of copper and other metals.
- *140. Metallurgical Thermodynamics. (3) I. Mr. Mitchell
 Prerequisite: Chemistry 110B and senior standing.
 The principles of thermodynamics with emphasis on application to metallurgical problems.
- 150A. Physical Metallurgy. (3) I. Mr. Hultgren
 Two lectures and one laboratory period.
 Prerequisite: Chemistry 1A-1B, Physics 4A, 4B, 4C.
 Relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys; the metallic state, phase diagrams and interpretation of microstructures from them; deformation and recrystallization of metals, metallography, and heat treatment of iron and steel.
- 150B. Physical Metallurgy. (3) II. Mr. Hultgren
 Two lectures and one laboratory period.
 Prerequisite: course 150A or Engineering 40 and course 152.
 A continuation of course 150A. Ternary phase diagrams and alloy steels, cast iron, X-ray metallography, physical properties of metals and the periodic table, metallography of the nonferrous metals.
152. Physical Metallurgy. (1 or 2) I. Mr. Hultgren
 Prerequisite: Chemistry 1A-1B, Physics 4A, 4B, 4C.
 The lecture part of course 150A. Students who have taken Engineering 40 may enroll for 1 unit credit only.

* Not to be given, 1949-1950.

- 152L. Physical Metallurgy Laboratory. (1) I. _____
Prerequisite: open only to students who have had course 152 in a previous year.
The laboratory part of course 150A.
154. Advanced Metallography. (3) II. _____
Prerequisite: courses 150A, 150B, 106.
Advanced laboratory work in metallography, including the synthesis, heat treatment, and metallographic study of alloys; theory and practice of photomicrography. Occasional lectures, conferences, and outside reading. The student is encouraged to pursue projects in the line of his particular interest.
160. X-Ray Metallography. (3) I. Mr. Parker
Two lectures and one laboratory period.
Prerequisite: course 150A or Engineering 40 and course 152.
Generation of X rays and the application of X-ray diffraction to the study of metals and alloys; phase diagram determination, particle size, internal stresses, cold work, recrystallization, preferred orientation; crystal structure determinations and phase identification.
- 170A. Properties of Metals. (3) I. Mr. Dorn
Prerequisite: Civil Engineering 108A and either course 150A or Engineering 40.
Engineering properties of metals and their function in design, selection and specification; analysis of the static, impact, endurance, and creep resistance of metals under combined stresses; discussions of nature of wear resistance and corrosion resistance of metals.
- 170B. Properties and Forming of Metals. (3) II. Mr. Dorn
Prerequisite: course 170A.
A study of the application of the principles of elasticity, plasticity, and the properties of metals to the solution of problems in machining and plastic forming of metals.
172. Inspection of Metals. (2) I. Mr. Parker
Prerequisite: course 150A or Engineering 40.
Lectures and laboratory instruction on the industrial techniques for inspection of metals; the principles and application of visual inspection, macrography, magnetic, and fluoroscopic methods of testing; the theory of X-ray radiography and its application to metal inspection.
174. Metallic Reaction Rates. (3) II. Mr. Dorn
Prerequisite: course 150A (or Engineering 40 and course 152) and Chemistry 110A-110B. Mathematics 110A-110B recommended.
A study of the application of the principles of kinetics of metallurgical reactions, diffusion, and heat transfer to the problems of casting, heat treating, and welding of metals.
176. Metallurgy of Welding. (3) II. Mr. Parker
Prerequisite: course 150A (or Engineering 40 and course 152).
Metallurgical problems associated with welding. The influence of welding technique on the metallurgical structures and properties of welds. A study of the origin and effect of weld defects.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Hultgren in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics.
199. Individual Studies or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Hultgren in charge)
Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- †202. Metallurgy of the Less Common Metals. (2) II. Mr. Mitchell
Prerequisite: courses 112 and 114.
- †210A-210B. Metallurgical Investigation. (2-3; 2-3) Yr. Mr. Mitchell
Program of work and credit to be arranged.
Prerequisite: courses 110B, 112, and 114.
250. Physics of Metals. (3) I. Mr. Hultgren
A theoretical study of the metallic state emphasizing those properties of technologic importance; chemical bonding forces, crystal structures of metals and alloys, compressibility, specific heat, magnetism, electrical and thermal conductivity, thermodynamics.
256. Reaction Kinetics in Metals. (3) I. Mr. Dorn
Prerequisite: course 150A and Chemistry 110A-110B.
Introduction to the application of statistical mechanics to reaction kinetics in metallic systems. Special emphasis will be given to analytical treatment of recrystallization, phase transformations including decomposition of austenite and precipitation hardening, diffusion in metals, and the hardenability of steels.
260. Properties of Single Metal Crystals. (3) II. Mr. Parker
Lectures and laboratory work.
Prerequisite: course 160 and graduate standing.
Preparation of metallic single crystals, stress strain relationships for crystals having different orientations, theories of strain hardening, internal friction, magnetic properties, preferred orientation in polycrystalline materials, orientation determination and pole figures, relation between properties of single crystal and polycrystalline materials.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
The Staff (Mr. Hultgren in charge)
- 299A-299B. Individual Study or Research (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. Hultgren in charge)

Research Conference in Physical Metallurgy. (No credit) I and II.
The instructing staff and graduate students meet once a week to discuss research and advanced subjects.

Mining

LOWER DIVISION COURSE

1. Mine Surveying. (3) II. Mr. York
Prerequisite: Engineering 1A-1B.
Surface and underground mine surveys. Preparation of mine maps.

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

101. Survey of the Mineral Industry. (3) II. Mr. Hall
Prerequisite: Geology 1, Mineralogy 4B, Mathematics 4A.
Raw materials, beneficiation of raw materials, marketing products; organization of the industry. Elements of mining, prospecting, sampling; breaking and supporting ground; haulage, drainage, ventilation; driving of development workings.

† To be given if a sufficient number of students enroll.

103. Mineral Exploitation. (3) I. Mr. Hall
Prerequisite: Geology 1, Mathematics 4A, Mineralogy 4A-4B, course 101.
Methods of mining mineral deposits; factors affecting choice of a mining method. Description, with emphasis on principles involved, of the various mining methods. Mine design; practice in the laying out of extraction openings and the design of stopes for the purpose of mining ore bodies.
- 105A. Mining Machinery and Equipment. (4) I. Mr. York
Two lectures and two laboratory periods.
Prerequisite: Engineering 35, Engineering Design 102B, and Electrical Engineering 101.
The compression of air and its use in mining. Rock drills, explosives, steam and gas power.
- 105B. Mining Machinery and Equipment. (4) II. Mr. York
Two lectures and two laboratory periods.
Prerequisite: Engineering 35, Engineering Design 102B, Electrical Engineering 101.
Discussion of power, transportation, drainage, ventilation, and lighting.
- 107A. Economics of Mineral Industry. (2) I. Mr. Wisser
Prerequisite: course 101, Geology 106 and 108.
Mining as a business. Organization of companies; financing. Federal and state regulation. Principles of investment and risk; efficiency, cost (including taxation). Redemption of capital. Marketing of products. Trends of demand, production, consumption, prices.
- 107B. Valuation of Mines. (3) II. Mr. Wisser
Prerequisite: courses 101, 111A, and 107A.
Valuation of prospects and developed mines. In the case of the latter: measurement of ore supply; estimations of probable costs and profits, present value of profit in sight. Geological and economic factors in mine valuation.
109. Administrative and Operating Records and Reports. (2) I. Mr. York
Prerequisite: course 103 taken concurrently.
Mine accounting and cost-keeping, labor records, purchase and distribution of supplies, production records, depreciation, preparation and use of cost data, administrative reports.
- 111A-111B. Mineral Exploration. (3-3) Yr. Mr. Wisser
Prerequisite: course 101, Geology 102A-102B, 103, and 106, Engineering 35.
Methods of exploring for commercial mineral deposits: geologic mapping, sampling, exploratory drilling, geophysical methods. Assembly and analysis of data secured. Structural analysis of mineralized districts from the standpoint of the mechanics of rock deformation; application to the search for valuable minerals.
113. Mine Rescue and First Aid. (1) II. Evening classes (for opening dates see official bulletin board).
Mr. York and the U. S. Bureau of Mines Safety Station Staff
Open only to upper division students in the mining, petroleum engineering, metallurgy, and mineral exploration programs of study.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. York in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics.

199. Individual Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. York in charge)
Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201. Investigations in Mining Practice. (2-3) I and II. Mr. York
Prerequisite: courses 103, 105A-105B.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
Prerequisite: graduate status. The Staff (Mr. York in charge)
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. York in charge)
Prerequisite: graduate status.

Petroleum Engineering

UPPER DIVISION COURSES

The prerequisite for all upper division courses is satisfaction of lower division requirements and completion of the junior status examination.

Course 117 is prerequisite to courses 119, 121A-121B, 123A-123B, 125, and 129.

117. The Petroleum Industry. (2) I. Mr. Carlson
Prerequisite: junior standing in engineering; open also to juniors in the College of Letters and Science whose major is geology or chemistry.
A general introductory review of the technology and economics of the several divisions of the petroleum industry.
119. Petroleum Products Testing. (2) II. Mr. Carlson
Laboratory determinations and studies of physical and chemical properties of petroleum and its products that are of importance in technical studies and specifications.
- 121A. Oil Field Development. (3) I. Mr. Somerton
Petroleum exploration; principles of oil field development; methods of drilling and controlling oil and gas wells.
- 121B. Petroleum Production Methods. (3) II. ———
Exploitation of oil fields; drainage of petroleum from its reservoir rocks; methods of extracting oil from wells; separation of water, sand, and gas from oil; transporting and storing petroleum.
- 123A. Petroleum Engineering Laboratory (3) I. Mr. Somerton
Prerequisite: course 119; complementary to course 121A, which should be taken concurrently.
Investigation of special problems in oil field development; laboratory studies of core samples from drilling wells, drilling fluids, oil well cements, oil well surveying instruments and methods, logging techniques; and analysis of ground waters associated with oil deposits.
- 123B. Petroleum Engineering Laboratory. (3) II. Mr. Somerton
Prerequisite: course 119; complementary to course 121B, which should be taken concurrently.
Investigation of special problems in petroleum production; laboratory studies of petroleum reservoir conditions and behavior; primary and secondary production methods; handling of oil at the surface. Field trips to oil-producing properties.

125. Petroleum Production Economics. (3) II. _____
 Prerequisite: course 121A.
 Geographic distribution of oil and gas reserves; conservation of oil and gas resources; proration practices and production control; capital requirements and financial results; corporate organization of oil-producing companies; management of oil-producing enterprises; labor in oil production; development and production cost accounting; land acquisition and control.
127. Oil Field Mapping Practice. (2) I. Mr. Carlson
 Lecture and laboratory.
 Prerequisite: Engineering 1A-1B, 22 and 23, course 121A (may be taken concurrently).
 Preparation of field and property maps and well logs; development of geologic sections and structure—contour maps and models from well log data.
129. Production and Utilization of Natural Gas. (2) I. Mr. Somerton
 Control and management of gas wells; valuation of gas-producing properties; metering, compression, and transmission of natural gas; its domestic, industrial, and chemical utilization; extraction and manufacture of gasoline from natural gas; cycling and condensate production.
- 131A-131B. Oil Reservoir Engineering. (2-2) Yr. Mr. Miller
 Prerequisite: Mechanical Engineering 103, 105A or Chemistry 109, Mathematics 110A-110B.
 Characteristics of naturally occurring underground petroleum-productive reservoirs and their associated fluids (oil, gas, and water). Fluid behavior in porous media and applications of fluid mechanics and thermodynamics to oil-reservoir performance problems.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Somerton in charge)
 Prerequisite: senior standing in engineering.
 Group study of selected topics.
199. Individual Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Somerton in charge)
 Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 207A. Fundamentals of Reservoir Engineering. (2) I. Mr. Putnam
 Prerequisite: Mathematics 110, Chemistry 109, or Mechanical Engineering 154.
 Thermodynamic, volumetric, and phase behavior of reservoir fluids. Characteristics and properties of reservoir rocks. Fundamentals of multi-phase fluid flow in porous media.
- 207B. Fundamentals of Reservoir Engineering. (2) II. Mr. Putnam
 Prerequisite: Mathematics 110. Recommended: course 207A, Mechanical Engineering 162 or 272.
 Advanced topics in oil and gas reservoir mechanics including reservoir performance studies.
- 209A. Seminar in Petroleum Refining. (2-3) I. Mr. Carlson
 Prerequisite: course 119 and completion of program of study in process engineering or chemical engineering.
 Modern petroleum refinery practice. Technology of petroleum processing. Plant operation.

- 209B. Seminar in Petroleum Refining. (2-3) II. Mr. Carlson
Prerequisite: course 209A or consent of the instructor.
• Evaluation of crude oils, raw stocks, and finished products. Study of factors which determine plan of processing in a petroleum refinery.
- *213. Valuation of Oil- and Gas-Producing Properties. (2) II. Mr. Uren
Prerequisite: course 121A-121B.
A study of the physical and economic factors underlying the appraisal of oil-producing properties. Estimation and evaluation of oil and gas reserves.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
Prerequisite: graduate standing. The Staff (Mr. Putnam in charge)
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. The Staff (Mr. Putnam in charge)
Prerequisite: graduate standing.

TRANSPORTATION AND TRAFFIC ENGINEERING

UPPER DIVISION COURSES

See Civil Engineering 101, 102A-102B, 104, 105, 106, 108G, 108H, 113, 171, 175, for specific courses relating to transportation.

190. Traffic Engineering for Police. (2) II. Mr. D. S. Berry
Prerequisite: upper division standing and one course in statistics.
Engineering studies of traffic volumes, speeds, parking, and accidents, and analysis of data in applying traffic signs, signals, and markings, and other traffic regulations. Driver behavior and limitations. Characteristics of vehicle operation. For majors in police administration and public administration.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. H. E. Davis in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics in transportation engineering.
199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. H. E. Davis in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201. Highway Planning and Economics. (3) I. Mr. Moyer
Prerequisite: graduate standing. Seniors majoring in transportation engineering may be admitted if approved by the instructor.
A comprehensive study of highway planning surveys, methods, and results; application of results of planning surveys in programming highway improvements; economic analysis of highway improvements; urban traffic studies and planning urban street improvements; parking and zoning studies; highway finance.
202. Advanced Highway Design. (3) II. Mr. Moyer
Prerequisite: graduate standing. Seniors majoring in transportation engineering may be admitted if approved by the instructor.
An advanced study of the location and design of various types and classes of highways. Emphasis is placed on advanced theory and practice in the design of alignment, highway cross sections, intersections, interchanges, multi-lane expressways and arterial highways in urban areas.
210. Traffic Engineering. (3) I. Mr. D. S. Berry
Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.
Analysis of basic characteristics of traffic movement, such as volumes,

* Not to be given, 1949-1950.

- speeds, origins and destinations, delays, road capacity, and accidents. Techniques for making traffic engineering investigations.
- 210L. Traffic Engineering Laboratory. (1) I. Mr. D. S. Berry, Mr. Van Til
Prerequisite: course 210 (may be taken concurrently).
Field and laboratory practice in making traffic engineering investigations and analysis of data. Vehicle performance.
211. Traffic Engineering: Operations. (3) II. Mr. D. S. Berry
Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.
Theory and practical application of street and highway traffic engineering restrictions and uniform traffic control devices. Traffic engineering administration.
220. Highway and Airport Surfaces. (3) I. Mr. H. E. Davis
Prerequisite: graduate standing in engineering.
An advanced study of the theories, principles, and practices in the design, construction, and maintenance of highway and airport surfaces, including soil stabilization, design of rigid and flexible pavements, accelerated traffic and loading tests, and the design of asphaltic mixtures.
270. Airport Engineering. (3) II. _____
Prerequisite: graduate standing.
The selection of site, and the planning, design, and construction of airports.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
The Staff (Mr. H. E. Davis in charge)
Prerequisite: graduate standing.
Seminars, or integrated group studies in selected advanced subjects in transportation engineering.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. H. E. Davis in charge)
Prerequisite: graduate standing.
Research or investigation in selected advanced subjects in transportation engineering.

ENGLISH

- MYRON F. BRIGHTFIELD, Ph.D., Professor of English.
ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology.
BERTRAND H. BRONSON, Ph.D., Professor of English.
JAMES R. CALDWELL, Ph.D., Professor of English.
JAMES M. CLINE, Ph.D., Professor of English.
WILLARD H. DURHAM, Ph.D., Professor of English.
WILLARD E. FARNHAM, Ph.D., Professor of English (Chairman of the Department).
BENJAMIN H. LEHMAN, Ph.D., Professor of English.
GUY MONTGOMERY, Ph.D., LL.D., Professor of English.
GEORGE R. POTTER, Ph.D., Professor of English.
MARK SCHORER, Ph.D., Professor of English.
GEORGE R. STEWART, Ph.D., Professor of English.
WALTER M. HART, Ph.D., LL.D., Professor of English, Emeritus.
BENJAMIN P. KURTZ, Ph.D., Professor of English, Emeritus.
G. DUNDAS CRAIG, M.A., Litt.D., Assistant Professor of English, Emeritus.

- JAMES D. HART, Ph.D., Associate Professor of English (Vice-Chairman of the Department).
 ARTHUR E. HUTSON, Ph.D., Associate Professor of English.
 GORDON MCKENZIE, Ph.D., Associate Professor of English.
 JOSEPHINE MILES, Ph.D., Associate Professor of English.
 †LYNN B. BENNION, Ph.D., Assistant Professor of English.
 TRAVIS BOGARD, Ph.D., Assistant Professor of English.
 EVERETT CARTER, Ph.D., Assistant Professor of English.
 R. BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.
 *ROBERT GRINNELL, Ph.D., Assistant Professor of English.
 SEARS R. JAYNE, Ph.D., Assistant Professor of English.
 JOHN E. JORDAN, Ph.D., Assistant Professor of English.
 HAROLD D. KELLING, Ph.D., Assistant Professor of English.
 JAMES J. LYNCH, Ph.D., Assistant Professor of English.
 CHARLES S. MUSCATINE, Ph.D., Assistant Professor of English.
 JOHN H. RALEIGH, Ph.D., Assistant Professor of English.
 BREWSTER ROGERSON, Ph.D., Assistant Professor of English.
 †WAYNE SHUMAKER, Ph.D., Assistant Professor of English.
 EDWIN S. FUSSELL, Ph.D., Instructor in English.
 THOMAS F. PARKINSON, Ph.D., Instructor in English.
 DAVID W. REED, Ph.D., Instructor in English.
 ERNEST TUVESON, Ph.D., Instructor in English.



- SHERIDAN W. BAKER, M.A., Lecturer in English.
 FREDERIC I. CARPENTER, Ph.D., Lecturer in English.
 EDITH D. HENRICH, A.B., Lecturer in English.
 MILTON MILLER, M.A., Lecturer in English.
 SETH P. ULMAN, M.A., Lecturer in English.
 ANITA WHISTLER, M.A., Lecturer in English.

Students must have passed Subject A before taking any course in English.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. Jordan, Chairman; Mr. Bogard, Mr. Carter, Mr. Cline, Mr. Parkinson.

The department offers alternative programs for the major: a program for the student who intends to become a candidate for the M.A. or the Ph.D. degree in English; a program for the general undergraduate.

(Since the group major in American Literature is being discontinued, attention is called to the fact that essentially the same program may be completed under either Plan I or Plan II of the English major.)

Plan I. The program for the general undergraduate is as follows:

(A) *Preparation for the Major.*—First Year—Required: course 1A-1B (3-3), Composition and Study of Literature. Second Year—Required: course 46A-46B (3-3) and 3 additional units to be elected from courses 30 (3), 41A-41B (3-3), 25 (3), 44A-44B (3-3), 49 (3).

(B) *The Major.*—Twenty-four units of upper division work with specific requirements as follows: Third Year—Required: the Junior Course, English

† Sabbatical leave in residence fall semester, 1949-1950.

* Absent on leave, 1949-1950.

100 (3): Methods and Materials of Literary Criticism. Fourth Year—Required: the Senior Course, English 151 (3).

The total program (lower and upper division) must include at least: 3 units in Chaucer or the Age of Chaucer, 3 units in Shakespeare, 3 units in the Age of Milton or 3 units in Milton and Donne, 3 units in American Literature, 3 units in a period or type course.

Plan II. The program for the undergraduate expecting to proceed to the M.A. or Ph.D. degree in English is as follows:

(A) *Preparation for the Major*.—First Year—Required: course 1A-1B (3-3), Composition and Study of Literature.

(B) *The Major*.—Twenty-four units of upper division work, with specific requirements as follows: Third Year—Required: the Junior Course, English 100 (3). Fourth Year.—Required: (a) a special section of the Senior Course, English 151 (3), studying a contemporary author, or possibly more than one author; (b) the Comprehensive Examination (3). The specific upper division requirements total 9 units. The remaining units are to be selected subject to the advice of a departmental adviser.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who do not maintain such an average will be required to withdraw from the major in English.

Attention is called to the requirements in foreign languages for higher degrees in English—a reading knowledge of French or German for the M.A.; of French, German, and Latin for the Ph.D. Undergraduates contemplating advanced study in English should prepare to satisfy these requirements as they proceed to the bachelor's degree.

Honor Students in the Senior Year.—See Honors course, page 302.

Teacher Training.—Consult Mr. R. B. Evans; see also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Higher Degrees.—Consult Mr. M. F. Brightfield; see also the ANNOUNCEMENT OF THE GRADUATE DIVISION.

LOWER DIVISION COURSES

FRESHMAN COURSE

1A-1B. First-Year Reading and Composition. (3-3) Yr. Beginning each semester.

Mr. Baker, Mr. Bennion, Mr. Bogard, Mr. Bronson, Mr. Caldwell, Mr. Carpenter, Mr. Carter, Mr. Cline, Mr. Evans, Mr. Fussell, Mrs. Henrich, Mr. Hutson, Mr. Jayne, Mr. Jordan, Mr. Kelling, Mr. Lehman, Miss Miles, Mr. Miller, Mr. Montgomery, Mr. Muscatine, Mr. Parkinson, Mr. Raleigh, Mr. Reed, Mr. Rogerson, Mr. Schorer, Mr. Shumaker, Mr. Tuveson, Mr. Ulman, Miss Whistler

Prerequisite: a passing grade in Subject A (examination or course).

1A. Training in writing and reading.

1B. An introduction to the study of literature, with further training in writing.

Prerequisite for the English major. Course 1A is prerequisite to 1B.

SOPHOMORE COURSES

25. Language. (3) I and II.

Mr. Hutson, Mr. Reed

I: Mr. Hutson; II: Mr. Reed.

The origins and symbols of human speech; patterns, change, and growth in language; the interrelations of language, thought, and civilization. Emphasis on English, as written and spoken in England and America. Designed for sophomores, but open to students in the upper division.

30. Introduction to American Literature. (3) II. Mr. Stewart
- 41A-41B. Writing in Connection with the Reading of Important Books of the Nineteenth and Twentieth Centuries. (3-3) Yr.
Mr. Lehman, Mr. Parkinson
41A: Mr. Lehman; 41B: Mr. Parkinson.
Prerequisite: course 1A-1B, Speech 1A-1B, or consent of the instructor.
Course 41A is not prerequisite to 41B.
- 44A-44B. Masterpieces of Literature. (3-3) Yr. Mr. Jayne
Lectures on great works of the world's literature.
Course 44A is not prerequisite to 44B.
- 46A-46B. Survey of English Literature. (3-3) Yr.
Mr. Bennion, Mr. Bogard, Mr. Cline, Mr. Hart, Mrs. Henrich,
Mr. Jordan, Mr. Lynch, Mr. McKenzie, Mr. Muscatine, Mr.
Parkinson, Mr. Raleigh, Mr. Rogerson, Mr. Tuveson
Prerequisite: course 1A-1B.
A general lecture each week will present the more important aspects of the history of English literature. In semiweekly sections typical work of the more significant authors from Chaucer to Hardy will be discussed.
49. Twelve Great Books in the English Tradition. (3) I. Mr. Cline
The course presents a history, not of English literature, but of English culture. The works selected are those which have expressed for the English people the great aspirations and achievements of the English nation. Readings and lectures.

UPPER DIVISION COURSES

Group I—Unrestricted Courses

(Open to all students in the upper division; enrollment not limited, except as noted)

- *154. Master Spirits of Literature: Great Dramatists, Ancient and Modern. (3) II. Mr. Durham
- 114A-114B. The English Drama. (3-3) Yr. Mr. Durham
114A. From the miracle plays to 1642.
114B. From 1642 to the present.
Course 114A is not prerequisite to 114B.
- 125C-125D. The Novel. (3-3) Yr. Mr. Lehman, Mr. Raleigh
125C: Mr. Lehman; 125D: Mr. Raleigh.
Course 125C is not prerequisite to 125D.
116. The English Bible as Literature. (3) II. Mr. Potter
- 117A-117B. Shakespeare. (3-3) Yr. Mr. Farnham, Mr. Montgomery
117A: Mr. Farnham; 117B: Mr. Montgomery.
Lectures on the entire works of Shakespeare, including nondramatic poems. Open to both majors and nonmajors. Course 117A is not prerequisite to 117B.
- 117E. Shakespeare. (3) I. Mr. Durham
Lectures on fifteen plays of Shakespeare. May not be taken by students whose major is English.
- *120. The Backgrounds of English Literature in the Middle Ages. (3) I. Mr. Grinnell
A survey of medieval culture as it bears on English literature. Lectures and readings in the following fields of medieval literature: history, biography, poetry, drama, and philosophy
155. The Age of Chaucer. (3) I. Mr. Muscatine

* Not to be given, 1949-1950.

156. The Age of Elizabeth. (3) II. Mr. Cline
 157. The Age of Milton. (3) I. Mr. Potter
 166. The Age of Swift and Pope. (3) I. Mr. Tuveson
 119. The Age of Johnson. (3) II. Mr. Bronson
 121. The Romantic Period. (3) II. Mr. Caldwell
 122. The Victorian Period. (3) II. Mr. McKenzie
 123. Nineteenth-Century Prose. (3) I. Mr. Jordan
 149. The English Lyric. (3) II. Mr. Rogerson
 The development of the English traditions of structure and style in lyric poetry.
 160. British Literature from 1900 to the Present. (3) I. Mr. Schorer
 128. Regional Literature: California and the West. (2) I. Mr. Hart
 130A. American Literature before 1840. (2) I. Mr. Fussell
 130B. American Literature: 1840-1885. (3) II. Mr. Carter
 130C. American Literature: 1885 to the Present. (3) II. Mr. Hart
 131. American English. (3) I. Mr. Reed
 General description of the English language in America. Comparisons with British English. American regional dialects.
 110. The English Language. (3) I and II. Mr. Hutson, Mr. Reed
 I: Mr. Hutson; II: Mr. Reed.

Group II—Restricted Courses**A. THE JUNIOR COURSE**

(Sections limited to twenty students each)

Designed primarily for juniors whose major subject is English.

100. Methods and Materials of Literary Criticism. (3) I and II.

Mr. Bennion, Mr. Bogard, Mr. Caldwell, Mr. Carter, Mr. Jordan, Mr. Kelling, Mr. McKenzie, Miss Miles, Mr. Parkinson, Mr. Rogerson, Mr. Shumaker

Explication and evaluation of literary texts and study of the various principles of literary judgment.

B. THE SENIOR COURSE

(Sections limited to twenty students each)

Designed primarily for seniors whose major subject is English; English 151K is prescribed for English majors working under Plan II.

Prerequisite: course 100.

- 151L. Chaucer. (3) I and II.

Mr. Brodeur, Mr. Hutson, Mr. Muscatine, Mr. Reed
I: Mr. Brodeur, Mr. Muscatine; II: Mr. Hutson, Mr. Muscatine, Mr. Reed.

- 151S. Shakespeare. (3) I and II.

Mr. Evans, Mr. Bogard

I: Mr. Evans; II: Mr. Bogard.

- 151J. Donne and Milton. (3) I and II.

Mr. Farnham, Mr. Potter, Mr. Shumaker
I: Mr. Potter; II: Mr. Farnham, Mr. Shumaker.

- 151Sp. Spenser (3) I.

Mr. Jayne

- 151D. Dryden. (3) I.

Mr. Montgomery

- *151E. Henry James. (3) I.

Mr. Raleigh

- 151Sw. Swift. (3) II.

Mr. Kelling

* Not to be given, 1949-1950.

151W. Whitman. (3) I. Mr. Carpenter

151K. Contemporary Authors. (3) I and II.

Mr. Fussell, Miss Miles, Mr. Parkinson, Mr. Schorer
I: W. B. Yeats, Mr. Parkinson; D. H. Lawrence, Mr. Schorer; II: T. S.
Eliot, Miss Miles; E. A. Robinson, Mr. Fussell.

198A-198B. Senior Preceptorial Course. (3-3) Yr.

Mr. Montgomery, Mr. Potter
Reading in chosen fields, with critical writing.
Primarily for English majors in Plan II.
A grade of B or better in 198A is required for admission to 198B.

C. HONORS COURSE

199. Special Study for Advanced Undergraduates. (1-3) I and II.

The Staff (Mr. Jordan in charge)
Reading and conference for individual honor students.

Any student who completes 9 or more units of upper division English in the junior year with an average grade of not less than B may apply for admission to English 199. Such honor students undertake, in a chosen field, a program of reading and of conferences with the instructor. The number of units of credit is determined by the instructor.

D. THE COURSE IN COMPOSITION

(Open only to upper division students who have the consent
of the instructor)

106A. Fiction. (3) II. Mr. Schorer

106B. Verse. (3) I and II. Mr. Caldwell, Miss Miles
I: Mr. Caldwell; II: Miss Miles.

106E. Nonfiction Narrative. (3) II. Mr. Stewart

106H. Expository and Critical Writing. (3) I and II.
Mr. Carpenter, Mrs. Henrich

106L. Advanced Composition. (3) I and II. Mr. Evans, Mr. Lynch
I: Mr. Lynch; II: Mr. Evans.

Primarily for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is English.

106M. Advanced Composition. (3) I and II. Mr. Evans, Mr. Lynch
I: Mr. Evans; II: Mr. Lynch.

Specifically for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is not English.

E. COMPREHENSIVE FINAL EXAMINATION

The Comprehensive Final Examination for Plan II of the undergraduate major in English must be taken at the end of the senior year. It will consist of three parts: a three-hour written examination on certain authors annually listed by the department; a three-hour examination on the practice and theory of literary criticism; and an oral examination of half an hour. The student should attend the general conferences held by the board during each semester, and may consult individually with the members of the board. The student's preparation for the examination presumably extends throughout the entire period of upper division residence. Upon the student's passing the examination the grade assigned by the department, with the appropriate grade points, will be recorded.

Given at the end of the fall and spring semesters and at the beginning of the fall semester.

Mr. Bennion, Mr. Bronson, Mr. Caldwell, Mr. Evans,
Mr. Lynch, Mr. Muscatine, Mr. Potter

TEACHERS' COURSE

300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II. Mr. Evans, Mr. Lynch

I: Mr. Evans; II: Mr. Lynch.

This course, designed for seniors and graduate students undertaking an English teaching major or minor, should be completed before practice teaching. The course is accepted in partial satisfaction of the 18-unit requirement in education for the secondary credential.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Students who have not passed the department's examination in French or in German will be admitted to a seminar only with the consent of the instructor.

French 206A-206B and German 265 are especially recommended to candidates for higher degrees. Attention is directed to German 204.

The following courses will be given as seminars: 210, 217, 218, 220A-220B, 225A-225B, 230A-230B, 247, 251, 252, 254A-254B, 257, 258, 259, 262, 269, 270.

Attention is directed to the fact that the period courses, 119, 120, 121, 122, 123, 155, 156, 157, 160, and 166, are particularly adapted to graduate study.

200. Techniques of Literary Scholarship. (3) I and II.

Mr. Brightfield, Mr. Lynch

I: Mr. Brightfield, Mr. Lynch; II: Mr. Brightfield.

Description and analysis of the techniques of literary research and criticism. Outlines of the progress of scholarship in the linguistic, historical, and critical study of English literature. Review and systematic arrangement of the aids to bibliographical research.

202. The History of English Criticism. (3) I.

Mr. Brightfield

- *204. Celtic Studies. (3) I and II.

Mr. Hutson

206. Problems in the Study of Literature. (3) I and II.

Mr. Jayne, Mr. Lehman, Miss Miles

Textual analysis, discussion of scholarly approaches, based on secondary reading; problems in the presentation of materials.

I: Seventeenth Century, Miss Miles; II: Sixteenth Century, Mr. Jayne; Comedy, Mr. Lehman.

- 211A. Old English Literature. (3) I.

Mr. Brodeur

Open to seniors by consent of the instructor.

Rapid reading of Old English texts.

- 211B. The Beowulf. (3) II.

Mr. Brodeur

- 211G-211H. Old and Middle English. (3-3) Yr.

Mr. Brodeur.

Prerequisite: a reading knowledge of German.

Development of the English language from its beginning as illustrated in representative texts. Especially designed for candidates for the Ph.D. degree.

213. Readings in Middle English. (3) I and II.

Mr. Hutson

Rapid reading of selections in Middle English, and perhaps some entire poems, from the twelfth century to the fifteenth.

210. Chaucer. (3) II.

Mr. Cline

Some knowledge of Chaucer and his language is presupposed.

217. Studies in Shakespeare. (3) II.

Mr. Durham

- 254A-254B. Elizabethan Drama. (3-3) Yr.

Mr. Farnham

218. Milton. (3) II.

Mr. Potter

* Not to be given, 1949-1950.

- *220A-220B. The Medieval Mind. (3-3) Yr. Mr. Grinnell
 220A. Readings in Medieval Latin.
 220B. Dominant Themes in Medieval Life.
 An introduction to the central language and literature of the Middle Ages, presupposing at least such a knowledge of Latin as may be gained in high school. Attention is called to the course Romance Philology 201, late Latin language and literature.
- *258. Johnson and His Contemporaries. (3) II. Mr. Bronson
- 251. Romantic Poets. (3) I. Mr. Caldwell
- *252. English Prose Fiction before 1740. (3) Mr. Brightfield
- 225A-225B. The Popular Ballad. (3-3) Yr. Mr. Bronson
- 230A-230B. American Literature. (3-3) Yr. Mr. Hart
262. Nineteenth-Century Literature. (3) II. Mr. Brightfield
247. Poetics: Seventeenth-Century Theory and Practice. (3) II. Miss Miles
 Special reference to a historical period, to be selected.
257. Literary Criticism, 1740-1820. (3) I. Mr. McKenzie
259. Theory of Art in the Eighteenth Century. (3) I. Mr. Rogerson
269. Theory of Fiction. (3) II. Mr. Schorer
270. Onomastics. (3) II. Mr. Stewart
 Study of the names of places and persons.
260. Special Study. (1-4) I and II. The Staff (Mr. Brightfield in charge)
 The members of the department are variously engaged in particular research and stand ready to advise and direct properly qualified graduate students in their several fields. Some indication of fields of interest is here-with suggested:
1. Critical Theory (Brightfield, Caldwell, McKenzie, Miles, Schorer).
 2. Prose Fiction (Brightfield, Lehman, Raleigh, Schorer).
 3. Drama (Bogard, Durham, Evans, Farnham).
 4. Linguistics (Brodeur, Hutson, Reed).
 5. Early Germanic Literature (Brodeur)
 6. Celtic (Hutson).
 7. The Ballad (Bronson).
 8. Chaucer and the Middle Ages (Brodeur, Caldwell, Cline, Grinnell, Muscatine).
 9. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Cline, Farnham, Jayne, Miles, Potter).
 10. Eighteenth Century (Bronson, Kelling, Lynch, Montgomery, Rogerson, Schorer).
 11. Nineteenth Century (Brightfield, Caldwell, Jordan, Lehman, McKenzie, Shumaker).
 12. American Literature (Carter, Hart, Stewart).

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.

Classics 34. Epic Poetry: Homer and Vergil.

178. Greek and Roman Mythology.

180A-180B. The Latin Classics in English.

Dramatic Art 157A-157B. Modern European Drama.

* Not to be given, 1949-1950.

- French 39A-39B-39C. French Literature in English Translation.
122A-122B. Readings in French Literature of the Middle Ages.
- German 39A-39B-39C-39D. Great Writers in German Literature.
- Italian 150A-150B. Dante's *Divine Comedy* in English Translation.
151A-151B. The Renaissance.
- Oriental Languages 112A-112B. Survey of Chinese Literature and Literary Criticism.
132. History of Japanese Literature.
- Scandinavian Languages 100A-100B. History of Scandinavian Literature.
106. History of Scandinavian Drama.
- Slavic Languages 130. Introduction to Russian Literature.
131. Recent Russian Literature (1880-1947).
132. Russian Literature since 1917.
133A-133B. Russian Novelists of the Nineteenth Century (except Tolstoy and Dostoyevski).
133C-133D. Tolstoy and Dostoyevski.
134. Russian Literature and Folklore.
135. The Russian Drama.
138. Modern Russia.

FORESTRY

FREDERICK S. BAKER, F.E., Professor of Forestry (Chairman of the Department).

PERCY M. BARR, Ph.D., Sc.D., Professor of Forestry.

JOSEPH KITTREDGE, Ph.D., Professor of Forestry.

MYRON E. KRUEGER, M.S., Professor of Forestry.

ARTHUR W. SAMPSON, Ph.D., Professor of Forestry.

WALTER MULFORD, F.E., Sc.D., Professor of Forestry, Emeritus.

HAROLD H. BISWELL, Ph.D., Associate Professor of Forestry.

ROBERT A. COCKRELL, Ph.D., Associate Professor of Forestry.

EMANUEL FRITZ, M.E., M.F., Associate Professor of Forestry.

ROBERT N. COLWELL, Ph.D., Assistant Professor of Forestry.

JOHN A. ZIVNUSKA, Ph.D., Assistant Professor of Forestry.

EDWARD C. STONE, Ph.D., Instructor in Forestry.



HENRY J. VAUX, Ph.D., Lecturer in Forestry.

Letters and Science List.—Courses 1, 103, and 125 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

LOWER DIVISION COURSES

1. Elements of Forestry. (3) I.

Mr. Cockrell

Not open to students with a major in forestry.

Forests in their relation to national life; the life history of the tree and the forest; general principles of forestry.

49A-49B. Field Practice Course. No credit.

Prerequisite: Engineering 1A-1B, Botany 1, and an average grade of C or higher.

Twelve weeks' summer field practice course at Meadow Valley, in the Plumas National Forest.

Field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging and milling operations.

Course 49A-49B and an average grade of C or higher are prerequisite to admission to the School of Forestry.

UPPER DIVISION COURSES

100. Introduction to Professional Forestry. (3) I. Mr. Baker
 Open only to students whose major is forestry.
 The branches of forestry; their significance and relationships; values derived from forests; forest policy.
101. Introduction to Range Management. (3) II. Mr. Sampson
 Development and present status; its place in forestry and in agriculture; economic relationships; treatment of the range and handling of livestock on it.
102. Range Management Technique. (3) II. Mr. Sampson
 Lecture and laboratory.
 Prerequisite: Engineering 1A-1B; Chemistry 8; an elementary course in statistics; course 103 or Botany 151. The additional prerequisites of course 101 and Botany 108 may be taken concurrently.
 Field and laboratory procedure, designed especially for students who plan to take advanced work in range management. Special field trips will be arranged.
103. Principles of Forest Ecology. (3) I. Mr. Stone
 Prerequisite: Botany 1, Chemistry 1A.
 Structure of the plant as modified by conditions of habitat; plant succession and societies.
104. Silviculture. (4) I. Mr. Baker
 Lecture and laboratory.
 Prerequisite: course 103.
 Methods of governing growth and reproduction of forests through the application of ecological laws.
106. Forest Planting. (3) II. Mr. Colwell
 Lecture, laboratory, and field trips.
 Prerequisite: Botany 1.
 Artificial establishment of forests from collection of seed to planting of trees; the physiological, environmental, and genetic factors affecting survival and growth of forest seedlings; financial aspects of forest plantations.
108. Dendrology. (4) I. Mr. Stone
 Lecture, laboratory, and field trips.
 Prerequisite: Botany 1.
 Identification by morphological characters of important forest trees of North America; their ecological and geographical distribution; field identification of many forest shrubs.
110. Forest Mensuration. (3) II. Mr. Zivnuska
 Lecture and conference.
 Prerequisite: a course in elementary statistics; course 49A-49B or consent of the instructor.
 Principles underlying log scaling and the estimation of timber volume and value; growth of stands; the application of statistical analysis to forest measurements.
112. Lumber Manufacturing. (3) I. Mr. Fritz
 Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with the consent of the instructor.
 Organization and characteristics of the lumber industry; the manufacture of lumber from log pond to finished product; seasoning, grading, marketing.

114. Wood Technology. (3) II. Mr. Fritz
 Lecture and laboratory.
 Prerequisite: Chemistry 1A, Botany 1.
 Junior and senior students from other departments may be admitted with the consent of the instructor.
 Anatomy of wood; properties and uses; identification of commercial species.
115. Physical Properties of Wood. (3) I. Mr. Cockrell
 Lecture and laboratory.
 Prerequisite: Physics 2A-2B, 3A-3B, and senior standing.
 Density, moisture relations, shrinking and swelling, strength, thermal, electrical, and acoustic properties of wood.
118. Forest Engineering. (3) II. Mr. Krueger
 Lecture and laboratory.
 Prerequisite: Engineering 1A-1B, Physics 2A-2B.
 Engineering methods involved in logging and forest management.
120. Management of Forest Properties. (4) II. Mr. Barr
 Lecture and laboratory.
 Prerequisite: courses 104 and 110.
 Economic and technical principles involved in the management of forest lands for the continuous production of timber crops.
121. Forest Economics. (3) I. Mr. Vaux
 Prerequisite: 6 units of economics and senior standing. Senior and graduate students from other departments may be admitted with the consent of the instructor.
 Economic problems and principles involved in the utilization of forest land and timber, and in the distribution of forest products.
122. Forest Policy. (3) I. Mr. Vaux
 Prerequisite: 6 units of economics and senior standing.
 The evolution of forest policy in the United States. State and national forest policies. Policy objectives, programs, and groups. Analysis of current policy problems.
123. Range Utilization. (3) I. Mr. Biswell
 Lecture, laboratory, and field trips.
 Prerequisite: courses 101 and 103; Botany 111 and senior standing.
 Recommended: course 102.
 Range use and forage valuations as integral parts of land use planning, including technical problems of range management.
125. Forest Influences. (3) I. Mr. Kittredge
 Lecture and laboratory or field trips.
 Prerequisite: course 103, Physics 2A-2B, senior standing. Recommended: Soil Science 100 and Geography 111.
 The influence of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. Production Methods in the Forest Industries. (3) II. Mr. Krueger
 Prerequisite: 6 units of economics and senior standing.
 Production methods and principles involved in logging; cost analyses.
128. Forest Protection. (3) II. _____
 Junior and senior students from other departments may be admitted with the consent of the instructor.
 One field trip required.
 Forest fire behavior; ignition and spread of forest fires and factors by which they are influenced; forest fire control organization and equipment; methods of fire prevention and suppression.

132. Forest Photogrammetry. (3) II. Mr. Colwell
Lecture and laboratory.
Limited to forty-two students.
The construction of planimetric and topographic maps from vertical and oblique aerial photographs. The use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of aerial photo mosaics.
198. Directed Group Study. (1-5) I and II. The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of the instructor.
Group study, or investigation, of special problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of the instructor.
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 201A-201B. Seminar in Forestry. (2-2) Yr. Mr. Kittredge, Mr. Krueger
201A: Mr. Kittredge; 201B: Mr. Krueger.
Course 201A is not prerequisite to 201B.
- 202A-202B. Research in Forestry. (1-6; 1-6) Yr.
The Staff (Mr. Baker in charge)
Course 202A is not prerequisite to 202B.
- 203A-203B. Seminar in Forest Influences and in Forest Ecology. (2-2) Yr.
Mr. Kittredge, Mr. Sampson
203A: Mr. Kittredge; 203B: Mr. Sampson.
Prerequisite: plant physiology (3 units); course 125 for course 203A; course 103 and Chemistry 8 for course 203B. Course 203A is not prerequisite to 203B.
204. Seminar in Silviculture. (2) I. Mr. Baker
Prerequisite: course 104.
205. Seminar in Wood Technology. (2) I. Mr. Cockrell
Prerequisite: course 114.
206. Seminar in Forest Management. (2) II. Mr. Barr
Prerequisite: course 120, 6 units of economics.
- 207A-207B. Seminar in Forest Economics. (2-2) Yr. Mr. Vaux, Mr. Krueger
207A: Mr. Vaux; 207B: Mr. Krueger.
Prerequisite: 12 units of economics, agricultural economics, or forest economics. Course 207A is not prerequisite to 207B.
208. Seminar in Range Management. (2) I. Mr. Biswell
Prerequisite: course 123.

FRENCH

- *GABRIEL BONNO, Docteur ès Lettres, Professor of French.
FRANCIS J. CARMODY, Ph.D., Professor of French.
JACQUELINE DE LA HARPE, Docteur ès Lettres (Lausanne), Professor of French.
PERCIVAL B. FAY, Ph.D., Professor of French.
ARNOLD H. ROWBOTHAM, Ph.D., Professor of French (Chairman of the Department).

* Absent on leave, 1949-1950.

MATHURIN DONDO, Ph.D., Associate Professor of French, Emeritus.
 CLIFFORD H. BISSELL, Ph.D., Associate Professor of French.
 CLARENCE D. BRENNER, Ph.D., Associate Professor of French.
 *EDWARD F. MEYLAN, Ph.D., Associate Professor of French.
 RONALD N. WALPOLE, Ph.D., Associate Professor of French.
 ALVIN EUSTIS, Ph.D., Assistant Professor of French.
 IRVING PUTTER, M.A., Instructor in French.
 MARIE-LOUISE DUFRENOY, Ph.D., Associate in French.
 ALICE HABIS-REUTINGER, Ed.D., Associate in French.
 LAWRENCE ROMANI, M.A., Associate in French.



MURRAY SACHS, M.A., Lecturer in French.

Letters and Science List.—All undergraduate courses in French are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. Rowbotham, Mr. Brenner.

Preparation for the Major.—Required: courses 1, 2, 3, 4, 25, or their equivalents. (Students who receive grade A or B in French 4 will be admitted to the upper division courses without the requirement of course 25.) History 4A-4B, Philosophy 20A-20B, English 1A-1B, and Latin are strongly recommended.

The Major.—Required: courses 101A-101B, 109A-109B, and either 112A-112B, 120A-120B, or 121A-121B.

Any of the remaining upper division courses may be counted for the major with the exception of 122A-122B, 123A-123B; however, with the permission of the department, 4 units of the 24 may be satisfied by the courses named or by appropriate upper division courses in the following departments: Classics, English, German, History, Italian, Philosophy, or Spanish. Students who fail to maintain an average of one grade point for each unit of work undertaken in the upper division courses in the Department of French will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in French.

Honors.—To be recommended for honors at graduation, students must have completed with distinction the courses included in the major.

LOWER DIVISION COURSES

In courses 1, 2, 3, 4, three hours of basic study will be supplemented by two hours of specialized practical work, devoted to reading in some sections, and to conversation in other sections. The work in course 12 will be divided similarly.

1. Elementary French. Beginners' Course. (4) I and II.
 Sections meet five hours weekly. Mr. Putter in charge
12. Elementary French. Intensive Course. (8) I and II.
Miss Habis-Reutinger in charge
 Sections meet for two hours, five days a week.
2. Elementary French (continuation of 1). (4) I and II.
 Sections meet five hours weekly. Miss Habis-Reutinger in charge
 Prerequisite: two years of high school French or course 1.
3. Intermediate French. (4) I and II. Mr. Eustis in charge
 Sections meet five hours weekly.
 Prerequisite: three years of high school French or course 2 or course 12.
 Students who have hitherto specialized in reading will ordinarily be allowed to transfer to conversation sections of course 3 only if they have received a grade of A or B in course 2 or course 12.

* Absent on leave, 1949-1950.

4. Intermediate French. Composition and Conversation. (4) I and II.
Sections meet five hours weekly. Miss Dufrenoy in charge
Prerequisite: four years of high school French or course 3 (conversa-
tion).
- 4R. Intermediate French. Reading. (4) I and II. Mr. Brenner in charge
(Formerly numbered 8).
Reading and translation.
Prerequisite: course 3 (reading) or four years of high school French.
Not recommended for students who wish to take course 25 or upper division
work.
25. Advanced French. (3) I and II. Mr. Bissell in charge
Prerequisite: course 4, or course 4R with grade A or B.
- 1G. French for Graduate Students. No credit. I and II. Mr. Sachs in charge
Preparation for the graduate reading examinations.

UPPER DIVISION COURSES

The prerequisite to all upper division courses is 16 units of lower division courses, including course 4 with grade A or B, or course 25.

Courses 101A-101B and 109A-109B must usually be taken before any other upper division course, with the exception of course 125.

- 101A-101B. Intensive Reading, Grammar, and Composition. (3-3) Yr.
Beginning each semester. Mr. Eustis in charge
- 109A-109B. A Survey of French Literature from the Middle Ages to the Present. (3-3) Yr.
Miss de La Harpe
- 112A-112B. The Nineteenth Century. (2-2) Yr. Miss de La Harpe
- 114A-114B. Contemporary French Literature. (2-2) Yr. ———
- 115A-115B. Modern French Drama. (2-2) Yr. Mr. Brenner
- 116A-116B. French Literature from 1885 to 1914. (2-2) Yr. Mr. Carmody
- 120A-120B. The Seventeenth Century. (2-2) Yr. Mr. Fay
- 121A-121B. The Eighteenth Century. (2-2) Yr. Mr. Rowbotham
- *125. The Pronunciation of French. (1) I. Mr. Meylan
Course 125 is required of all candidates for the Certificate of Completion in French. Normally to be taken in the junior year. Enrollment limited to fifteen students.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. Bissell
Prerequisite: course 101A-101B.
Required of all candidates for the Certificate of Completion of the teacher-training curriculum.
- 131A-131B. Advanced Literary Composition. (3-3) Yr. Mr. Bissell
Prerequisite: course 101A-101B.
Required of all candidates for the M.A. degree.
A course in the development of an ability to write good literary French.
- 134A-134B. Survey of French Culture and Institutions. (2-2) Yr.
Miss Habis-Reutinger
Required of all candidates for the Certificate of Completion in French.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Miss de La Harpe in charge)

* Not to be given, 1949-1950.

COURSES IN WHICH NO KNOWLEDGE OF FRENCH IS REQUIRED

39. French Literature in English Translation.
(Formerly numbered 9.)
Lectures (in English) and collateral reading of representative works
in English translation.
- 39A. To the End of the Eighteenth Century. (2) I.
No prerequisite. Mr. Rowbotham, Mr. Eustis, Mr. Putter
- 39B. The Nineteenth Century. (2) II. Mr. Eustis, Mr. Putter
No prerequisite.
- 39C. The Contemporary Period. (2) I. Mr. Carmody
Prerequisite: course 39B or special permission of the instructor.
- 122A-*122B. Readings in French Literature of the Middle Ages. (2-2) Yr.
Mr. Walpole
- *123A-123B. Renaissance and Reformation in French Literature. (2-2) Yr.
Mr. Meylan

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Course 201A or 206A is required of all candidates for the M.A. degree.

- 201A-201B. Historical Grammar. (3-3) Yr. Mr. Carmody
- 202A-*202B. Studies in Mediaeval French Literature. (2-2) Yr.
Reading knowledge of Old French required. Mr. Walpole
- *204A-204B. Studies in the French Eighteenth Century. (2-2) Yr.
204A. Voltaire and the Philosophers. Mr. Rowbotham
204B. Jean-Jacques Rousseau.
Courses 204A-204B, 207A-207B, 210A-210B will be offered in rotation,
one each year.
- 206A-206B. Reading and Interpretation of Typical Old French Texts.
(2-2) Yr. Mr. Fay
- 207A-207B. Studies in the Eighteenth-Century Novel. (2-2) Yr.
Mr. Rowbotham
- *210A-210B. Studies in the Eighteenth-Century Drama. (2-2) Yr.
Mr. Brenner
- *214A-214B. French Versification. (2-2) Yr. _____
- *217. Studies in the French Renaissance. (2) II. Mr. Meylan
- *218A-218B. French Classicism. (2-2) Yr. Mr. Bonno
- *219A-219B. Aspects of French Romanticism. (2-2) Yr. _____
- 220A-220B. Explication de Textes. (2-2) Yr. Miss de La Harpe
235. Methods of Literary Research with Special Reference to Bibliography.
(1) II. Mr. Brenner
For prospective doctoral candidates.
298. Special Study for Graduate Students. (1-4) I and II.
The Staff (Mr. Brenner in charge)

GEOGRAPHY

- ¹ JOHN B. LEIGHLY, Ph.D., Professor of Geography.
CARL O. SAUER, Ph.D., Professor of Geography (Chairman of the Department).

* Not to be given, 1949-1950.

¹ In residence fall semester only, 1949-1950.

JOHN E. KESSELI, Ph.D., Associate Professor of Geography.
 JAMES J. PARSONS, Ph.D., Instructor in Geography.



- * ALFRED H. DEVRIES, Lecturer in Map History.
 WALTER R. HACKER, Ph.D., Lecturer in Geography for the spring semester.
 NICHOLAS T. MIROV, Ph.D., Lecturer in Geography.
 ERHARD ROSTLUND, M.A., Lecturer in Geography.
 WILLIAM J. TALBOT, M.A., (Professor of Geography, University of Capetown), Visiting Professor of Geography for the fall semester.

Letters and Science List.—All undergraduate courses in geography are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Kesseli.

Preparation for the Major.—Required: courses 1, 2, and 4. Recommended: Botany 12, Geology 1, 3, and a course in elementary statistics.

The Major.—24 units of upper division work in geography or from 18 to 21 units of upper division work in geography and from 3 to 6 units chosen under an approved plan from the following: Anthropology 118A–118B; Botany 151; Economics 110, 113, 188A; Forestry 103, 125; Genetics 100; History 161A–161B; Social Institutions 121, 122; Soil Science 101, 105.

Each program should normally include courses 101 or 102, 105A, 121, and 151.

LOWER DIVISION COURSES

1. Introduction to Geography: Physical Elements. (3) I and II.
Two lectures and two section meetings weekly. Mr. Rostlund
2. Introduction to Geography: Natural and Cultural Regions. (3) II.
Two lectures and two section meetings weekly. Mr. Rostlund
4. Map Reading and Map Interpretation. (3) I.
One lecture and two two-hour laboratory periods weekly. Mr. Kesseli
- 5A–5B. Economic Geography. (3–3) Yr. Mr. Parsons
Two lectures and two section meetings weekly.
The distribution of the world's resources and industries.
5A. Agricultural production in its regional differentiation.
5B. Mineral resources, manufacturing regions, trade routes, and trade centers.
Either half of the course may be taken independently.

UPPER DIVISION COURSES

101. Field Geography. (3) I. Mr. Kesseli
Field trips Saturdays.
Field study of a unit area with systematic mapping of the elements that constitute the natural region and of the forms of its utilization. Admission only after consultation with the instructor.
102. Field Geography. (3) II. Mr. Parsons
Field trips Saturdays.
Study of type areas of physical and cultural interest. Admission only after consultation with the instructor.
- 105A–*105B. Cartography. (3–3) Yr. Mr. Leighly
One lecture hour and two three-hour laboratory periods a week.
105A: Map Projections. 105B: Map Content.
The consent of the instructor must be obtained before enrollment.

* Not to be given, 1949–1950.

* In residence spring semester only, 1949–1950.

107. Map History and Map Appreciation. (1) II. Mr. deVries
108. Analysis of Land Forms. (3) I. Mr. Kesseli
Origin of land forms. Review of the varied interpretation of processes involved, with emphasis on recent views.
109. Topographical Photo Interpretation. (3) II. Mr. Kesseli
One lecture hour and two two-hour laboratory periods a week.
The identification and classification of data on air photographs; the solution of selected problems in photogrammetry. Admission only after consultation with the instructor.
111. Elementary Meteorology. (3) I. Mr. Leighly
Prerequisite: a knowledge of elementary physics and calculus is desirable.
113. Climatology. (3) II. _____
Prerequisite: course 111 or consent of the instructor.
121. Geography of North America. (3) I. Mr. Rostlund
- 122A. Geography of Middle America. (3) I. Mr. Sauer
- 122B. Geography of South America. (3) II. Mr. Sauer
- 123A. Geography of Mediterranean Europe. (3) I. Mr. Rostlund
- 123B. Geography of Northern Europe. (3) II. Mr. Rostlund
124. Geography of the Soviet Union. (3) I. Mr. Mirov
- 125A. Geography of India and Malaysia. (3) I. Mr. Parsons
- 125B. Geography of China and Japan. (3) II. Mr. Hacker
127. Geography of Southern Africa. (3) I. Mr. Talbot
Physical and cultural geography of Africa south of the northern boundaries of British East Africa and the Belgian Congo. Distribution and cultures of native peoples; geographical factors affecting the course of European settlement and the subsequent development and exploitation of mineral and other resources; problems arising from the impact of European, Asiatic, and native peoples and economies.
129. Geography of North and West Africa. (3) I. Mr. Talbot
Physical and human geography west and north of the northern boundaries of the Belgian Congo and British East Africa, with special reference to the development of indigenous cultures, colonial partition by European powers, and economic development and exploitation of natural resources in recent years.
131. Geography of California. (3) II. Mr. Kesseli
141. Economic Geography: Primary Production. (3) I. Mr. Parsons
Analysis of the distribution of agricultural and mineral raw materials in relation to world commerce.
142. Economic Geography: Industrial Localization. (3) II. Mr. Parsons
Factors and trends in the geographic distribution of manufacturing industries.
- *143. Political Geography. (3) II. _____
Discussion of the literature and the basic principles of political geography, followed by an analysis of geographic factors influencing the power relations of states: location, size, form, boundaries; human and material resources.
151. Principles of Geography. (2) I. Mr. Leighly
Prerequisite: three upper division courses in geography.
Reports and conferences on the objectives, subdivisions, and methods of geography, with special reference to different schools of geographic thought as expressed in recent literature.

153. Natural Resources and Their Exploitation. (3) II. Mr. Sauer
 Conservative and destructive uses of habitat (occupied area) by cultures (economic systems) throughout human time, with emphasis on contemporary problems.
161. Geography of Domesticated Plants and Animals. (3) I. Mr. Sauer
 A consideration of the processes, times, and places of appropriation of elements of flora and fauna into agricultural economics and of the successive geographic dispersal of the domesticated forms.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The Staff (Mr. Kesseli, Mr. Sauer in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

For facilities for research see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

201. Seminar in Latin-American Geography. (2) I. Mr. Sauer
202. Seminar in Historical Geography. (2) I. Mr. Talbot
 Topic: Development of earth knowledge.
203. Seminar in Cultural Geography. (2) II. Mr. Sauer
205. Seminar in Physical Geography. (2) II. Mr. Kesseli
 Topic: Analysis of land forms.
- *206. Seminar in Physical Geography. (2) II. _____
207. Seminar in History of Geography. (2) II. _____
- 219A-219B. Research (2-2) Yr.
 The Staff (Mr. Sauer, Mr. Kesseli in charge)

GEOLOGICAL SCIENCES

PERRY BYERLY, Ph.D., Professor of Seismology (Chairman of the Department).

CARLTON D. HULIN, Ph.D., Professor of Geology.

ADOLF PABST, Ph.D., Professor of Mineralogy.

NICHOLAS L. TALIAFERRO, Ph.D., Professor of Geology.

FRANCIS J. TURNER, Sc.D., Professor of Geology.

†HOWEL WILLIAMS, Sc.D., Professor of Geology.

ANDREW C. LAWSON, Ph.D., Sc.D., LL.D., Professor of Geology and Mineralogy, Emeritus.

GEORGE D. LOUDERBACK, Ph.D., LL.D., Professor of Geology, Emeritus.

CHARLES M. GILBERT, Ph.D., Associate Professor of Geology.

NORMAN E. A. HINDS, Ph.D., Associate Professor of Geology.

JEAN VERHOOGEN, M.E., Ph.D., Associate Professor of Geology.

WILLIAM H. MATHEWS, Ph.D., Assistant Professor of Geology.



BURDETTE A. OGLE, M.A., Lecturer in Geology.

Letters and Science List.—All undergraduate courses in geological sciences except course 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Gilbert.

* Not to be given, 1949-1950.

† Absent on leave, 1949-1950.

Preparation for the Major.—Required: Chemistry 1A–1B; Physics 2A–2B; Engineering 1A–1B; Geology 1, 3; Mineralogy 4A–4B; Mathematics 3A–3B. Paleontology 1 may be substituted for Geology 3 with the consent of the major adviser. It is recommended that prospective major students take Mathematics 4A–4B, and Physics 3A–3B. Mineralogy 4A–4B must be completed within the lower division; this involves completion of the prerequisites Chemistry 1A–1B and Physics 2A–2B by the close of the freshman year. Students intending to take upper division courses in geophysics must complete Mathematics 3A–3B within the lower division. Engineering 1A–1B may be postponed to the upper division.

Recommended: For students going into petrological, mineralogical, or economic undertakings, Chemistry 5 is desirable.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses of the major program. Students who cannot maintain such an average may be required at any time to withdraw from the departmental major.

The Major.—All major programs must include Geology 102A–102B (4), 103 (4) and 118L (4) or 118 (6) or 112A–112B (4). The department will certify to the completion of a major program for graduation only on the basis of at least C grades in Geology 102A–102B and 103. Credits for courses completed in other departments or institutions will not be accepted as equivalent to Geology 102A–102B or 103, except on satisfactory completion of appropriate tests. In addition, at least 12 units chosen from one of the following groups must be included:

I. Emphasis on petrology: Geology 104A–104B (6), Chemistry 109 (3), and two of the following courses: Geology 116, 110A, 110B, 214A, 214B, Mineralogy 103.

II. Emphasis on mining geology: Geology 104A–104B (6), 106 (3), 109 (3) and 114 (3), and one of the following: Geology 116 (2), Mineralogy 103 (3).

III. Emphasis on petroleum geology: Geology 104A–104B (6), 108 (2), and Paleontology 111 (4) and 112 (4). Recommended: Geology 110A–110B (5), 116 (2), 122A–122B (4); Paleontology 102 (3) and 114 (4). Students selecting this emphasis should take Paleontology 1 during the first two years.

IV. Emphasis on historical and stratigraphic geology: Geology 107 (2), 116 (2), Paleontology 102 (3), 111 (4), 112 (4). Recommended: Paleontology 114 (4); Geology 104A, 104B, 209A, 209B.

V. Emphasis on geophysics: Geology 120A–120B (4), 121 (4), 116 (2), 104A (3), 122A–122B (4), and one of the following: Geology 104B, 107, Mathematics 119A, Physics 105A.

GEOPHYSICS

Departmental Major Adviser: Mr. Verhoogen.

Preparation for the Major.—Required: Chemistry 1A–1B; Geology 1, 3; Mathematics 3A–3B, 4A–4B; Mineralogy 4A; Physics 4A–4B–4C.

The Major.—Required: Electrical Engineering 106; Geology 102A–102B, 103, 121, 122A–122B; Mathematics 110A–110B; Physics 105A–105B, 110A–110B.

GEOLOGY

LOWER DIVISION COURSES

1. General Geology: Dynamical and Structural. (3) I.

(Formerly numbered 1A.)

Mr. Hinds, Mr. Verhoogen

Three lectures and one demonstration and discussion section weekly.

Prerequisite: elementary chemistry.

Not open to students who have taken Geology 2.

A survey of the nature and structure of the materials composing the earth and of the processes that shape the earth's surface.

2. General Geology: Physical. (3) II. Mr. Hinds
 Three lectures and one section meeting weekly.
 Not open to students who have taken or are taking Geology 1.
 The earth's surface features and the geologic laws governing their origin and development. Principles underlying the evolution of topography under different climatic conditions.
3. General Geology: Historical. (3) II. Mr. Hinds
 (Formerly numbered 1B.)
 Three lectures and one demonstration and discussion section weekly.
 Prerequisite: Geology 1 or 2.
 Origin and geological history of the earth and the evolution of its animal and plant inhabitants.

UPPER DIVISION COURSES

- 102A-102B. Field Geology. (2-2) Yr.
 Mr. Gilbert, Mr. Mathews, Mr. Ogle, Mr. Taliaferro
 One lecture a week and field trips all day Saturday.
 Prerequisite: Geology 103, which may be taken concurrently.
 Training in the methods of field observation and mapping and in the interpretation of results.
- 102A. Inquiry into the geology of the Berkeley hills. At least eight days in the field.
- 102B. Inquiry into the geology of other areas adjacent to the Bay of San Francisco and in the Sierra Nevada. At least ten days in the field.
 Reports will be prepared on the results of field work.
 Concurrently with the field work, the class meets for lectures, exercises on topographic and geologic maps, and for discussion of methods.
103. Introduction to Petrology. (3-4) I.
 Mr. Taliaferro, Mr. Hulin, Mr. Ogle
 Two lectures and one or two three-hour laboratory periods weekly.
 Students in metallurgy, mining, and petroleum engineering will be required to take one afternoon of laboratory work for 3 units of credit. Geology majors and students in the mineral exploration curriculum of the College of Engineering will take two afternoons of laboratory work for 4 units of credit.
 Prerequisite: Geology 1, Mineralogy 4A.
 Characteristics, origin, mode of occurrence, and nomenclature of rocks, and description of the more common types. Laboratory practice in determination of textures, mineral components, and systematic position of rocks by observation of hand specimens.
- 104A-104B. Microscopic Petrography Laboratory. (3-3) Yr.
 Mr. Mathews, Mr. Turner
 Lecture and two three-hour laboratory periods weekly.
 Prerequisite: Mineralogy 4A, and for Geology 104B, Geology 103.
 The optical properties of crystals, followed by determination of minerals and then of rocks by means of the microscope. Approximately one-third of the year is devoted to each of these three topics.
106. Economic Geology, Metalliferous Deposits. (3) I. Mr. Hulin
 Three lectures weekly and occasional conference hours.
 Prerequisite: Geology 103, which may be taken concurrently.
107. Geology of North America. (2) II. Mr. Hinds
 Two lectures a week and occasional conference hours.
 Prerequisite: Geology 3, 102A, and 103.
108. Economic Geology, Nonmetalliferous Deposits. (2) II. Mr. Verhoogen
 Special emphasis is placed on petroleum.
 Prerequisite: Geology 1 and Mineralogy 4A.

109. Microscopy of the Metallic Ores. (3) II. Mr. Hulin
 One lecture and two three-hour laboratory periods weekly.
 Prerequisite: Geology 106.
 Introduction to the study of polished surfaces of the metallic ores. Methods of preparation; properties and identification; ore textures; alteration products and associated gangue minerals.
- 110A-110B. Advanced Sedimentary Petrography. (3-2) Yr. Mr. Gilbert
 One lecture and two three-hour laboratory periods weekly in 110A; laboratory only in 110B.
 Prerequisite: Geology 104A.
 110A. Mechanical and mineralogical analysis of sediments and sedimentary rocks. Determination of refractive indices and orientation of mineral grains.
 110B. Study of sedimentary rocks in thin section; identification of mineral grains.
- 112A-112B. Undergraduate Thesis Course. (2-2) Yr. Beginning each semester. The Staff (Mr. Turner in charge)
 Introduction to independent research; investigation of a problem individually chosen, with a formal report on the results. Admission to the course, hours, and subject matter must be individually arranged with the instructor under whom the student chooses to work.
114. Methods in Mining Geology. (3) II. Mr. Hulin
 Three lectures weekly and an occasional conference hour. One or more field excursions.
 Prerequisite: Geology 106.
 A consideration of the more practical aspects of geology as applied to mining; methods of underground mapping; interpretation of ore structures, wall-rock alteration, and secondary enrichment; leached outcrop technique.
116. Structural Geology. (2) II. Mr. Taliaferro
 Prerequisite: Geology 1, 102A-102B.
 Deformation of the earth's crust; mountain growth; folding and faulting and their economic aspects; graphic solution of fault problems.
117. Geomorphology. (3) I. Mr. Hinds
 Two lectures a week and one additional conference hour.
 Students who have not completed Geology 102A-102B or who are not taking it concurrently will be admitted only by special permission of the instructor.
 Nature, evolution, and classification of land forms; use of physiographic methods in elucidating the later geologic history of various regions and in interpreting conditions of the geologic past.
- 118, 118L. Advanced Summer Field Course. Mr. Taliaferro
 Prerequisite: Geology 102A-102B.
 The aim of the course is to develop: (1) facility and accuracy in geological mapping; (2) ability to observe and interpret rocks, structures and physiographic features, and other geological phenomena; and (3) the capacity to execute independently a geological survey and prepare a suitable report. Satisfactory completion of this course satisfies the undergraduate thesis requirements for students whose major is geology.
 This work may be taken for credit during two or more summers; however, not more than 6 units of credit so gained will be accepted as part of the undergraduate major. 118 is a six weeks' course for which 4 units will be assigned. 118L is an eight weeks' course for which 6 units will be assigned.

- 120A-120B. Elementary Geophysics. (2-2) Yr. Mr. Byerly, Mr. Verhoogen
 120A: Mr. Byerly; 120B: Mr. Verhoogen.
 Prerequisite: Physics 2A-2B, Mathematics 3A-3B, Geology 1.
 Students who are taking or have taken Geology 121 and 122A-122B may not receive credit for this course.
 120A: Seismology. (Formerly numbered 120.)
 120B: Gravitational, magnetic, and electrical properties of rocks.
121. Practical Seismometry. (4) II. Mr. Byerly.
 Three lectures and one three-hour laboratory period weekly.
 Prerequisite: Physics 2A-2B, Mathematics 4A-4B.
 Paths of seismic waves and their relation to the structure of the earth, with emphasis on problems of seismic prospecting; elementary theory of the seismograph; laboratory analysis of seismograms and interpretation of travel-time curves in terms of structure.
- 122A-122B. Principles of Geophysics. (2-2) Yr. Mr. Verhoogen
 Two lectures weekly, and occasional conference hours.
 Prerequisite: Geology 1, Mathematics 4A-4B, and Physics 2A-2B or equivalent.
 122A. General geophysics.
 122B. Applications to geologic problems.
199. Special Study for Advanced Undergraduates. (1-4) I and II.
 The Staff (Mr. Turner in charge)
 For properly qualified senior students who wish to undertake selected readings or research under the guidance of a member of the department.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

204. The Theory of Waves in an Elastic Medium. (2) I. Mr. Byerly
 The theory of stress and strain, of equilibrium and wave motion in elastic solids, with special application to earthquake waves.
206. Seminar in Geology of Metalliferous Deposits. (2) I. Mr. Hulin
 Prerequisite: Geology 106.
- *207A. Seminar in Volcanology. (2) I. Mr. Verhoogen
 The origin and nature of volcanic processes; principal types of activity as exemplified by modern volcanoes; characters and classification of lavas and pyroclastic rocks.
- 207B. Seminar in Geophysics. (2) II. Mr. Verhoogen
 Fundamental problems of earth structure, thermal history, and magmatic intrusion.
- 209A-209B. Geology of California. (2-2) Yr. Mr. Taliaferro
 Prerequisite: Geology 102A-102B, 103, and a course in historical geology, such as course 3 or 107.
 Critical study of literature, with discussion of evidence and scientific method; the main reported facts and theories of the history of sedimentation, volcanism, the major earth movements, and geographical changes in California and bordering areas covered in reports, discussions, and occasional lectures.
213. Seminar in Geomorphology. (2) I. Mr. Hinds
 Prerequisite: Geology 117 or its equivalent.
 The topics to be considered will vary from year to year.

* Not to be given, 1949-1950.

- 214A-214B. Advanced Petrographic Laboratory. (2-5; 2-5) Yr. Mr. Turner
Laboratory periods and occasional conferences, by arrangement.
Instruction in the use of the universal stage will be given to selected students.
Prerequisite: Geology 104A-104B. Recommended: Mineralogy 105.
Metamorphic and igneous rocks in alternate years. 1949-1950, metamorphic rocks.
- 215A-215B. Seminar in Sedimentation. (2-2) Yr. Mr. Gilbert, Mr. Turner
215A: Mr. Turner; 215B: Mr. Gilbert.
Prerequisite: Geology 104A-104B.
216. Seminar in Structural Geology. (2) II. Mr. Taliaferro
Prerequisite: Geology 102A-102B, 103, 116, and a course in historical geology.
Folding and faulting, growth of mountains: a study of special topics in structural geology. Reports and discussions, with occasional lectures.
217. Advanced Seismometry. (2) II. Mr. Byerly
The general mathematical theory of the seismograph; discussion of the problems of modern seismometry and of recent results.
- 218A-218B. Seminar in Seismology. (2-2) Yr. Mr. Byerly
Critical study of original literature relating to seismological problems. The content will vary from year to year.
220. Research. (1-5) I and II.
The Staff (Mr. Taliaferro, Mr. Turner in charge)

MINERALOGY

LOWER DIVISION COURSES

- 4A. Elementary Mineralogy. (3) I. Mr. Pabst
One lecture and two three-hour laboratory periods weekly.
Prerequisite: Chemistry 1A and Physics 2A-2B.
Lectures on the physical properties of minerals and crystal morphology.
Practice in determination of minerals by simple physical tests.
- 4B. Elementary Mineralogy. (2) II. Mr. Pabst, Mr. Ogle
Two three-hour laboratory periods weekly.
Prerequisite: Mineralogy 4A and Chemistry 1B.
Practice in determination of minerals by physical properties and simple chemical tests.

UPPER DIVISION COURSES

103. Descriptive Mineralogy. (3) II. Mr. Pabst
Prerequisite: Mineralogy 4A.
Lectures on the principal groups of minerals, emphasizing isomorphous series, chemical variation, and structure; problems in determination of mineral formulas from analyses.
- *105. Paragenesis of Minerals. (3) I. Mr. Pabst
Prerequisite: Mineralogy 103.
To be given in alternate years.
107. Crystallography. (3) I. Mr. Pabst
Prerequisite: Mathematics 3A-3B and consent of the instructor.
Lectures on the principles of crystallography and crystal structure, with brief reference to some of the methods of crystal structure analysis and the relation of the properties of crystals to their structure and classification.

* Not to be given, 1949-1950.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)
Research. (See Geology 220.)

282. Problems in Crystallography. (1-2) I and II.

Mr. Pabst

Prerequisite: consent of the instructor.

GERMAN

CLAIR HAYDEN BELL, Ph.D., Professor of German.

¹ EDWARD V. BREWER, M.A., Professor of German (Chairman of the Department, fall semester).

ARTHUR G. BRODEUR, Ph.D., Professor of Germanic Philology and English.

LAWRENCE M. PRICE, Ph.D., Professor of German.

* ARCHER TAYLOR, Ph.D., Professor of German.

CLARENCE PASCHALL, M.A., Professor of German, Emeritus.

ALICE P. TABOR, Ph.D., Assistant Professor of German, Emeritus.

ERWIN G. GUDDE, Ph.D., Associate Professor of German.

EDMUND KURT HELLER, Ph.D., Associate Professor of German.

C. GRANT LOOMIS, Ph.D., Associate Professor of German.

PHILIP MOTLEY PALMER, Ph.D., Associate Professor of German.

FRANZ SCHNEIDER, Ph.D., Associate Professor of German.

HANS M. WOLFF, J.D., Ph.D., Associate Professor of German.

* MADISON S. BEELER, Ph.D., Assistant Professor of German.

MARIANNE BONWIT, Ph.D., Assistant Professor of German.

ANDREW O. JÁSZI, Ph.D., Assistant Professor of German.

O. PAUL STRAUBINGER, Ph.D., Assistant Professor of German.

EDITH J. LEWY, Associate in German.

HANNA M. LÖHNBERG, Ph.D., Associate in German.



KARL VIĚTOB, Ph.D. (Professor of German, Harvard University), Visiting Professor of German for the spring semester.

Letters and Science List.—All undergraduate courses in German are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Miss Bonwit.

Preparation for the Major.—German 1, 2, 3, 4, or their equivalents, completed satisfactorily.

The Major.—Requirement: 24 units in upper division courses, including one full year's course in composition and at least 6 units made up from the senior courses 114, 118A, 118B, and 135. Six of the 24 units may be related work in other departments. Attention is also directed to the courses listed under "Foreign Literature in English Translation," page 304. Students looking forward to the secondary credential should include courses 118A-118B, 131A-131B, 135, and 140.

Honors.—To be recommended for honors at graduation, students must have completed with distinction the courses outlined for the major, including courses 118A, 118B.

Higher Degrees.—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

* Absent on leave, 1949-1950.

¹ In residence fall semester only, 1949-1950.

LOWER DIVISION COURSES

1. Elementary German. Beginners' Course. (4) I and II.
Mr. Palmer in charge
12. Elementary German. Intensive Course. (8) I and II. Mr. Gudde
Two hours daily, four times a week.
This course stresses the oral-aural approach, and is equivalent to courses 1 and 2.
2. Elementary German (continuation of 1). (4) I and II.
Mr. Palmer in charge
Prerequisite: course 1 or two years of high school German.
3. Intermediate German. (4) I and II. Mr. Jászi in charge
Prerequisite: course 2 or three years of high school German.
- 3C. German Conversation. (1) I and II. Mr. Schneider in charge
Open to students who are taking course 3 concurrently.
4. Intermediate German. (4) I and II. Mr. Jászi in charge
Prerequisite: course 3 or four years of high school German.
- 4C. German Conversation. (1) I and II. Mr. Schneider in charge
Open to students who are taking course 4 concurrently.
- 1G. German for Graduate Students. No credit. I and II.
Mr. Straubinger in charge
A course designed to prepare students for the graduate reading examinations. Sections will be offered in the humanities, biological sciences, physical sciences and social sciences.
- 3S. Scientific German. (3) I and II. Mr. Straubinger in charge
Prerequisite: course 2 or equivalent. Open only to students in the colleges of Chemistry and Engineering, premedical and pre dental students, and students in the College of Letters and Science who are majoring or preparing for a major in one of the scientific departments.
- 4S. Scientific German. (3) I and II. Mr. Straubinger
Prerequisite: course 3S or 3 or equivalent.
4S may be repeated without duplication of credit.
- 4M. Medical German. (3) I and II. Mr. Heller
(Formerly numbered 3M.)
Prerequisite: course 3 or 3S or equivalent.
39. Great Writers in German Literature.
(Formerly numbered 9.)
Any one of these courses is open to students in all departments of the University, major students in German excepted. No knowledge of German required.
- *39A. Medieval Period. (1) I, Mr. Taylor.
39B. Eighteenth Century. (1) II, Miss Bonwit.
39C. Nineteenth Century. (1) I, Mr. Schneider.
39D. Twentieth Century. (1) II, Mr. Loomis.

UPPER DIVISION COURSES

- Prerequisite: 16 units of lower division courses.
100. Introduction to Modern German Literature. (3) I and II.
Mr. Loomis, Mr. Gudde
104. Dramas of the Nineteenth Century. (3) I and II.
Mr. Straubinger, Mr. Wolff
106. Schiller's Dramas. (3) I.
Mr. Brewer

* Not to be given, 1949-1950.

- *107. Schiller's Poetry, Aesthetic and Historical Writings. (3) II.
Mr. Brewer
- *108. Introduction to Goethe. (3) I.
Götz von Berlichingen, Urfaust, Werther.
Mr. Wolff
- *109. Goethe's Verse Dramas; *Tasso, Iphigenie, Faust*, Part I. (3) II.
Mr. Price
110. The German Ballad and Lyric Poetry except Goethe. (1) I.
Mr. Schneider
111. Goethe's Poems. (1) II.
Mr. Schneider
112. Survey of German Culture and Institutions. (3) II. Mr. Gudde
Open to all upper division students who have a reading knowledge of German, and recommended for prospective teachers.
114. German Literature of the Nineteenth Century. (3) I. Mr. Schneider
Prerequisite: 6 units from any of the above-listed upper division courses.
- 116V. German Classicism (Goethe, Schiller, Herder, W. von Humboldt, and Hölderlin). (3) II. Mr. Viëtor
Prerequisite: same as for course 114.
Lectures in German, interpretations, collateral reading, and reports.
- 118A. History of German Literature in the Middle Ages. (3) I. Mr. Heller
Prerequisite: same as for course 114.
- 118B. History of German Literature from the Reformation to the Romantic Movement. (3) II. Mr. Price
Prerequisite: same as for course 114. Course 118A is not prerequisite to 118B.
124. German Poetry of the Twentieth Century. (2) II. Mr. Jászi
Prerequisite: same as for course 114.
- *125. Introduction to Folklore. (3) II. Mr. Taylor
Prerequisite: senior standing (for major students in anthropology, junior standing) and the ability to read one foreign language.
A survey of the materials of popular tradition, the folk song, the folk tale, the proverb, the riddle, and other forms. The methods and results of investigation in this field will be presented.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. Palmer
- 131A-131B. Advanced Grammar and Composition. (2-2) Yr. Miss Bonwit
Prerequisite: grade C or above in course 130A-130B.
135. Middle High German. (3) II. Mr. Bell
Prerequisite: same as for course 114. This course should be taken with or after (but not before) course 118A.
Outlines of grammar; selections from the *Nibelungenlied* and the epics of chivalry.
140. The Pronunciation of German. (2) I. Mr. Palmer
Designed for prospective teachers and those planning to take linguistic courses.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Mr. Brewer in charge

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Prerequisite: for the literary courses, course 118A or 118B; for students in linguistics, courses 135 and 140 are strongly recommended. For advanced study in German literature and linguistics a reading knowledge of French is indis-

* Not to be given, 1949-1950.

pensable and a general acquaintance with German history strongly advised. For linguistic work some previous study of Latin and Greek is highly desirable.

- *200. Bibliography of German Literary History. (2) I. Mr. Taylor
An introduction to the bibliographical tools used by the student in the fields of German linguistics, the history of German literature, and folklore.
201. Germanic Heroic Poetry. (3) II. Mr. Brodeur
(Formerly given as English 207.)
203. Studies in Middle High German Literature. (2) I. Mr. Bell
Prerequisite: course 135.
In 1949-1950 the special topic: The German Minstrel Epic.
- *204. The Poetry of the Elder Edda. (3) II. Mr. Brodeur
Prerequisite: course 280.
Old Norse mythological and legendary poems read in the original.
- *205. German Literature During the Renaissance and Reformation. (3) II. Mr. Taylor
206. German Literature During the Seventeenth Century. (2) II. Mr. Loomis
- *214. Lessing and His Time. (3) I. Mr. Price
220. Studies in the Storm and Stress Movement. (2) I. Mr. Wolff
221. Goethe in Weimar to Schiller's Death. (2) II. Mr. Wolff
222. Goethe's *Faust*. (3) I. Mr. Price
- *228. Early German Romanticism: 1795-1810. (3) I. Mr. Brewer
- *229. Kleist, Büchner, Grabbe. (2) II. Mr. Wolff
238. German Realism, 1850-1900. (2) I. Miss Bonwit
- *242. *Das Junge Deutschland*. (2) I. Mr. Schneider
Special emphasis on Heine and Gutzkow.
- 244V. Stefan George and Rilke. (2) II. Mr. Viëtor
- *245. The Tale. (2) I. Mr. Taylor
298. Special Study for Graduate Students. (1-4) I and II. Mr. Brewer in charge
(Formerly numbered 250.)

Germanic Linguistics

For the courses in English Philology, see the Department of English, page 297.

- *260. Germanic Linguistics. (3) I. Mr. Beeler
Prerequisite: some acquaintance with at least two of the older Germanic languages.
Phonology, morphology, and lexicography of the Germanic languages; the relationship of the Germanic languages to one another; the reconstruction of Proto-Germanic; Indo-Germanic and Indo-European.
262. History of the German Language. (3) I. Mr. Palmer
- *265. Gothic. (3) II. Mr. Beeler
275. Old High German. (3) II. Mr. Palmer
- *280. Old Icelandic. (3) II. Mr. Beeler
290. Seminar in Germanic Linguistics. (2-3) II. Mr. Palmer
The subject will vary from year to year; the topic for 1949-1950 will be Early New High German.

* Not to be given, 1949-1950.

GREEK

For courses in the Greek language and literature, see under Department of Classics, page 236.

HISTORY

GEORGE H. GUTTRIDGE, M.A. (Cantab.), Professor of English History.

GEORGE P. HAMMOND, Ph.D., Professor of History.

² LAWRENCE A. HARPER, J.D., Ph.D., Professor of American History.

† JOHN D. HICKS, Ph.D., A. F. and May T. Morrison Professor of History (Chairman of the Department).

† ERNST H. KANTOROWICZ, Ph.D., Professor of History.

² ROBERT J. KEENER, Ph.D., LL.D., Litt.D., Sather Professor of History.

LAWRENCE KINNAIRD, Ph.D., Professor of History.

FRANKLIN C. PALM, Ph.D., Professor of Modern European History.

RAYMOND J. SONTAG, Ph.D., Sidney Hellman Ehrman Professor of European History.

JOHN J. VAN NOSTRAND, Ph.D., LL.D., Professor of Ancient History (Vice-Chairman of the Department).

DIXON WECTER, Ph.D., LL.D., Margaret Byrne Professor of United States History.

HERBERT E. BOLTON, Ph.D., Litt.D., L.H.D., LL.D., Sather Professor of History, Emeritus.

* WOODBRIDGE BINGHAM, Ph.D., Associate Professor of Far Eastern History.

JAMES F. KING, Ph.D., Associate Professor of History.

GEORGE V. LANTZEFF, Ph.D., Associate Professor of History.

PAUL B. SCHAEFFER, Ph.D., Associate Professor of European History.

ENGEL SLUITER, Ph.D., Associate Professor of History.

KENNETH M. STAMPP, Ph.D., Associate Professor of History.

¹ WALTON E. BEAN, Ph.D., Assistant Professor of History.

DELMER M. BROWN, Ph.D., Assistant Professor of History.

WILLIAM N. DAVIS, Ph.D., Assistant Professor of History.

GORDON GRIFFITHS, Ph.D., Assistant Professor of History.

CHARLES JELAVICH, Ph.D., Instructor in History.



F. HILARY CONROY, Ph.D., Lecturer in Far Eastern History.

EVELYN B. McCUNE, A.B., Lecturer in History.

ARMIN RAPPAPORT, Ph.D., Lecturer in History.

Introductory Courses.—Courses 4A–4B and 8A–8B are open to all students, but 4A should be taken preferably before 8A by freshmen; courses 17A–17B and 19A–19B are open to all students above the freshman year; the A part of any of the introductory courses should ordinarily precede the B part.

Foreign Language in the Lower Division.—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

Letters and Science List.—All undergraduate courses in history are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

† Sabbatical leave in residence, 1949–1950.

* Absent on leave, 1949–1950.

¹ In residence fall semester only, 1949–1950.

² In residence spring semester only, 1949–1950.

Departmental Major Advisers: Mr. Guttridge, Chairman; Mr. Bingham, Mr. King, Mr. Schaeffer.

Preparation for the Major.—Required: History 4A–4B; and 8A–8B or 17A–17B or 19A–19B (according to the intended field of concentration); and either Economics 1A or Geography 1.

The Major.—Students majoring in history must complete 24 upper division units in history, including:

- (a) *In the junior year:* History 101 and at least one year course of broad scope, preparatory to more specialized work in the same field (Europe, Western Hemisphere, Far East).
- (b) *In the junior or senior year:* a second year course in a different field from that chosen under (a) above.
- (c) *In the senior year:* some concentration in one of the fields already studied, to be determined in consultation with the adviser.
- (d) A year's work in the history of the United States, if this has not already been taken in the lower division.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in history.

Honor Students in the Upper Division.—Students who complete a major in history with distinction are eligible for recommendation for honors upon passing the comprehensive examination. Attention is directed to course 198 and to page 86.

Teacher-Training Curricula.—The curriculum for the Certificate of Completion (with a teaching major in social studies) differs from that of the undergraduate major in history both in the list of prescribed courses and in the requirement of at least 1.75 grade points per unit. For further information concerning the teacher-training curriculum, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, and consult the graduate adviser.

Higher Degrees.—Students planning to work toward the degrees of M.A. and Ph.D. should consult the ANNOUNCEMENT OF THE GRADUATE DIVISION and the ANNOUNCEMENT OF THE GRADUATE DIVISION IN THE SOCIAL SCIENCES, and confer with the graduate adviser.

LOWER DIVISION COURSES

In courses 4A–4B, 8A–8B, 17A–17B, and 19A–19B, weekly sections are organized to give supplementary instruction in historical geography, map work, bibliography, and methods of historical study

4A–4B. History of Western Europe. (3–3) Yr. Beginning each semester.

Mr. Kerner, Mr. Palm, Mr. Griffiths, Mr. Jelavich

Course 4A is prerequisite to 4B for freshmen.

8A–8B. History of the Americas. (3–3) Yr. Beginning each semester.

Mr. King, Mr. Sluiter

17A–17B. History of the United States. (3–3) Yr. Beginning each semester.

Mr. Bean, Mr. Davis, Mr. Harper, Mr. Rappaport, Mr. Stampf

Prerequisite: sophomore standing.

This course satisfies the American History and Institutions requirement.

19A–19B. History and Civilizations of Asia. (3–3) Yr.

Mr. Conroy

Prerequisite: sophomore standing.

UPPER DIVISION COURSES

101. Introduction to Historical Method and Bibliography. (3) I and II.

Two lectures a week and conference hours. Mr. Griffiths, Mr. Jelavich

Prescribed in the junior year for, and restricted to, students majoring

- in history. Two papers and a bibliography are prepared by each student; and the use of the library is emphasized. Enrollment is limited.
- 111A-111B. Ancient History. (3-3) Yr. Mr. Van Nostrand
 111A. Greek history to the Roman conquest.
 111B. Roman history to the fourth century A.D.
- *113. History of Ancient Mediterranean Colonization. (3) II.
 Mr. Van Nostrand
- *115. Byzantium: the Eastern Empire to 867. (3) I. Mr. Kantorowicz
- 121A-121B. Medieval History. (3-3) Yr. Mr. Schaeffer
 121A. 500 to 1100.
 121B. 1100 to 1500.
122. Medieval Culture. (3) I. Mr. Schaeffer
123. Medieval France. (3) II. Mr. Schaeffer
- *125A-125B. Medieval Thought and Institutions. (3-3) Yr.
 125A. Carolingian Europe (700-900). Mr. Kantorowicz
 125B. Empire and Papacy (900-1100).
- *130A-130B. The Thirteenth Century and the Renaissance, 1200-1500. (3-3)
 Yr. Mr. Kantorowicz
- 131A-131B. History of Europe in the Early Modern Period (1500-1789).
 (3-3) Yr. Mr. Griffiths
- *134A-134B. Western Europe: Its Cultural History since the French
 Revolution. (3-3) Yr. Mr. Sontag
- 135A-135B. History of Russia and Poland to the Crimean War. (3-3) Yr.
 Mr. Lantzeff
- *136A-136B. History of Russia and Poland since the Crimean War. (3-3)
 Yr. Mr. Kerner
 136A. Internal History of Russia and Poland with emphasis on Soviet
 Russia.
 136B. Russia and the Soviet Union in world politics and world eco-
 nomics.
- *137A-137B. History of Russian Civilization. (2-2) Yr. Mr. Lantzeff
- 138A-138B. History of Russian Central Asia, Siberia, and Alaska. (3-3) Yr.
 Mr. Lantzeff
- 139A-139B. History of Southeastern Europe and the Near East. (3-3) Yr.
 Mr. Jelavich
- *141. History of Modern France. (3) I. Mr. Palm
- *142A-142B. History of Modern Italy. (2-2) Yr. Mr. Griffiths
- 143A-143B. Modern Germany from the Eighteenth Century. (2-2) Yr.
 143A. Eighteenth and Nineteenth Centuries. Mr. Sontag
 143B. Twentieth Century.
- 144A-144B. European Diplomatic History. (3-3) Yr. Mr. Sontag
 144A. 1848 to 1914.
 144B. 1914 to the present.
145. The Revolutionary Era in Europe. (3) I. Mr. Palm
146. Europe since 1870. (3) II. Mr. Palm
- *148. Recent World History. (3). Mr. Kerner
 The historical background since the First World War and the current
 situation in world politics and world economics.
- *150. Medieval England. (3) I. Mr. Kantorowicz
- 151A-151B. History of England, from 1485 to the Present. (3-3) Yr.
 Mr. Guttridge

* Not to be given, 1949-1950.

- *152. Constitutional History of England to 1485. (3) II. Mr. Kantorowicz
Prerequisite: course 150 or 121A-121B.
154. England and the American Colonies to 1783. (2) I. Mr. Guttridge
Prerequisite: course 151A or equivalent.
- *155. The British Commonwealth and Empire since 1783. (2) Mr. Guttridge
Prerequisite: course 151B or equivalent.
- *157. Burke and His Age, 1750-1800. (2). Mr. Guttridge
Reading and discussion.
Prerequisite: course 151A-151B or equivalent.
- 160A-160B. History of Spain and Portugal. (3-3) Yr. Mr. Van Nostrand
- 161A-161B. Hispanic-American History. (3-3) Yr. Mr. Sluiter, Mr. King
161A. The Colonies: Mr. Sluiter.
161B. Since Independence: Mr. King.
162. History of the Caribbean Area. (2) I. Mr. King
163. History of Brazil. (3) II. Mr. Sluiter
- 166A-166B. History of Mexico. (2-2) Yr. Mr. Hammond
166A. Colonial Period.
166B. National Period.
- 167A-167B. History of the Foreign Relations of the United States. (3-3) Yr.
167A. 1776-1880. Mr. Rappaport
167B. 1880-1949.
- 172A*-172B. Constitutional History of the United States. (2-2) Yr.
Mr. Harper
Prerequisite: course 17A-17B or consent of the instructor.
- 172C*-172D. Constitutional History of the United States. (1-1) Yr.
Mr. Harper
A discussion group for students enrolled in 172A-172B, who wish to do additional work in the same field.
173. The Era of Sectional Conflict. Mr. Stampf
173A. The Old South. (3) I.
173B. The Era of the Civil War, 1850-1865. (3) II.
*173C. Reconstruction and the New Nation, 1865-1896. (3)
- 174A-174B. Recent History of the United States. (3-3) Yr.
174A. 1896-1920. Mr. Bean, Mr. Davis
174B. 1920-1949.
- 176A-176B. Social History of the United States. (3-3) Yr. Mr. Wecter
176A. 1750-1850.
176B. 1850-1949
- *177A-177B. History of the United States, 1787-1845. (3-3) Yr. Mr. Bean
Prerequisite: course 17A-17B. Course 177A is not prerequisite to 177B.
177A. The Constitution and the Early Union to 1815.
177B. The Jacksonian Era.
- 181A-181B. The History of North America. (3-3) Yr. Mr. Kinnaird
- *183. Economic Exploitation of Colonial America. (3) II. Mr. Sluiter
- 187A-*187B. The West in United States History. (2-2) Yr. Mr. Davis
Prerequisite: course 17A-17B.
- 189A-189B. History of California. (2-2) Yr. Mr. Kinnaird
189A. Spanish and Mexican Period.
189B. American Period.
- 192A-192B. Far Eastern Diplomatic History. (3-3) Yr. Mr. Conroy

* Not to be given, 1949-1950.

- *193A-193B. The Middle Periods of Chinese History, 600-1600. (2-2) Yr. Mr. Bingham
Prerequisite: an elementary knowledge of Chinese history.
- *194A-194B. History of Modern China, 1600-1949. (2-2) Yr. Mr. Bingham
Prerequisite: course 19A-19B or 193A-193B or consent of the instructor.
- 195A-195B. History of Japan. (3-3) Yr. Mr. Brown
195A. Period of Chinese Influence.
195B. Period of Western Influence.
- 196A*-196B. Rise of Modern Institutions in Japan. (2-2) Yr. Mr. Brown
Prerequisite: course 19A-19B or 195A-195B.
196A. The *Zaibatsu*.
196B. The Totalitarian State.
- 197A-197B. Korean History. (2-2) Yr. Mrs. McCune
The cultural, social, and political development of the Korean people, with special attention to the international and domestic problems of the new nation.
198. Individual Conferences and Assigned Reading. (3) I and II.
Mr. Schaeffer (for the Committee on Comprehensive Examinations)
Intended for honor students, whose major is history, in their final semester before graduation.
199. Special Study for Advanced Students. (1-4) I and II. The Staff
Open to seniors and graduate students only.
Prerequisite: for students whose major is history, at least a B average in all history courses undertaken; for others, at least a B average in all courses undertaken.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201. Advanced Studies in the Sources and General Literature of the Several Fields of History. (2 or 4) I and II. The Staff
I. Japanese history (2), Mr. Brown. II. English history (2), Mr. Guttridge; United States history (2), Mr. Harper.
202. Historical Method and Bibliography. (2) I and II.
Mr. Van Nostrand, Mr. Kantorowicz
Designed especially for candidates for higher degrees in history. Stress is laid on practical exercises.
- *205. Historical Auxiliaries to Medieval Studies. (2) I. Mr. Kantorowicz
- *211A-211B. Seminar in Ancient History. (2-2) Yr. Mr. Van Nostrand
- 221A-221B. Seminar in Medieval History. (2-2) Yr. Mr. Schaeffer
- 225A-225B. Seminar in History of the Early Middle Ages. (2-2) Yr. Mr. Kantorowicz
- 235A-235B. Seminar in Russian History. (2-2) Yr. Mr. Lantzeff
- *236A-236B. Seminar in Modern Slavic History. (2-2) Yr. Mr. Kerner
- 241A-241B. Seminar in Modern European History. (2-2) Yr. Mr. Palm
- 243A-243B. Seminar in Modern European History. (2-2) Yr. Mr. Sontag
- 251A-251B. Seminar in English History. (2-2) Yr. Mr. Guttridge
- 260A-260B. Seminar in the History of Spain. (2-2) Yr. Mr. Van Nostrand
Prerequisite: course 160A-160B, a reading knowledge of Spanish, and French or German.

* Not to be given, 1949-1950.

- 261A-261B. Seminar in Hispanic-American History. (2-2) Yr. Mr. King
 *266A-266B. Seminar in Mexican History. (2-2) Yr. Mr. Hammond
 271A-271B. Seminar in the History of the American West. (2-2) Yr.
 Mr. Davis
 272A*-272B. Seminar in the Colonial Period of United States History. (2-2)
 Yr. Mr. Harper
 273A-273B. Seminar in the History of the Old South, the Civil War and Re-
 construction. (2-2) Yr. Mr. Stamp
 274A-274B. Seminar in the Recent History of the United States. (2-2) Yr.
 Mr. Hicks
 276A-276B. Seminar in the Social History of the United States. (2-2) Yr.
 Mr. Weeter
 277A*-277B. Seminar in the Early National Period of United States History.
 (2-2) Yr. Mr. Bean
 281A-281B. Seminar in North American History. (2-2) Yr. Mr. Kinnaird
 283A-283B. Seminar in Hispanic-American History. (2-2) Yr. Mr. Sluiter
 *291A-291B. Seminar in the History of the Far East. (2-2) Yr. Mr. Bingham
 292A-292B. Seminar in the Modern History of the Far East. (2-2) Yr.
 Mr. Conroy
 295A-295B. Seminar in Japanese History. (2-2) Yr. Mr. Brown
 298. Directed Research. (2-4) I and II. The Staff

HOME ECONOMICS

AGNES FAY MORGAN, Ph.D., Professor of Home Economics (Chairman of the Department).

RUTH OKEY, Ph.D., Professor of Home Economics.

JESSIE V. COLES, Ph.D., Associate Professor of Home Economics.

HELEN L. GILLUM, Ph.D., Associate Professor of Home Economics.

CATHERINE LANDETH, Ph.D., Associate Professor of Home Economics and Lecturer in Psychology.

BESSIE B. COOK, Ph.D., Assistant Professor of Home Economics.

BARBARA M. KENNEDY, Ph.D., Assistant Professor of Home Economics.

JEAN WARREN, Ph.D., Assistant Professor of Home Economics, Davis.

R. LORENE DRYDEN, M.S., Associate in Home Economics, Davis.

MILDRED JENTSCH, M.S., Associate in Home Economics, Davis.



LOTTE ARNICH, B.S., Lecturer in Home Economics.

MARGARET B. BREMNER, M.S., Lecturer in Home Economics.

DORIS F. HEINEMAN, B.A.E., Lecturer in Home Economics, Davis.

M. VIRGINIA JONES, Ph.D., Lecturer in Textiles.

AGNES C. MCCLELLAND, M.A., Lecturer in Home Economics.

EVE W. STRAIGHT, B.S., Lecturer in Institution Management.

Letters and Science List.—Courses 1A-1B, 6, 10, 14, 101A-101B, 111, 112A-112B, 114, 118A-118B, 132, 134, 142, 152, and 160 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Curriculum in Home Economics.—The requirements for this curriculum offered in the College of Agriculture are stated on page 92.

* Not to be given, 1949-1950.

LOWER DIVISION COURSES

- 1A-1B. Experimental Food Study. (3-3) Yr. Miss Kennedy
Lecture and laboratory.
Prerequisite: Chemistry 1A, 8. Recommended: Bacteriology 1 or 2.
Production and composition of food and principles involved in food preparation and preservation.
6. Introduction to Textiles. (3) II. Miss Jones
(Formerly numbered 7.)
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.
7. Elementary Clothing Study. (3) I. Miss McClelland
(Formerly numbered 5.)
Lecture and laboratory.
Prerequisite: Decorative Art 16A-16B.
Practical and cultural problems in modern garment design and construction.
10. Elementary Nutrition. (2) I and II. Mrs. Cook
A nontechnical presentation of the modern knowledge of foods and nutrition. (Not accepted as part of the general major in home economics.)
12. Euthenics. (2) I and II. Miss Bremner
A study of the function of the family and the homemaker in modern society, and of the contributions of the basic sciences and arts to the solution of present-day social and economic problems of the individual and the family.
14. Consumer Problems. (2) II. Miss Coles
A nontechnical discussion of consumers' problems, including income apportionment, consumer credit, buying aids, and protection of consumers. (Not accepted as part of the general major in home economics.)

UPPER DIVISION COURSES

Food Economics and Technology

100. Food Economics. (3) I. Miss Bremner
Lectures and field or laboratory work.
Prerequisite: courses 1A-1B, 141 (may be taken concurrently).
Field observation of manufacturing and distribution to observe practices related to problems of consumers including those buying foods in large quantities. Laboratory study of qualities of food in relation to use and price.
- 101A. Food Analysis. (3) I. Miss Kennedy
Lecture and laboratory.
Prerequisite: course 1A-1B and Chemistry 1B and 8; or Chemistry 1B and 8 with grade of at least B.
The principles of quantitative analysis applied to food materials; chemical analysis of typical carbohydrate, fat, and protein foods.
- 101B. Advanced Food Analysis. (3) II. Miss Kennedy
Lecture and laboratory.
Prerequisite: course 101A or Chemistry 5 with a grade of at least B.
Official analytical methods and legal standards used in the chemical analysis of sugars, grain products, dairy products, fats and oils, meats, etc.
Examination of foods for deterioration and adulteration.

105. Food Composition and Experimental Cooking. (3) II. Miss Kennedy
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8, and a college course in food preparation. Recommended: Bacteriology 1 or 2.
An introduction to the chemistry and technology of food composition and production and the principles of food preparation. Designed to meet the needs of transfer students who may substitute it for course 1A-1B.
- *108. Introduction to Research in Food Preparation and Control. (2) II. Miss Kennedy
(Formerly numbered 126.)
Two laboratory periods a week to be arranged. To be taken concurrently with course 109.
- *109. Recent Advances in Food Technology. (2) II. Miss Kennedy
(Formerly numbered 125.)
Prerequisite: course 101A.
A proseminar on late research in the chemistry of food composition, preparation, and control.

Nutrition and Dietetics

111. Nutrition. (3) I. Mrs. Cook
(Formerly numbered 103.)
Prerequisite: Chemistry 1A or high school chemistry and Physiology 1.
A brief study of the essential nutrients and their functions in nutrition; how to determine and satisfy the food needs of the normal individual.
(Not accepted as part of the major in the general curriculum in home economics and not open to students who have credit for course 10.)
- 112A-112B. Nutrition and Dietetics. (3-3) Yr. Miss Okey
(Formerly numbered 102A-102B.)
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8, Physiology 1, and course 1A-1B.
The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease; the planning and computation of diets.
114. Laboratory Methods in Metabolism. (3) II. Miss Okey
(Formerly numbered 106.)
Lecture and laboratory.
Prerequisite: course 101A or Chemistry 5, and Biochemistry 103 (may be taken concurrently).
Study of qualitative and quantitative reactions and procedures used in the analysis of biological materials of importance in nutrition.
115. Therapeutic Dietetics. (3) II. Mrs. Cook
(Formerly numbered 196.)
Lecture and laboratory.
Prerequisite: course 118A-118B (may be taken concurrently).
Problems in the planning and computation of dietaries for normal and pathological conditions.
- 118A-118B. Human Nutrition. (4-5) Yr. Mrs. Morgan, Miss Arnrich
(Formerly numbered 120A-120B.)
Lectures and laboratory. For course 118B there is an additional laboratory period.
Prerequisite: course 101A and Biochemistry 103, or course 101A and 114.
The fundamentals of nutrition established through typical experiments in calorimetry, digestion, nitrogen and mineral balances, vitamin tests; and the applications of these principles to practical feeding problems.

* Not to be given, 1949-1950.

130. The Nutrition of Development. (2 or 3) II. Mrs. Morgan
Lectures, laboratory, and field work.
Prerequisite: course 118A or Biochemistry 103. The lectures may be taken separately with a credit value of 2 units.
The chemistry and physiology of intrauterine development, lactation, and growth; normal and subnormal nutrition in infancy and childhood; practice in the solution of feeding problems.

Institution Economics

121. Institution Food Study. (4) I. Miss Gillum, Miss Straight
(Formerly numbered 110.)
Lectures, field or laboratory work, and three additional hours to be arranged.
Prerequisite: courses 1A-1B, 100, and 141.
The principles and problems involved in the preparation and service of food in institutions.
122. Institution Organization and Management. (3) II. Miss Gillum, Miss Straight
(Formerly numbered 111.)
Lectures and field or laboratory work.
Prerequisite: course 121 or consent of the instructor. Recommended: Business Administration 1A, 150, or Psychology 3 or 185.
The principles and problems involved in the organization and management of institution households such as residence halls, hospitals, hotels.
- 128A-128B. Proseminar in Hospital Dietetics. (2-2) Yr. Miss Gillum
(Formerly numbered 198A-198B.)
Open only to selected graduate students; given on the San Francisco campus.
426. Hospital Problems. (2) I and II. Miss Gillum
(Formerly numbered 497.)
Supervised practice in administrative problems of the hospital dietetic service carried on during residence in Berkeley and open only to selected graduate students.
427. Hospital Dietetics. (6) I and II. Miss Gillum
(Formerly numbered 498.)
Conferences and supervised practice in the dietetics department of the University of California Hospital and clinics.
Open only to selected graduate students.

Child Development

132. Child Psychology. (3) II. Miss Landreth
Prerequisite: Psychology 1A and 5. Not open to students who are taking or have taken Psychology 112, which is accepted as equivalent to 132 in the general home economics major.
A study of the factors concerned in the motor, sensory, language, mental, emotional, and social development of young children.
133. Laboratory in Child Development. (1) II. Miss Landreth
One lecture weekly and three hours to be arranged one day a week.
Prerequisite: course 132 (may be taken concurrently).
Laboratory supplement to course 132 conducted at the nursery school.
- *134. Child Care. (3) I. Miss Landreth
Prerequisite: Physiology 1, and (for nonmajor students) course 10 or 111 (may be taken concurrently).
A consideration of the physical development of children from prenatal through adolescent life and the factors affecting health during this period.

* Not to be given, 1949-1950.

135. Techniques with Young Children. (3) I and II. Miss Landreth
Lectures twice a week, and laboratory in the nursery school two mornings or two afternoons a week.
Prerequisite: courses 132 and 133, or Psychology 112 and 116.
435. Nursery School Administration. (3) I. Miss Landreth
Lectures twice a week, supervised practice in nursery schools, and related field work, six hours a week. Open only to graduate and senior students completing the major in child development.

Family Economics

140. Home Management. (3) II. Miss Bremner
Lectures and laboratory.
Prerequisite: Physiology 1 and Psychology 1A.
Use of time, energy, and equipment in the home from the point of view of the satisfaction of members of the family.
- 140L. Home Management Laboratory. (1-3) II. Miss Bremner
Prerequisite: course 140 (may be taken concurrently).
Laboratory includes home projects or living for six to eight weeks in the home-management house under supervision of the instructor. A two-hour weekly conference period is to be arranged.
141. Consumers and the Market. (3) I. Miss Coles
Prerequisite: Economics 1A-1B (may be taken concurrently).
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
(Not open to students who are taking or have credit for Agricultural Economics 101A or Business Administration 160.)
142. Social Problems of Families. (3) II. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Present-day problems of families as they are related to economic and social conditions.
144. Family Finance. (3) I. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

Home Furnishing

- *152. Home Furnishing. (3) II. _____
(Formerly numbered 190.)
Prerequisite: Decorative Art 16A-16B, 130A-130B (one of the latter may be taken concurrently).
A nonprofessional course designed to develop discrimination in values. A consideration of materials and their use involved in the furnishing of the home, and an analysis of current trends and materials available.

Clothing and Textiles

160. Textiles. (3) I. Miss Jones
Lectures and laboratory.
Prerequisite: course 6.
Technical analyses and evaluations of textile fibers and fabrics.

* Not to be given, 1949-1950.

162. Clothing Economics. (3) I. Miss Jones
Lectures and laboratory.
Prerequisite: course 6 and Economics 1A-1B.
A study of the problems involved in the selection, purchase, and care of household textiles and of clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries.
175. Advanced Clothing. (3) II. Miss McClelland
(Formerly numbered 167.)
Lecture and laboratory.
Prerequisite: courses 6 and 7.
Wardrobe planning and problems in advanced clothing construction.
176. Dress Design and Fashion Analysis. (3) II. Miss McClelland
(Formerly numbered 163.)
Prerequisite: course 7.
The design, draping, and construction of costumes based on the principles of design and color theory; past and current fashion trends and fashion merchandising methods.

SPECIAL STUDY COURSES APPLYING TO ALL MAJORS

199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mrs. Morgan in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

202. Seminar in Foods and Nutrition. (2) I. Miss Okey
(Formerly numbered 216.)
- *212. Seminar in Nutrition. (2) II. Mrs. Morgan
(Formerly numbered 219.)
218. Research in Food and Nutrition. (2-6) I and II.
(Formerly numbered 214.) The Staff (Mrs. Morgan in charge)
238. Research in Home Economics. (2-6) I and II.
The Staff (Mrs. Morgan in charge)
242. Seminar in Family Economics. (2) II. Miss Coles

(GIVEN AT DAVIS)

HOME ECONOMICS

- 1A-1B. Experimental Food Study. (3-3) Yr. Mrs. Jentsch
6. Introduction to Textiles. (3) II. Miss Dryden
(Formerly numbered 7.)
7. Elementary Clothing Study. (3) I. Miss Dryden
(Formerly numbered 5.)
- *10. Elementary Nutrition. (2) II. Mrs. Jentsch
14. Consumer Problems. (2) II. Miss Warren

Food Economics and Technology

- *100. Food Economics. (3) II. Mrs. Jentsch

Nutrition and Dietetics

- 112A-112B. Food and Dietetics. (3-3) Yr. Mrs. Jentsch
(Formerly numbered 102A-102B.)

* Not to be given, 1949-1950.

Child Development

132. Child Psychology. (3) I. _____

133. Laboratory in Child Development. (1) I. _____

134. Child Care. (3) II. _____

Family Economics

140. Home Management. (3) II. Miss Warren

*140L. Home Management Laboratory. (2) II. Miss Warren

*141. Consumers and the Market. (3) II. Miss Warren

142. Social Problems of Families. (3) I. Miss Warren

144. Family Finance. (3) I. Miss Warren

Housing and House Furnishing

150. The House. (2) II. Mrs. Heineman

*152. Home Furnishing. (2) II.
(Formerly numbered 190.) Mrs. Heineman*Clothing and Textiles*

162. Clothing Economics. (3) I. Miss Dryden

175. Clothing Design and Construction. (3) II.
(Formerly numbered 167.) Miss Dryden

SPECIAL STUDY COURSE

199. Special Study for Advanced Undergraduates. (1-5) Yr.

The Staff (Miss Warren in charge)

DECORATIVE ART

16A-16B. Theory of Design and Color. (2-2) Yr. Beginning either semester. Mrs. Heineman

130A. Interior Design. (2) I. Mrs. Heineman

ITALIAN

RUDOLPH ALTROCCHI, Ph.D., Professor of Italian.

MICHELE DE FILIPPIS, Ph.D., Professor of Italian (Chairman of the Department).
◇

GIOVANNI CECCHETTI, Dottore in Lettere, Lecturer in Italian.

Letters and Science List.—All undergraduate courses in Italian are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. De Filippis.

Preparation for the Major.—Required: 16 units of lower division courses or four years of high school Italian, or other equivalent to be tested by examination. Recommended: a reading knowledge of Latin.

The Major.—24 units of upper division courses of which at least 18 must be in Italian; 6 units must be chosen from courses in French, Spanish, Portuguese, or Classics.

The department recommends as a supplementary choice among the free electives: (a) history of the country or countries most intimately connected with the major, (b) related courses in other literatures, (c) the history of philosophy, (d) German, (e) Latin, (f) Greek.

* Not to be given, 1949-1950.

LOWER DIVISION COURSES

1. Elementary Italian. (4) I and II. Mr. De Filippis and Assistants
 2. Elementary Italian (continuation of 1). (4) I and II. Mr. De Filippis and Assistants
 Prerequisite: two years of high school Italian or course 1.
 3. Intermediate Italian, Review Grammar, Composition, and Reading. (4) I and II. Mr. De Filippis and Assistant
 Prerequisite: three years of high school Italian or course 2.
 4. Intermediate Italian (continuation of 3). (4) I and II. Mr. Cecchetti
 Prerequisite: course 3.

UPPER DIVISION COURSES

Sixteen units of lower division courses in Italian are required for admission to any upper division course. Only those students who pronounce correctly and read fluently will be admitted to upper division courses. Students who transfer from other institutions may be tested by examination.

100. Survey of Modern Drama from Goldoni to the Present. (3) II.
 Mr. De Filippis
 101A-101B. Advanced Grammar, Composition, and Conversation. (3-3) Yr.
 Mr. De Filippis
 103A-103B. Survey of Italian Literature. (3-3) Yr. Mr. De Filippis
 A study of standard authors in prose and verse; lectures in Italian and reports on assigned themes.
 104A-104B. Italian Literature of the Nineteenth Century. (3-3) Yr.
 Mr. Altrocchi
 Reading of texts, with a special study of literary technique. Lectures in Italian.
 109A-109B. Dante's *Divina Commedia*. (3-3) Yr. Mr. Altrocchi
 Prerequisite: 6 units of upper division work in Italian or the equivalent.
 *150A-150B. Dante's *Divine Comedy* in English Translation. (2-2) Yr.
 Mr. Altrocchi
 Designed for upper division students wishing the cultural background provided by such a masterpiece as Dante's, and for graduate students whose major field is not in Romance languages. Enrollment limited to students who have already completed some upper division work or who present other evidence of adequate preparation. No knowledge of Italian required. Will not be accepted toward the major in Italian. Course 150A is prerequisite to 150B.
 *151A-151B. The Renaissance. (2-2) Yr. Mr. De Filippis
 Emphasis on Italian literature and its ramifications in Europe. Lectures (in English) and reports on assigned subjects. No knowledge of Italian required.
 199. Special Study for Advanced Undergraduates. (1-3) I and II.
 Reading course with a short thesis. Mr. Altrocchi, Mr. De Filippis

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- *201A-201B. Italian Philology and Dialects. (2-2) Yr. _____
 206A-206B. Problems in Italian Grammar. (2-2) Yr. Mr. De Filippis
 A study of difficult points in grammar and syntax. Research and reports.

* Not to be given, 1949-1950.

207A-207B. Problems in Italian Literature. Seminar. (2-2) Yr.

Mr. Altrocchi

The period (Trecento or Quattrocento, etc.) or the special genre to be studied will vary; the purpose of the course is training in methods of literary research.

229. Special Study for Graduates. (1-4) I and II.

Mr. Altrocchi, Mr. De Filippis

JOURNALISM

ROBERT W. DESMOND, Ph.D., Professor of Journalism (Chairman of the Department).

PHILIP F. GRIFFIN, M.A., Assistant Professor of Journalism.

MARVIN ROSENBERG, M.A., Instructor in Journalism.



PAUL FREDERICKSEN, B.Litt., Lecturer in Journalism.

CLAIRE M. HAMILTON, M.A., Lecturer in Journalism.

LLOYD E. REEVE, Lecturer in Journalism for the fall semester.

GEORGE W. SEIDL, A.B., Lecturer in Journalism.

JOHN H. THOMPSON, Lecturer in Radio News Writing for the spring semester.

Letters and Science List.—Courses 120A-120B, 140, 141, and 190 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. DESMOND, Mr. GRIFFIN.

Preparation for the Major.—Required: History 4A-4B or History 17A-17B; Political Science 1 and 2; Economics 1A-1B; English 1A-1B or Speech 1A-1B.

The Major.—Required: Journalism 120A-120B, 140 and 130A-130B or 131 or 170; and any two of the following courses: Journalism 141, 150, 171, 190, 198, 199, Business Administration 160 and 163.

In addition, all majors are required to select a concentration of 15 units or two concentrations of 9 and 6 units in any other field or fields of study offered by other departments of the University. These concentrations should be selected on the basis of the student's competence and special interest and must be approved by the department. All courses in the concentrations must be from upper division offerings.

The department reserves the right to restrict the student to not more than 24 units of work in courses offered in the Department of Journalism.

Prospective majors are to submit in writing a proposed plan of study for the major, meeting the above requirements. The plan is to be submitted before or at the time the student consults with his major adviser.

Continuance in the major is contingent upon the student achieving at least a C grade in any course taken in the major or required for the major.

UPPER DIVISION COURSES

120A-120B. The News. (4-4) Yr.

Mr. Griffin

Two lectures and two two-hour laboratory sections.

Prerequisite: English 1A-1B or Speech 1A-1B.

A comparative study of representative newspapers and similar journals emphasizing professional and social problems of news presentation. The student will write critically from his observation of practices and experimentally in journalistic forms.

130A-130B. News Editing. (3-3) Yr.

Mr. Fredericksen, Mr. Hamilton, Mr. Seidl

One lecture and two two-hour laboratory sections.

Prerequisite: course 20A-20B with at least a grade of B in 20B, or consent of instructor to enroll. Course 130A is prerequisite to 130B.

Techniques of copyreading and headline writing, theories of news selection and make-up, examination of newspaper editorial practices.

*131. Editing the News. (3) I and II.

Two lectures and one two-hour laboratory section.

Prerequisite: course 120A-120B.

A study of the problems of newspaper content and display, with special attention to various newspaper audiences. A term report based upon the student's observation of a selected community and the newspaper serving it will be required.

140. History of Journalism. (3) I.

Mr. Desmond

Open to all upper division students, without prerequisite.

Study of the development of journalism, particularly in the United States, with an introduction to the important papers and personalities.

141. The Press and Society. (3) II.

Mr. Desmond

Open to all upper division students, without prerequisite.

An examination of the press as an important institution in the nation and in the world.

150. Contemporary Editorial Problems. (3) II.

Mr. Desmond

Prerequisite: courses 20A-20B, 130A-130B, or consent of the instructor.

An examination of current problems, with practice in bibliographical and research methods, and in writing in editorial and interpretive forms.

170. Principles of Publishing. (3) II.

Mr. Hamilton

Two lectures a week and one two-hour laboratory section.

Analysis of the economy, organization, and operation of daily and weekly newspapers.

171. Newspaper Advertising. (3) I and II.

Mr. Rosenberg

Two lectures a week and one two-hour laboratory period.

Analysis of advertising principles of the daily and weekly newspaper, with attention to typography, layout, copy writing, and production.

190. The Press and World Affairs. (3) I.

Mr. Desmond

Open to all upper division students, without prerequisite.

Comparative world journalism, with an examination of sources of news from various capitals, and consideration of influences that affect information reaching the people about public affairs.

198. Directed Group Studies for Upper Division Students. (3) I and II.

Mr. Griffin, Mr. Reeve, Mr. Thompson

Three sections. Students may take three sections and receive credit in all.

Prerequisite: senior standing and consent of the instructor.

Sec. 1. Reporting of Public Affairs. (3) I and II.

Mr. Griffin

Lectures, discussions, and special assignments relating to the reporting of news of municipal, county, and state government and of other public affairs.

Sec. 2. Writing of Special Articles. (3) I.

Mr. Reeve

Lectures, discussions, and individual conferences.

Class limited to twenty, with preference given to majors in journalism. Instruction in preparation and marketing of articles for magazines, specialized publications, syndicates, and newspaper feature sections.

* Not to be given, 1949-1950.

Sec. 3. Radio News Writing. (3) II.

Mr. Thompson

Lectures and discussions.

Class limited to eighteen, with preference given to majors in journalism.

Theory and practice of news writing for radio and special event reporting, with special attention to problems of auditory communication.

199. Special Study for Advanced Students. (1-4) I and II.

The Staff (Mr. Griffin in charge)

Open to seniors and graduate students only.

Prerequisite: for students whose major is journalism, at least a B average in all journalism courses undertaken, or consent of the instructor; for others, at least a B average in all courses undertaken, and consent of the instructor.

JURISPRUDENCE

BARBARA NACHTRIEB ARMSTRONG, A.B., J.D., Ph.D., LL.D., Professor of Law.

ALBERT A. EHRENZWEIG, Dr. Jur., J.D., LL.M., Professor of Law.

WILLIAM WARREN FERRIER, JR., A.B., J.D., Professor of Law.

RICHARD W. JENNINGS, A.B., A.M., LL.B., Professor of Law.

WILLIAM T. LAUBE, JR., A.B., J.D., LL.M., Professor of Law.

JAMES PATTERSON MCBAIN, LL.B., LL.D., A. F. and May T. Morrison Professor of Municipal Law.

COVEY T. OLIVER, A.B., LL.B., Professor of Law.

WILLIAM LLOYD PROSSEE, A.B., LL.B., Professor of Law (Chairman of the Department).

STANLEY S. SURREY, B.S., LL.B., Professor of Law.

HENRY W. BALLANTINE, A.B., LL.B., LL.D., John H. Boalt Professor of Law, Emeritus.

ALEXANDER M. KIDD, A.B., LL.B., Elizabeth Josselyn Boalt Professor of Law, Emeritus.

MAX RADIN, A.B., LL.B., Ph.D., LL.D., John H. Boalt Professor of Law, Emeritus.

EDWARD L. BARRETT, JR., B.S., LL.B., Associate Professor of Law.

FRANK C. NEWMAN, A.B., LL.B., LL.M., Associate Professor of Law.



CHARLES BUNN, A.B., LL.B., Emanuel S. Heller Visiting Professor of Law for the spring semester.

VERNON M. SMITH, A.B., LL.B., Librarian of the Law Library and Lecturer in Law.

GEORGE W. STUMBERG, A.B., LL.B., J.D., Elizabeth Josselyn Boalt Visiting Professor of Law for the spring semester.

JAMES L. WANVIG, B.S., LL.B., Lecturer in Law.

CURRICULUM OF THE SCHOOL OF JURISPRUDENCE

For admission requirements and for the requirements for the degree of Master of Laws (LL.M.) and of Doctor of the Science of Law (J.S.D.) consult the ANNOUNCEMENT OF THE SCHOOL OF JURISPRUDENCE.

Nonresidents of California enrolled as students in the School of Jurisprudence pay a fee of \$185 each semester, which includes the incidental fee charged to all students.

PROFESSIONAL CURRICULUM

First Year

200A-200B. Contracts. (3-3) Yr.

Mr. Laube

202. Crimes. (3) II.

Mr. Stumberg

204. Introduction to Law. (2) I. Mr. Ehrenzweig, Mr. Laube
 206A-206B. Procedure: First Course. (2-3) Yr. Mr. McBaine
 208A-208B. Property. (3-3) Yr. Mr. Ferrier
 (Formerly numbered 208.)
 210. Equity. (2) I. Mr. Newman
 212A-212B. Torts. (3-3) Yr. Mr. Prosser
- Second Year**
220. Administrative Law: First Course. (3) II. Mr. Newman
 222A-222B. Business Associations. (3-3) Yr. Mr. Ballantine
 *224A-224B. Constitutional Law. (2-2) Yr. Mr. Barrett
 (Formerly numbered 225.)
 §225. Constitutional Law: Second Course. (2) I. Mr. Barrett
 (Formerly numbered 226.)
 226A-226B. Wills and Future Interests. (2-2) Yr. Mr. Ferrier
 *228. Legal Accounting. (2) I. ———
 230. Marital Property. (2) I. Mrs. Armstrong
 §232. Procedure: Second Course. (2) II. Mr. Barrett
 §234. Property: Second Course. (2) I. Mr. Oliver
 236. Trusts. (2) I. Mr. Jennings
 237. Income Taxation. (3) II. Mr. Surrey
 (Formerly numbered 281.)
 238. Writing. (No unit credit) Yr. Mr. Smith, Mr. Wanvig
- Third Year**
240. Administrative Law: Second Course. (2) I. Mr. Newman
 242. Admiralty. (2) II. Mr. Stumberg
 244A-244B. Creditors' Rights and Security. (3-2) Yr. Mr. Wanvig
 245. Comparative Jurisprudence. (2) II. Mr. Ehrenzweig
 246. Conflict of Laws. (3) I. Mr. Ehrenzweig
 247. Corporation Finance. (2) I. Mr. Jennings
 248. Selected Problems in Corporation Law. (2) II. Mr. Jennings
 250A-250B. Evidence. (2-2) Yr. Mr. McBaine
 253. Family Law. (2) II. Mrs. Armstrong
 254. Federal Jurisdiction. (2) II. Mr. Bunn
 §256. Future Interests. (2) I. Mr. Oliver
 257. Insurance. (2) II. Mr. Ehrenzweig
 258. International Law. (2) II. Mr. Oliver
 262. Labor Law: First Course. (2) I. Mrs. Armstrong
 264. Labor Law: Second Course. (2) II. Mrs. Armstrong
 265. Advanced Legal Writing. (2) I and II. Mr. Prosser
 266. Legislation. (2) I. Mr. Surrey
 *267. Modern Pleading. (2) II. Mr. Barrett
 268. Municipal Corporations. (2) II. Mr. Jennings
 270. Government Regulation of Business. (2) II. Mr. Newman
 *272. Negotiable Instruments. (2) I. ———
 274. Restitution. (2) II. Mr. Laube
 276. Restraint of Trade and Unfair Competition. (3) II. Mr. Bunn

* Not to be given, 1949-1950.

§ To be given, 1949-1950 only.

- *278. Sales. (2) II. _____
 282. Estate, Inheritance and Gift Taxation. (2) I. Mr. Surrey
 284. Selected Problems in Taxation. (2) II. Mr. Surrey
 §286. Wills and Administration. (2) II. Mr. Oliver

Graduate Curriculum

- 287A-287B. Seminar in Administrative Law and Procedure. (2-2) Yr.
 Mr. Newman
 288A-288B. Seminar in Business Organizations. (2-2) Yr.
 Mr. Ballantine, Mr. Jennings
 289A-289B. Seminar in Commercial Transactions. (2-2) Yr.
 Mr. Laube, Mr. Prosser
 290A-290B. Seminar in Constitutional Law. (2-2) Yr. Mr. Barrett
 291A-291B. Seminar in Criminal Law and Procedure. (2-2) Yr. _____
 292A-292B. Seminar in International and Maritime Law. (2-2) Yr. _____
 293A-293B. Seminar in Labor Law and Procedure. (2-2) Yr.
 Mrs. Armstrong, Mr. Newman
 294A-294B. Seminar in Legal History and Jurisprudence. (2-2) Yr.
 Mr. Ehrenzweig
 295A-295B. Seminar in Legislation and Legislative Procedure. (2-2) Yr.
 Mr. Smith, Mr. Surrey
 296A-296B. Seminar in Practice and Procedure. (2-2) Yr.
 Mr. Barrett, Mr. McBaine
 297A-297B. Seminar in Property and Trust Administration. (2-2) Yr.
 Mr. Ferrier, Mr. Jennings
 298A-298B. Seminar in Public Finance and Taxation. (2-2) Yr. Mr. Surrey
 299A-299B. Seminar in Roman and Comparative Law. (2-2) Yr.
 Mr. Ehrenzweig

LIBRARIANSHIP

- DONALD CONEY, M.A., Professor of Librarianship.
 J. PERIAM DANTON, Ph.D., Professor of Librarianship (Chairman of the Department).
 CARLETON B. JOECKEL, Ph.D., Professor of Librarianship.
 EDITH M. COULTER, M.A., B.L.S., Professor of Librarianship, Emeritus.
 SYDNEY B. MITCHELL, M.A., Professor of Librarianship, Emeritus.
 DELLA J. SISLER, M.A., B.L.S., Associate Professor of Librarianship, Emeritus.
 ANNE ETHELYN MARKLEY, M.A., Associate Professor of Librarianship.
 LEROY C. MERRITT, Ph.D., Associate Professor of Librarianship.
 JOHN B. TOMPKINS, Ph.D., Instructor in Librarianship.
 ◇
 JESSE E. BOYD, M.A., Cert. in Libr., Lecturer in School Library Administration for the spring semester.
 DOUGLAS W. BRYANT, M.A., Lecturer in Librarianship.
 LEONE GARVEY, M.A., Lecturer in Librarianship for the spring semester.
 THOMAS S. SHAW, B.L.S., Lecturer in Librarianship.

The School of Librarianship is organized to offer a two-year curriculum. On completion of the first year with an average grade of at least C plus (1.5 grade-point average) the Bachelor of Library Science (B.L.S.) degree is

§ To be given, 1949-1950 only.

awarded. The degree of Master of Library Science is granted to students who complete with an average grade of at least B the second-year curriculum. Candidates for this degree are subject to all general university regulations governing it (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

Applicants for admission to either curriculum should send to the Dean of the School transcripts of their academic records in order that their qualifications for admission to the School may be determined. Full graduate standing in the University of California, which is determined by the Dean of the Graduate Division, is required for admission. (For regulations concerning such status see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.)

Program for the Degree of Bachelor of Library Science

To secure adequate opportunity for those who enroll in the School, only a limited number will be accepted for the first-year curriculum. No one should come to Berkeley without previously having made application to the School and having received notice of acceptance. Early application is desirable. Selection is based primarily on scholarship. New first-year students will not be admitted at the opening of the spring semester.

The work is organized as a professional curriculum and particular subjects may not, as a rule, be taken separately. The courses are planned to occupy a student's entire time and only the exceptional or previously experienced should expect to do any outside work.

Preliminary Preparation.—A good general education is the best basis for librarianship. The Dean of the School will be glad to give advice in reference to undergraduate courses. Two modern languages (not less than 8 college semester units of each) are required for admission. German and French are particularly recommended. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Experience in library work is highly desirable but is not required for admission.

Applicants are required to take the Profile Tests of the Graduate Record Examination and should do so, if possible, not later than the spring of the year of application.

Applications from those who obtain less than a 1.5 grade-point average in their last two years of college or university work cannot be considered.

Applications from those over thirty-five years of age will be considered only when the applicants hold responsible library positions from which they can obtain leaves of absence. Exceptions to this rule may be considered only under unusual circumstances, such as applicants having a doctor's degree.

State Credential for School Librarians.—The California State Department of Education accepts the completion of the first year's work in satisfaction of its technical requirements for the special credential in librarianship, but candidates for it must also do directed practice work in school libraries during the second semester. To meet additional requirements of the State Department of Education for this credential, candidates should take the following courses before enrollment in the School, or after the completion of the first year's work: secondary education, educational psychology, and junior high school education, elementary education or reading and literature in the elementary school (totaling at least 9 units).

PROFESSIONAL COURSES

In 1949-1950, courses in librarianship will be offered only in the fall and spring semesters. Students may begin the first-year curriculum only at the opening of the fall semester and complete it in the spring semester. The second-year curriculum may be commenced in either the fall or spring semesters, and electives may be taken in summer sessions or in any semester.

First-Year Curriculum

The 24-unit program of each student must include the following basic courses: 201, 202, 203, 204; the remaining units are to be elected from other courses in the first-year curriculum and may include one course from upper division or graduate courses in an appropriate subject approved by the Dean of the School of Librarianship. Students who fail to make at least a C plus (1.5 grade-point average) in the first semester will not be permitted to enroll in the second semester.

201. Classification and Cataloguing. (4) I. Miss Markley
Introduction to library classification with application of Dewey decimal system and brief comparison with Library of Congress system; functions of the catalogue; principles of catalogue entry based on American Library Association catalogue rules; methods of descriptive cataloguing based on modification of Library of Congress rules; introduction to subject cataloguing based on Sears, and Library of Congress lists of subject headings. Emphasis is placed upon acquiring familiarity with literature and tools of cataloguing.
202. Bibliography and Reference Materials. (3) I. Mr. Shaw
Lectures, discussions, and reports on assigned problems.
Basic reference materials including national and subject bibliography.
203. Introduction to Librarianship. (3) I. Mr. Danton
Orientation of the new student in the profession of librarianship. Introductory survey of the evolution of modern libraries and basic information about the principal fields of library service, with emphasis on major trends and problems. Readings and written reports.
204. Communication: History, Institutions, Media. (2) I. Mr. Merritt, Mr. Tompkins
Conspectus of the development of communication from the growth of language through the pictograph, the codex, the book, radio, motion picture, microfilm, and all other media for the recording and transmission of knowledge in the modern world. Development of institutions which use these media, with special emphasis on the growth and place of libraries in the whole structure.
205. Book Buying and Book Selection. (2) II. Mr. Merritt
Theories, principles, and practice of selecting books and other library materials. Techniques of acquisition by public, school, and academic libraries.
206. School Library Administration. (2) II. Miss Boyd
A general survey of elementary and secondary school libraries. Emphasis on the function, administration, organization, services, materials, and the planning and equipment of school libraries in relation to the modern school. Lectures, committee and individual reports, readings, class discussions, and field trips. Experiences gained in practice work are utilized.
207. Municipal and County Library Administration. (2) II. Mr. Joeckel
Government, organization, and administration of municipal, county, and regional public libraries. Library service programs in relation to varying community patterns. Lectures, readings, reports, field trips.
208. College and University Library Administration. (2) II. Mr. Danton
A general introduction to the organization and administration of college and university libraries and their place in the institutions of which they are a part. Problems and practices with respect to the library's government, functions, staff, collections, finances, and building are considered by means of written assignments, readings, and class discussion.

209. *Library Work with Children.* (2) II. Miss Garvey
Lectures and discussion.
A general survey of children's books and reading preferences. Historical backgrounds and development; types of children's literature; levels of interest; criticism and evaluation; illustration; trends; book selection; storytelling; organization and administration of a children's room in a public library.
210. *Special Library Administration.* (2) II. Mr. Merritt
Administration of special libraries in business, industry, and government. Special emphasis on departmental libraries in public and university libraries. Theory of selecting, acquiring, and using special library materials.
211. *Development of the Book.* (2) II. Mr. Tompkins
Materials and techniques of book production. Early records and the manuscript period. Development of paper, type, and binding. Letterpress, offset, rotogravure, and other methods of printing. Modern developments in recording on disks, film, and wire.
212. *Reference and Government Publications.* (4) II. Mr. Shaw
A continuation of course 202. Sources of information in subject fields. Emphasis is placed on types of information in foreign, national, state, and municipal documents. Problems in informational service.
213. *Cataloguing for Public, School, and Special Libraries.* (2) II. Miss Markley
Prerequisite: course 201 or equivalent.
Variations in descriptive cataloguing; special subject heading lists and classification systems; indexing, abstracting, and filing; administration of cataloguing routines; laboratory practice.
214. *Cataloguing for University and Research Libraries.* (2) II. Miss Markley
Prerequisite: course 201 or equivalent.
Cataloguing and classification of library materials requiring special description and analysis; practice in the use of Library of Congress classification and subject headings; arrangement of the catalogue; administration of the cataloguing department.
215. *Reading and Reading Interests.* (2) II. Mr. Merritt
Reading interests, habits, and needs of different types and groups of readers. The nature of reading; problems of reading; selection of reading by children, college students, and public library patrons.

Program for the Degree of Master of Library Science

Candidates for the master's degree must be accepted in full graduate status in the University of California and must have completed with a grade of at least B the first-year curriculum in a graduate—Type I or II—library school, accredited by the American Library Association and approved by the University of California. Professional library experience before undertaking advanced work is recommended.

Candidates for the master's degree must take 24 units of upper division and graduate courses. Twelve of these must be selected from the second-year curriculum of the School of Librarianship. The remaining 12 units may be selected from this same curriculum or from second-semester first-year courses not previously taken, or from upper division or graduate courses in subjects related to the particular interest of the student. In every case the program is subject to the approval of the Dean. Comprehensive final examinations and completion of a special study course are required of every candidate. An average grade of at least B must be maintained during the period in which the work for the master's degree is taken. Students must complete their work for the degree within five years from the date of first enrollment.

Any course in the second-year curriculum is open to any graduate student who satisfies the instructor of his ability and preparation to undertake the work, even though he is not a candidate for a master's degree in this school and cannot qualify for it.

218. Advanced Cataloguing. (2) II. Miss Markley
 Modern trends and problems in cataloguing with emphasis on coöperative cataloguing, cataloguing policies, and the handling of unusual types of material; study of the theory of subject cataloguing; discussion and reports.
219. Advanced Classification. (2) I. Miss Markley
 History and theory of classification; comparative study of library classification systems leading, in the latter half of the semester, to intensive study and use of the Library of Congress system; individual problem or paper.
- 220A-220B. Bibliography. (2-2) Yr. Mr. Shaw
 Prerequisite: course 202 and 212 or equivalent.
 Methods and materials of bibliographical investigation. Location and description of books and manuscripts in special collections in America. Problems and reports.
221. Book Collecting for University Libraries. (2) I. Mr. Tompkins
 Prerequisite: courses 205, 208.
 Problems connected with the acquisition, development, and maintenance of the book, periodical, and other collections of university libraries. Required of all master's degree candidates who intend to specialize in the college and university library field.
225. History of Libraries. (2) II. Miss Markley
 Growth and development of the library as an institution in ancient, medieval, and modern civilizations. The effect of political and social changes on the migration of manuscripts and books. Reports and papers.
226. History of Printing. (2) II. Mr. Bryant
 Prerequisite: course 211 or equivalent.
 Intensive study in selected phases of the history of printing; seminar discussion and individual projects of a bibliographical, historical, or book production nature.
228. Problems in Reading. (2) II. Mr. Merritt
 Prerequisite: course 215.
 Analysis of reading of college students and the general adult population in terms of characteristics and interests of readers, distribution and content of publications, methods of stimulating reading, and the effects of reading.
230. Library Administration. (2) I. Mr. Merritt
 The basic advanced course in the principles and practice of library administration. Analysis of the organization and management of modern libraries of various types. Prerequisite to courses 232, 233, 234.
232. University Library Administration. (2) II. Mr. Coney
 Prerequisite: courses 208, 230.
 Study of current issues in personnel, finance, service, and the organization of materials and work. Individual projects, work periods, consultation, reports, and class discussion. Required of all master's degree candidates who intend to specialize in the college and university library field.
- *233. School Library Administration. (2) I. _____
 Prerequisite: course 230.
 Subject: Junior College Libraries.
 Problems and practices of secondary school libraries, with emphasis on the collections and instructional program of the junior college library.

* Not to be given, 1949-1950.

234. Problems in Public Library Administration. (2) II. Mr. Joeckel
Prerequisite: course 230.
Detailed application of the principles of public administration to the management and operation of public libraries. Case study approach through critical analysis of the functions and problems of selected libraries. Assignments adapted to special interests of students. Required of all master's degree candidates who intend to specialize in the public library field.
238. Library in the Community. (2) I. Mr. Tompkins
Analysis of the community for the librarian. Social backgrounds, economic and educational levels, and community groups, as they affect library use. Methods of integrating the library with the community.
240. Content Analysis. (2) II. Mr. Tompkins
Problems in methods of determining maturity level, social and moral attitudes, and other educational and propagandistic assumptions in books, magazines, and other library materials.
251. Methods of Research in Librarianship. (2) I. Mr. Merritt
History and function of research in contemporary society. Values and meaning of research. Techniques of bibliographical, historical, and sociological research, and their implications for the definition and investigation of library problems. Required of all candidates for the master's degree.
299. Special Study. (4-8) I and II. The Staff (Mr. Joeckel in charge)
Individual direction of student's choice, planning and writing of master's essay. May be elected either semester.

LINGUISTICS

Group in Linguistics:

- †PETER A. BOODBERG, Ph.D., Professor of Oriental Languages.
ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology.
FRANCIS J. CARMODY, Ph.D., Professor of French.
YUEN REN CHAO, Ph.D., Litt.D., Professor of Oriental Languages and Linguistics.
- ²MURRAY B. EMENEAU, Ph.D., Professor of Sanskrit and General Linguistics.
ROBERT H. LOWIE, Ph.D., Sc.D., Professor of Anthropology.
ROBERT K. SPAULDING, Ph.D., Professor of Spanish.
- †C. DOUGLAS CHRÉTIEN, Ph.D., Associate Professor of Speech.
ARTHUR E. HUTSON, Ph.D., Associate Professor of English.
YAKOV MALKIEL, Ph.D., Associate Professor of Romance Philology.
- †OLEG A. MASLENKOV, Ph.D., Associate Professor of Slavic Languages.
- *MADISON S. BEELER, Ph.D., Assistant Professor of German.
MARY R. HAAS (Mary Haas Subhanka), Ph.D., Assistant Professor of Siamese and Linguistics (Acting Chairman of the Group in Linguistics).

Instruction in linguistics is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments. The degrees of Master of Arts and Doctor of Philosophy will be conferred upon qualified graduate students who complete the requirements. Prospective candidates for these degrees should consult the Chairman of the Group in Linguistics.

Courses in specific languages are offered by the departments of Classics (Greek, Latin, Sanskrit), English (Old and Middle English, Celtic), French, German (including Old and Middle High German, Gothic, Old Saxon, Old

† Sabbatical leave in residence, 1949-1950.

* Absent on leave, 1949-1950.

² In residence spring semester only, 1949-1950.

Icelandic), Italian, Near Eastern Languages (Hebrew, Arabic, Syriac, Assyrian, Sumerian, Egyptian, Coptic), Oriental Languages (Chinese, Japanese, Malay, Mongolian, Tibetan, Siamese), Romance Philology (Late Latin, Provençal), Scandinavian Languages and Literature (Swedish, Norwegian, Danish), Slavic Languages (Russian, Polish, Serbo-Croatian, Czech, Old Church Slavic, Early Russian), and Spanish and Portuguese.

In addition, attention is invited to the following more general courses:

Language and Culture (Anthropology 120, Mr. Rowe).

Introduction to General Linguistics (Classics 193, Mr. Emeneau).

Linguistic Analysis (Classics 195, Mr. Emeneau).

Introduction to Indo-European Comparative Grammar (Classics 196, Mr. Emeneau).

Language (English 25, Mr. Hutson, Mr. Reed).

Phonetics and Phonemics (Oriental Languages 167, Miss Haas).

Types of Linguistic Structure (Oriental Languages 177, Miss Haas).

Language and Culture in East Asia (Oriental Languages 193, Mr. Schafer).

Linguistics Laboratory (Oriental Languages 197A-197B, Miss Haas).

Seminar in Descriptive Linguistics (Oriental Languages 207A-207B, Miss Haas).

Seminar in Historical Linguistics (Oriental Languages 227A-227B, Miss Haas).

Linguistic History of the Roman Empire (Romance Philology 200, Mr. Malkiel).

Late Latin Language and Literature (Romance Philology 201, Mr. Malkiel).

General Romance Linguistics (Romance Philology 202, Mr. Malkiel).

Comparative Romance Phonetics (Romance Philology 204A-204B, Mr. Carmody).

English Phonetics (Speech 103, Mr. Chrétien).

MATHEMATICS

BENJAMIN A. BERNSTEIN, Ph.D., Professor of Mathematics.

THOMAS BUCK, Ph.D., Professor of Mathematics.

GRIFFITH C. EVANS, Ph.D., Professor of Mathematics.

† DERRICK H. LEHMER, Ph.D., Professor of Mathematics.

HANS LEWY, Ph.D., Professor of Mathematics.

MICHEL LOËVE, Docteur ès Sciences, Professor of Mathematics.

SOPHIA LEVY McDONALD, Ph.D., Professor of Mathematics.

CHARLES B. MORREY, JR., Ph.D., Professor of Mathematics (Chairman of the Department).

ANTHONY P. MORSE, Ph.D., Professor of Mathematics.

¹ JERZY NEYMAN, Ph.D., Professor of Mathematics and Director of the Statistical Laboratory.

* RAPHAEL M. ROBINSON, Ph.D., Professor of Mathematics.

ALFRED TARSKI, Ph.D., Professor of Mathematics.

JOHN H. McDONALD, Ph.D., Professor of Mathematics, Emeritus.

CHARLES A. NOBLE, Ph.D., Professor of Mathematics, Emeritus.

ALFRED L. FOSTER, Ph.D., Associate Professor of Mathematics.

JOHN L. KELLEY, Ph.D., Associate Professor of Mathematics.

RAYMOND H. SCIOBERETTI, Ph.D., Associate Professor of Mathematics.

PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.

FRANTISEK WOLF, Ph.D., Associate Professor of Mathematics.

† Sabbatical leave in residence, 1949-1950.

* Absent on leave, 1949-1950.

¹ In residence fall semester only, 1949-1950.

EDWARD W. BARANKIN, Ph.D., Assistant Professor of Mathematics.
 STEPHEN P. DILIBERTO, Ph.D., Assistant Professor of Mathematics.
 PAUL R. GARABEDIAN, Ph.D., Assistant Professor of Mathematics.
 JOSEPH L. HODGES, JR., Ph.D., Assistant Professor of Mathematics.
 ROBERT C. JAMES, Ph.D., Assistant Professor of Mathematics.
 ERICH L. LEHMANN, Ph.D., Assistant Professor of Mathematics.
 EDMUND PINNEY, Ph.D., Assistant Professor of Mathematics.
 ABRAHAM SEIDENBERG, Ph.D., Assistant Professor of Mathematics.
 *CHARLES M. STEIN, Ph.D., Assistant Professor of Mathematics.
 LEE H. SWINFORD, Ph.D., Assistant Professor of Mathematics.
 ARTHUR R. WILLIAMS, Ph.D., Assistant Professor of Mathematics.
 HUGO B. RIBEIRO, Ph.D., Instructor in Mathematics.
 MARIANNE F. SMITH, Ph.D., Instructor in Mathematics.
 VIRGINIA W. WAKERLING, Ph.D., Instructor in Mathematics.
 STANLEY NASH, M.A., Associate in Mathematics.



EVELYN FIX, Ph.D., Lecturer in Mathematics.
 HARRY M. HUGHES, M.A., Lecturer in Mathematics.
 TERRY A. JEEVES, A.B., Lecturer in Mathematics.
 GEORGE M. KUZNETS, Ph.D., Associate Professor of Agricultural Economics.
 RALPH M. LAKNESS, M.A., Lecturer in Mathematics.
 HENRY B. MANN, Ph.D., Visiting Professor of Mathematics.
 TING K. PAN, Ph.D., Lecturer in Mathematics.
 STEFAN PETERS, Ph.D., Lecturer in Mathematics and Associate Professor of Insurance.
 ELIZABETH L. SCOTT, A.B., Lecturer in Mathematics.

Letters and Science List.—All undergraduate courses in mathematics except courses 107, 122, 142A, 142B, 142C, 142D, 144 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Foster, Miss Sperry, Mr. Lehmann (*Statistics*).

Preparation for the Major.—*Adviser:* Mr. Pinney.

Before taking the upper division courses for the major, the student should have a basis of knowledge equivalent to courses C, G, 9, 8, 3A–3B, 4A–4B. It is desirable, therefore, that he should have completed in high school two years of algebra, plane and solid geometry, and trigonometry, in order to anticipate as much of this work as possible. The student who plans to take extensive work in statistics may substitute course 12 for course 9.

The Major.—In the 24 units of upper division work required for the major in mathematics, the student is supposed to acquire competence in algebra, analysis, and geometry. The courses designed for this purpose are 111A–111B, 112A–112B, 119A–119B, in each of which at least 3 units should be taken.

The Major in Mathematical Statistics.—This major consists of 24 units of upper division courses including courses 111A, 113, 120A–120B, and 150A or 201A, and 119A or 112B. The 24 units should in all cases make a consistent program, but need not always be restricted entirely to courses in mathematics and statistics.

Subject to the requirement of competence in the above majors, and with the approval of the adviser, the student is at liberty to take theoretical courses in physics, astronomy, or other sciences as part of his major in mathematics or mathematical statistics, as well as other upper division courses in mathematics.

* Absent on leave, 1949–1950.

Course 201A-201B forms a desirable part of the program for senior students with facility for mathematics. Courses listed under Statistics may of course be used as part of the mathematics major. Special attention is directed also to the course in analytic mechanics, Physics 105A-105B. Students preparing for the Civil Service Examination in statistics should take course 132.

The attention of the student is directed to the possibility of making group majors with other departments. Such majors will be welcomed not only with the departments of the physical sciences, but also with some of the social sciences and philosophy. In particular, the attention of those who are interested in logic is directed to Philosophy 12A-12B, as well as to Mathematics 109A-109B.

Colleges of Engineering and Chemistry.—The minimum requirements for admission to the freshman course (3A-3B, or 3) are two years of high school algebra or Mathematics D, plane geometry, and plane trigonometry. Prospective engineering students are urged, however, to add a half-year of solid geometry to this minimum preparation.

School of Business Administration.—Course 2, mathematics of finance and business, is a prerequisite for students in the School of Business Administration. As an alternative, however, course 11A-11B, analytic geometry and calculus, or course 3A-3B, plane analytic geometry and calculus, may be substituted, if students wish to continue with advanced mathematics.

LOWER DIVISION COURSES

- C. Trigonometry. (3) I and II. Mr. Pinney and the Staff
Prerequisite: plane geometry; one and one-half years of high school algebra or course D.
Course C includes plane trigonometry and spherical right triangles.
- D. Intermediate Algebra. (3) I and II. Mr. James and the Staff
(Formerly numbered 1.)
Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Not open to students who have received credit for two years of high school algebra, or course 3A or 8.
- G. Solid Geometry. (2) I and II. Mr. Pan and the Staff
(Formerly numbered E.)
1. College Algebra. (3) I and II. Miss Sperry and the Staff
(Formerly numbered G.)
Review and practice in general ideas and applications of algebra and trigonometry. Methods of proof and scientific procedure as exemplified in these subjects.
Open only to students who have had the prerequisites for course 3A but who fail in the qualifying examination for that course. Students who show little or no knowledge of algebra will not be allowed to enroll.
2. Mathematics of Finance and Business. (3) I and II. Mr. Bernstein and the Staff
Prerequisite: two years of high school algebra or course D. Prescribed in the School of Business Administration. Not open to students who have completed or are taking Engineering 120.
- 3A. Analytic Geometry and Calculus, First Course. (3) I and II. Mr. Morrey and the Staff
Prerequisite: two years of high school algebra or course D (passed with a grade of C or better); plane geometry, plane trigonometry. Students who do not meet these prerequisites may take examinations in these topics at the beginning of the term. These examinations are in addition to the qualifying examination.
The qualifying examination in algebra will be given early in the week of registration. See announcements of qualifying examinations on

bulletin boards. Students who fail this test will be required to pass course I before taking course 3A.

Elements of differential calculus and analytic geometry.

3B. Analytic Geometry and Calculus, Second Course. (3) I and II.

Mr. Foster and the Staff

Prerequisite: course 3A or course 11A-11B.

Continuation of 3A. Analytic geometry, differential and integral calculus.

Special sections are arranged for students who have taken a semester course of analytic geometry without calculus.

3H. Analytic Geometry and Calculus, Second Course. (4) I and II.

Mr. Foster

Prerequisite: same as for 3B but with high attainment; admission on recommendation of the department.

Course meets three times a week and is designed for students with special facility for mathematics. One unit of material additional to course 3B will be covered.

3. Analytic Geometry and Calculus, First and Second Courses. (6) I and II.

Mrs. Wakerling and the Staff

Prerequisite: same as for 3A except that superior preparation is required.

4A. Analytic Geometry and Calculus, Third Course. (3) I and II.

Prerequisite: course 3B.

Mr. Kelley and the Staff

Continuation of 3B. Thorough technique of differential and integral calculus.

4G. Analytic Geometry and Calculus, Third Course. (4) I and II.

Mr. Kelley

Prerequisite: same as for 4A, but with high attainment and preferably course 3H; admission on recommendation of the department.

Course meets three times a week and is designed for students with special facility for mathematics. One unit material additional to course 4A will be covered.

4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.

Prerequisite: course 4A.

Mr. Wolf and the Staff

Continuation of 4A. Geometry and analysis of functions of several variables, partial derivatives, multiple integrals.

4H. Analytic Geometry and Calculus, Fourth Course. (4) I and II. Mr. Wolf

Prerequisite: same as for 4B, but with high attainment and preferably course 4G; admission on recommendation of the department.

Course meets three times a week and is designed for students with special facility for mathematics. One unit material additional to course 4B will be covered.

4. Analytic Geometry and Calculus, Third and Fourth Courses. (6) II.

Prerequisite: same as for 4A.

8. Theory of Algebraic Equations. (3) I and II.

Mr. Pan, Mr. Ribeiro

Prerequisite: two years of algebra in the high school (or course D) and course 3A.

Determinants, equations of third and fourth degrees, theory of equations.

9. Introduction to Projective Geometry. (3) I and II.

Mr. Seidenberg

(Formerly numbered 6.)

Prerequisite: course G or high school solid geometry, and course 8 or its equivalent.

Projective theory of one-dimensional forms, point and line conics. Mainly by the synthetic method.

10. Spherical Trigonometry. (2) I and II. Mr. Pan
 Prerequisite: one and one-half years of high school algebra, or course D, and plane trigonometry. Not open to students who have credit in Astronomy 8.
- 11A-11B. Analytic Geometry and Calculus. (3-3) Yr. Mr. Swinford and the Staff
 Prerequisite: one and one-half years of high school algebra or course D; plane geometry; plane trigonometry.
 The elements of analytic geometry and of differential and integral calculus. Completion of this year course will satisfy the prerequisite requirement for course 3B.
 Credit for each part of this course will be limited to two units for a student who already has the prerequisites for course 3A.
12. Elements of Probability and Statistics. (3) I and II. (See Statistics below.)
- 14A-14B. Calculus and Advanced Calculus. (5-5) Yr. Mrs. McDonald, Mr. Sciobereti
 Prerequisite: course 3B.
 Covers approximately the subject matter of courses 4A-4B, 110A-110B.

UPPER DIVISION COURSES

- 101A-101B. Elementary Mathematics for Advanced Students. (3-3) Yr. Mr. Swinford, Mrs. McDonald
 101A: Mr. Swinford. 101B: Mrs. McDonald.
 Prerequisite: courses 4A-4B, 8, 9. Course 101A is not prerequisite to 101B.
 Selected topics in algebra and geometry with particular emphasis on historical development.
 Designed for students who are preparing to teach mathematics in secondary schools.
107. Mathematics in Secondary Schools. (2) I. Mrs. McDonald
 Enhancing content through applications; coordination; survey of materials; analysis of present-day tendencies. For seniors and graduate students. This course will be accepted in partial satisfaction of the requirement in education for the Certificate of Completion of the teacher-training curriculum.
- 109A-109B. Mathematical Logic. (3-3) Yr. Mrs. Szmielew
 Prerequisite: courses 3A, 3B, 8, or one of these and Philosophy 12A-12B.
 Elementary mathematical logic: sentential connectives, quantifiers, identity. Applications to the formalization of mathematical theories.
 Elements of set theory: axiomatic foundations; operations on sets; relations, functions; set-theoretical equivalence; ordering and well ordering; cardinal and ordinal arithmetic.
- 110A-110B. Advanced Engineering Mathematics. (2-2) Yr. Beginning each semester. Mr. Buck, Mr. James, Mr. Lakness, Mrs. McDonald, Mr. Pan, Mr. Sciobereti, Mrs. Smith
 Prerequisite: course 4A-4B. Primarily for students in engineering.
 Conjugate functions, hyperbolic functions, Fourier series, differential equations.
110. Advanced Engineering Mathematics. Double Course. (4) II. The Staff
 Prerequisite: same as for 110A-110B.
- 111A. Algebra. (3) I and II. Mr. Foster, Mr. Lehmann
 Prerequisite: courses 4A-4B, 8.
 Linear dependence, matrices, invariants, quadratic forms.

- 111B. Algebra. (3) I and II. Mrs. Smith
Prerequisite: courses 4A-4B, 8. Course 111B may precede 111A if this order is unavoidable.
Groups, theory of equations, introduction to Galois theory.
- 112A. Projective Geometry. (3) II. _____
Prerequisite: courses 4A-4B, 9, 111A.
Projective coördinates. Loci of the second order. Higher plane curves.
- 112B. Metric Differential Geometry. (3) I and II. Miss Sperry
Prerequisite: course 4A-4B. Course 112A is not prerequisite to 112B.
Vector analysis. Study of curves and surfaces in three dimensions.
113. Second Course in Probability and Statistics. (3) I and II. (See Statistics below.)
- 115A-115B. The Theory of Numbers. (3-3) Yr. Mr. Lewy
Prerequisite: course 8. Course 115A is not prerequisite to 115B.
Divisibility, congruences, number systems.
117. Analysis of Mathematical Problems. (2) I. Mr. James
Prerequisite: upper division standing in mathematics; intended primarily for honor students.
Methods of attack on mathematical problems, without respect to particular field.
118. Analysis of Mathematical Problems. (2) II. Mr. Lewy
Prerequisite: upper division standing in mathematics; intended primarily for honor students.
Methods of attack on mathematical problems, without respect to particular field. Course 117 is not prerequisite to 118.
- 119A-119B. Differential Equations. (3-3) Yr. Beginning each semester.
Mr. Diliberto, Mr. Morse, Mr. Pinney,
Mr. Swinford, Mrs. Wakerling, Mr. Wolf
Prerequisite: course 4A-4B, with honor grades; or 14A-14B; or 4A-4B and 110A-110B; or consent of the instructor.
Differential equations and analysis. Numerical solutions of differential equations, general properties and special types of differential equations; Bessel functions and Legendre polynomials.
- 120A-120B. Theory of Probability and Statistics. (3-3) Yr. (See Statistics, below.)
121. Mathematical Introduction to Economics. (3) I. Mr. Evans
Prerequisite: course 4A-4B.
Monopoly, competition, theory of dimension, taxation, utility, economic dynamics.
- 127A-127B. Foundations of Mathematics. (3-3) Yr. Mr. Bernstein
Course 127A is not prerequisite to 127B.
Mathematical development of logic, and the logic of algebra and geometry.
- *128. Numerical Analysis. (3) II. Mr. Lehmer
Prerequisite: course 110A or 119A.
The practical aspects of computational methods for problems in applied mathematics. Finite difference methods and their applications to numerical integration, solution of equations, and numerical integration of ordinary and partial differential equations. Methods for large-scale computing systems.
- 142A-142B. Life Contingencies. (3-3) Yr. (See Statistics, below.)

142C-142D. Laboratory Course in Life Contingencies. (1-1) Yr. (See Statistics, below.)

*144. Population Statistics. (3) II. (See Statistics, below.)

150A-150B. Theory of Functions, First Course. (3-3) Yr. Mr. Morrey

Prerequisite: course 4B.

Thorough critical development of analysis: limit theorems, Jacobians, measure, generalizations of integral, complex, and real variables.

Designed primarily for students who will work for higher degrees in mathematics and statistics. It may be followed by course 165A or course 201B.

165A-165B. Probability Theory and Its Analytic Basis. (3-3) Yr. (See Statistics, below.)

*185. Special Topics in Real and Complex Variables. (3) I. Mr. Barankin

Prerequisite: course 150A-150B.

Lebesgue-Stieltjes integral, analytic functions, orthogonal expansions.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

Mr. Pinney in charge

Investigation of special problems under the direction of members of the department. In particular, this course offers an opportunity to students with facility for mathematics to anticipate some of the advanced courses by individual study.

TEACHERS' COURSE

*307. Coördination of Teaching of Mathematics. (2) I and II.

Group discussion.

Mrs. McDonald

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201A-201B. Function Theory. (3-3) Yr.

Mr. Evans

Prerequisite: courses 111A, 119A-119B.

Point sets in Euclidean space, measure, generalizations of integral including Lebesgue and Lebesgue-Stieltjes integrals; classical theorems on the complex variables; application of real variable theory to complex variable.

Students with facility for mathematics may well take this course in the senior, undergraduate year. It includes the material of course 150A-150B.

205A-205B. Theory of Functions of a Complex Variable. (3-3) Yr.

Prerequisite: course 201A-201B.

Mr. Garabedian

The theory of analytic functions and topics such as meromorphic functions, entire functions, modular functions, and Abelian integrals, analytic theory of differential equations, inequalities, etc., at the pleasure of the instructor.

210A-210B. Theory of Functions of a Real Variable. (3-3) Yr. Mr. Morse

Prerequisite: course 201A-201B.

Measure theory, metric spaces, topics such as functional analysis, calculus of variations, partial differential equations, potential theory, transfinite processes, expansions, according to the pleasure of the instructor.

215A-215B. Topology. (3-3) Yr.

Mr. Diliberto

Convergence, compactness, completeness, function space topologies and metrization. Connectedness, local connectedness, the fundamental group, homology theories, duality and fixed point theorems.

220A-220B. Differential Equations. (3-3) Yr.

Mr. Buck

General theories, topics in ordinary and partial differential equations, boundary value problems. This course presupposes some knowledge of complex and real variable theory.

* Not to be given, 1949-1950.

- 225A-225B. Introduction to Metamathematics. (3-3) Yr. Mr. Tarski
Prerequisite: courses 109A-109B, 111A-111B.
Formalized mathematical theories. Symbols, concatenation, formulas, sentences, derivability, axiomatic basis. Consistency and completeness. Notions of model and consequence—their relations to consistency and derivability. Application to formalized number theory. Truth and provability—their mutual relations. Introduction to the decision problem.
- 230A-230B. Algebraic Geometry. (3-3) Yr. Mr. Seidenberg
Theory of algebraic functions. Algebraic varieties; in particular, algebraic curves. Bezout's theorem. Branches of a curve. Linear series. Theorem of Riemann-Roch. Emphasis will be on algebraic methods.
- 240A-240B. Differential Geometry. (3-3) Yr. Mr. Lewy
Differential geometry with tensor analysis. Intrinsic geometry of surfaces. Parallel displacement of Levi Civita. Riemannian geometry of n -dimensions. Non-Riemannian geometry of Weyl and others.
- 250A-250B. Algebra. (3-3) Yr. Mr. Tarski
Prerequisite: courses 109A-109B, 111A-111B.
Algebra of sets and relations; groups, rings, fields; applications of general algebraic notions (isomorphism, homomorphism, subalgebras, direct products).
- 265A-265B. Advanced Probability. (3-3) Yr. (See Statistics, below.)
270. Technical Hydrodynamics. (3) II.
Theoretical analyses of motion of frictionless and viscous fluids, flow of compressible fluids at sub- and supersonic velocities.
290. Seminars. (2-6) I and II. The Staff (Mr. Evans in charge)
Topics in foundations of mathematics, theory of numbers, numerical calculation, analysis, geometry, algebra, probability and theory of statistics, and in their applications, by means of lectures and informal conferences; work based largely on original memoirs. During 1949-1950 there will be, in particular, lecture seminars on the following subjects, in charge of the persons indicated:
(a) Selected topics in the foundations of mathematics, I, II, Mr. Bernstein; (c) Mathematics of quantum mechanics, I, II, Mr. Wolf; (e) Topics in algebra and metamathematics, I, II, Mr. Tarski; (g) Potential theory, I, II, Mr. Evans; (h) Arithmetical properties of modular forms, I, II, Mr. Lehmer; (j) Topics in invariant theory, I, II, Mr. Foster; (k) Topological groups, I, II, Mr. Kelley.
295. Individual Research Leading to Higher Degree. (2-6) I and II.
The Staff (Mr. Evans in charge)
- Mathematical Colloquium. No credit. I and II. The Staff
Meetings for the presentation of original work by members of the staff and graduate students.

Statistics

LOWER DIVISION COURSE

12. Elements of Probability and Statistics. (3) I and II.
Prerequisite: course D. Mr. Lehmann, Mr. Loève, Mr. Mann
For students wishing to specialize in statistics as well as for those wishing to acquire basic concepts for general education. Relative frequency. Discrete probability. Testing statistical hypotheses. Illustrations from genetics, bacteriology, industrial sampling and public health.

UPPER DIVISION COURSES

113. Second Course in Probability and Statistics. (3) I and II.
Mr. Mann, Mr. Barankin
Prerequisite: course 3A-3B or 11A-11B, and course 12.
Continuation of course 12. Expectation, variance, correlation, regression. Mathematical law of large numbers. Simple examples of least squares estimates. Basic ideas of confidence intervals. Applications.
- 120A-120B. Theory of Probability and Statistics. (3-3) Yr.
Mr. Lehmann, Mr. Hodges
Prerequisite: courses 4A-4B, 150A-150B (may be taken concurrently), and 113. It is recommended that 120C-120D be taken concurrently.
Continuation of course 113. Markoff theorem. Theorem of Laplace. Order statistics. Lambda criterion and maximum likelihood estimates. Continuous probability laws. Analysis of variance. Applications.
- 120C-120D. Laboratory Course in Theory of Probability and Statistics. (1-1) Yr.
Mr. Lehmann, Mr. Hodges, Mr. Nash
May be taken in conjunction with course 120A-120B.
- *128. Numerical Analysis. (3) II. (See Mathematics, above.)
- 130A-130B. Statistical Inference. (3-3) Yr.
Miss Scott
Prerequisite: course 3A-3B or 11A-11B. It is recommended that 130C-130D be taken concurrently.
The basic concepts and principal tools of probability theory, hypothesis testing, and estimation, presented for students of natural and social sciences and engineering. While the conceptual and applicational aspects are treated carefully, the more difficult mathematical theorems are stated without proof. Not open for credit to students who have taken 120A-120B.
- 130C-130D. Laboratory Course in Statistical Inference. (1-1) Yr.
Miss Scott
May be taken in conjunction with course 130A-130B.
132. Descriptive Statistics. (3) II.
Mr. Jeeves
Lectures and laboratory.
Prerequisite: course 113 or 130A; and course 4A-4B, or grade of at least B in course 3A-3B or 11A-11B.
Collective and individual characters. Mathematical statistics as theory of collective characters. Means. Measures of dispersion. Frequency curves. Moments. Sheppard's corrections. Pearson curves. Curves of Charlier. Methods of fitting. Stochastic explanation of various distributions. Multivariate distributions. Static regressions and correlations. Applications.
- 142A-142B. Life Contingencies. (3-3) Yr.
Mr. Peters
Prerequisite: courses 12 and 113 or 130A-130C. It is recommended that 142C-142D be taken concurrently.
Mortality tables and related functions. Laws of mortality. Annuities and assurances for one and more than one life. Policy reserves. Return of premiums. Rule of uniform seniority. Disability insurance. Some statistical applications of the mortality table. Survey of mortality tables.
- 142C-142D. Laboratory Course in Life Contingencies. (1-1) Yr. Mr. Peters
May be taken in conjunction with course 142A-142B.
- *144. Population Statistics. (3) II.
Mr. Peters
Prerequisite: courses 12 and 3A, or 130A.
Collection of data. Intercensal and postcensal populations. Formulas for mortality tables. Incompleteness of population data. Incompleteness of birth and death registrations. Infantile death rates. Errors in age. Construction of mortality tables.

* Not to be given, 1949-1950.

165A-165B. Probability Theory and Its Analytic Basis. (3-3) Yr. Mr. Loève

Prerequisite: course 150A-150B.

Lebesgue-Stieltjes integral. Axiomatic foundations of probability. Conditional probability and expectation. Fourier transform. Central limit theorem.

GRADUATE COURSES

Courses 261, 263, 264, and 266 are intended to introduce the student to practical work in various fields of application. In addition to the four hours of supervised practical work connected with these courses the students attending them will be able to use the laboratory at other times as well.

Students who are doing research problems in experimental sciences may register in courses 261, 263, 264, and 266 without the specified prerequisite, with the permission of the instructor.

The laboratory will be open to graduate students for research.

260A-260B. Advanced Topics in Probability and Statistics. (3-3) Yr.

Mr. Neyman, Mr. Lehmann

Prerequisite: courses 111A, 120A-120B, and 150A-150B. Course 165A or 185 or 201A-201B is prerequisite to 260B.

Continuation of course 120. Early principles of statistical tests. Testing simple hypotheses. Best similar and best invariant tests of composite hypotheses. Linear hypothesis. Confidence intervals. Introduction to multivariate statistical analysis. Sequential and nonparametric statistical analysis. Theory of point estimation. It is recommended that 260C-260D be taken concurrently.

260C-260D. Laboratory Course in Advanced Topics in Probability and Statistics. (2-2) Yr.

Mr. Neyman, Mr. Lehmann, Mr. Hughes

May be taken in conjunction with course 260A-260B.

261. Statistical Problems in Experimentation. (3) I.

Lectures and laboratory.

Mr. Mann and Assistant

Prerequisite: course 130A-130B or 12 and 113.

Mathematical models of experimental problems; random and systematic designs; complex experiments; randomized blocks; Latin and Graeco-Latin squares; biological assay; recent developments in the theory of experimental design.

263. Statistical Studies of Risks. (3) I.

Miss Fix

Lectures and laboratory.

Prerequisite: course 130A-130B or 12 and 113.

Life and sickness tables. Standard error of a table. Law of Gompertz-Makeham. Standardization of rates of risk. Epidemiological and medical statistics. Theory of growth. Simple random processes explaining various population phenomena. Problems of social and commercial insurance.

264. Statistical Problems of Mass Production and Control of Quality. (3) II.

Lectures and laboratory.

Mr. Lehmann, Mr. Hughes

Prerequisite: course 12 or 130A.

Variability in manufactured products. Controlled accuracy of analyses and controlled variability of manufactured products. Sampling designed to protect interests of manufacturer and of consumer. Estimation of percentage defective. Identification of causes of defects.

265A-265B. Advanced Probability. (3-3) Yr. Mr. Barankin, Mr. Loève

Prerequisite: course 185 or 201A-201B. Beginning in the fall semester, 1950, course 165A-165B will be prerequisite.

Students familiar with the contents of course 120 are likely to appreciate more the various points discussed in course 265A.

Probability laws and their general properties. Mean values. Characteristic functions. Convergence "in probability." Normal distribution and

central limit theorem. Liapounoff's theorem. Markoff chains and random processes. Applications to physics and biology. Theorems of S. Bernstein and Kozakiewicz.

266. Sampling Surveys. (3) II. Mr. Kuznets and Assistant
Prerequisite: Mathematics 12 or 130A; 120A-120B recommended but not a prerequisite; or special permission of instructor.
Mathematical theory of sampling. Best linear unbiased estimates and their variances. Sampling methods: unrestrictedly random, stratified and double sampling methods of Friedman-Wilcox.
267. Advanced Theory of the χ^2 Test. (3) II. Mr. Barankin
Prerequisite: course 260A.
Generalized theorem of Laplace. Tests equivalent in the limit. Various aspects of the χ^2 test. Best asymptotically normal estimates.
- 269A-269B. Recent Developments in the Theory of Statistics. (3-3) Yr.
Mr. Barankin, Mr. Mann
Prerequisite: courses 111A, 120A-120B, and 201A-201B or 185. Course 269A is not prerequisite to 269B.
Recent developments in the theory of statistics. Optimum tests with particular reference to multivariate and nonparametric problems. General theory of sequential analysis.
- 280A-280B. Advanced Statistical Inference. (3-3) Yr.
Prerequisite: course 130A-130B. Mr. Hodges, Mr. Lehmann
Continuation of 130A-130B. Generally parallels the material in course 260A-260B, without complicated mathematical proofs. It is recommended that 280C-280D be taken concurrently. Not open for credit to students who have taken 260A-260B.
- 280C-280D. Laboratory Course in Advanced Statistical Inference. (2-2) Yr.
Mr. Hodges, Mr. Lehmann, Mr. Jeeves
May be taken in conjunction with course 280A-280B.
- 290S. Statistical Seminar. (2-6) I and II. Mr. Neyman, Mr. Loève in charge
- 295S. Individual Research Leading to Higher Degree. (2-6) I and II.
Mr. Neyman, Mr. Loève, Mr. Mann

MEDICO-MILITARY SCIENCE AND TACTICS

A Division of the Medical School

DANIEL J. BERRY, Colonel, Medical Corps, Commandant ASU 6817; Associate Clinical Professor of Medico-Military Science and Tactics (Chairman of the Division).

Letters and Science List.—Course 121A-121B is included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

The work of this division consists of a four-year progressive course divided into periods of two years each. An elementary course for first- and second-year medical students, and an advanced course for third- and fourth-year medical students. The first year is taught at Berkeley; the second, third, and fourth years at the Medical School in San Francisco. All courses are elective.

- 121A-121B. Elementary Medico-Military Science and Tactics (First Year).
(1-1) Yr. Mr. Berry
Lectures and demonstrations.

MILITARY SCIENCE AND TACTICS

- HAROLD P. DETWILER, Colonel, Coast Artillery Corps; Professor of Military Science and Tactics (Chairman of the Department).
- MARION C. DORNEY, Lieutenant Colonel, Ordnance Department; Associate Professor of Military Science and Tactics.
- WILLIAM E. HELTZEL, Lieutenant Colonel, Signal Corps; Associate Professor of Military Science and Tactics.
- THOMAS L. LAWLOR, Lieutenant Colonel, Infantry; Associate Professor of Military Science and Tactics.
- CLARENCE O. OLSON, Lieutenant Colonel, Quartermaster Corps; Associate Professor of Military Science and Tactics.
- JAMES D. STRONG, Lieutenant Colonel, Corps of Engineers; Associate Professor of Military Science and Tactics.
- ALBERT C. WILLIAMS, Lieutenant Colonel, Coast Artillery Corps; Associate Professor of Military Science and Tactics.
- THOMAS E. BENNETT, Major, Infantry; Associate Professor of Military Science and Tactics.
- DARREL G. COSTELLO, Major, Infantry; Associate Professor of Military Science and Tactics.
- DON O. CURRIER, Major, Corps of Military Police; Associate Professor of Military Science and Tactics.
- HOWARD G. FORD, Major, Corps of Military Police; Associate Professor of Military Science and Tactics.
- THOMAS F. GORDON, Major, Coast Artillery Corps; Associate Professor of Military Science and Tactics.
- JOHN P. A. KELLY, Major, Coast Artillery Corps, Associate Professor of Military Science and Tactics.
- WILLIAM R. MATTISON, Major, Signal Corps; Associate Professor of Military Science and Tactics.
- OSCAR L. MYERS, Major, Infantry; Associate Professor of Military Science and Tactics.
- STEPHEN V. RALPH, Major, Infantry; Associate Professor of Military Science and Tactics.
- RUSSELL B. SIMPSON, Major, Infantry; Associate Professor of Military Science and Tactics.
- GERALD J. TISON, Major, Coast Artillery Corps; Associate Professor of Military Science and Tactics.
- WILLIAM B. WOOTTON, JR., Major, Infantry; Associate Professor of Military Science and Tactics.
- JOHN P. YOUENS, Major, Transportation Corps; Associate Professor of Military Science and Tactics.
- CURTIS H. ALLOWAY, Captain, Infantry; Assistant Professor of Military Science and Tactics.
- THOMAS E. GRIESS, Captain, Corps of Engineers; Assistant Professor of Military Science and Tactics.
- WINFRED L. HASTY, JR., Captain, Quartermaster Corps; Assistant Professor of Military Science and Tactics.
- NORMAN E. MEYER, Captain, Transportation Corps; Assistant Professor of Military Science and Tactics.
- EUGENE L. NOREEN, Captain, Infantry; Assistant Professor of Military Science and Tactics.
- GILBERT M. VICK, Captain, Ordnance Department; Assistant Professor of Military Science and Tactics.

Letters and Science List.—Not more than 8 units of lower division courses in military science may be included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

LOWER DIVISION COURSES

The lower division or basic courses are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States, able-bodied, and under twenty-four years of age at the time of initial enrollment in the basic course. A first-year or second-year student claiming exemption because of noncitizenship, physical disability, age, or prior military service will present to the Registrar a petition on the prescribed form, for such exemption. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work thereof. These courses consist of four hours of formal instruction per week for two academic years. The instruction prescribed for the first year of the basic course is of a general type, applicable to the Army as a whole. It is not specialized by arm or service. During the second year students may elect to pursue a specialized course of a general introductory nature in one of the eight branches of the Army which are established in the Department of Military Science and Tactics. Uniforms provided by the government are issued to all students of the basic course. The uniform is required to be returned in good condition on completion of the course and students are held liable for the loss of any articles of the uniform.

- 1A. Basic (First Year). (2) I. The Staff
 (Formerly numbered 10A.)
 Leadership, drill, and exercise of command; military policy of the United States; National Defense Act and R.O.T.C.; military organization; military mobilization and demobilization; military psychology and personnel management; the geographical foundations of national power.
- 1B. Basic (First Year). (2) II. The Staff
 (Formerly numbered 10B.)
 Leadership, drill, and exercise of command; maps and aerial photographs; first aid and hygiene; the evolution of warfare; military problems of the United States.
- 20A. Basic (Second Year). Infantry. (2) I. The Staff (Mr. Lawlor in charge)
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; organization; weapons and marksmanship—rifle cal. 30, machine gun cal. 30, automatic rifle cal. 30, carbine, rocket launcher and grenades.
- 20B. Basic (Second Year). Infantry. (2) II. The Staff (Mr. Lawlor in charge)
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; weapons and marksmanship; technique of fire of rifle squad; combat formations; scouting and patrolling; tactics of rifle squad.
- 22A. Basic (Second Year). Corps of Engineers. (2) I. Mr. Strong
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; characteristics of weapons; organization and tactics of small units; organization of the ground and field fortifications.

- 22B. Basic (Second Year). Corps of Engineers. (2) II. Mr. Griess
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; camouflage; explosives and demolitions; mines and booby traps; hand tools and rigging.
- 23A. Basic (Second Year). Signal Corps. (2) I. Mr. Heltzel
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; introduction to signal communications in the United States Army.
- 23B. Basic (Second Year). Signal Corps. (2) II. Mr. Mattison
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; organization and missions of the Signal Corps; organization and signal communications practices of the infantry, armored, and air-borne divisions.
- 24A. Basic (Second Year). Coast Artillery Corps. (2) I.
The Staff (Mr. Williams in charge)
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; introduction to AA automatic weapons; characteristics and limitations of AA automatic weapons; service of the piece AA automatic weapons; functioning and nomenclature of M1 rifle.
- 24B. Basic (Second Year). Coast Artillery Corps. (2) II.
The Staff (Mr. Williams in charge)
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; principles of radar; introduction to AA guns; characteristics and limitations of AA guns; service of the place AA guns.
- 25A. Basic (Second Year). Ordnance Department. (2) I. Mr. Dorney
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; the role of ordnance; ammunition matériel; automotive matériel.
- 25B. Basic (Second Year). Ordnance Department. (2) II. Mr. Dorney
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; small arms matériel; artillery matériel; fire control matériel.
- 26A. Basic (Second Year). Quartermaster Corps. (2) I. Mr. Olson
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; property accountability and responsibility; unit and organization supply; research and development of supply in the Quartermaster Corps.
- 26B. Basic (Second Year). Quartermaster Corps. (2) II. Mr. Olson
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; organization for supply in the army; organization and functions of the Quartermaster Corps; organization, functions and operation of quartermaster units; classification of supplies.
- 27A. Basic (Second Year). Transportation Corps. (2) I. Mr. Youens
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; functions and mission of the Transportation Corps; economics of military transportation.

- 27B. Basic (Second Year). Transportation Corps. (2) II. Mr. Youens
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; organization; operation;
 military utilization of highway transport facilities.
- 28A. Basic (Second Year). Corps of Military Police. (2) I. Mr. Currier
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; history of the Corps of
 Military Police; military courtesy and customs; military police conduct
 and authority; military police organizations and functions; motor trans-
 portation; communications; control of individuals in the field.
- 28B. Basic (Second Year). Corps of Military Police. (2) II. Mr. Currier
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; military mapping and
 sketching; military law; individual weapons to include characteristics and
 operation.

UPPER DIVISION COURSES

Infantry, Corps of Engineers, Signal Corps, Coast Artillery Corps, Ordnance, Quartermaster Corps, Transportation Corps, and Corps of Military Police Units.

Students who successfully complete the basic course or who have received credit in lieu thereof may apply for enrollment in the advanced course. In general, students selected for this course are those who have shown potentialities for leadership and command, and whose aptitude insures their develop-
 ing into efficient officer material.

The advanced course consists of five hours of formal instruction per week for two academic years, and is principally specialized in the arm or service elected by the student. It includes a summer camp of six weeks duration, held between the two academic years of the advanced course. The number enrolled in the advanced course may vary from year to year and is dependent upon the quota allotted annually. For admission to the upper division or advanced courses, students must:

1. Be citizens of the United States and be regularly enrolled in the University of California.
2. Not have reached 27 years of age at the time of initial enrollment in the advanced course.
3. Be selected by the Professor of Military Science and Tactics and the President of the University.
4. Successfully complete such survey and screening tests as may be prescribed.
5. Execute a written agreement with the government to complete the two-year advanced course, including attendance at summer camp.
6. Pass successfully a prescribed physical examination.

Within quota limitations, qualified students eligible for enrollment in the advanced course will be free to choose the arm or service of their choice. They must be enrolled in an academic field prescribed by the Army if admission to a unit of a technical service is desired.

An officer-type uniform is furnished the student which becomes his personal property upon successful completion of the advanced course. Each student receives during the two-year period a monthly monetary allowance at a daily rate equal to the value of the commuted ration, as announced by the Department of the Army. Students attending the Advanced Course Summer Camp will receive pay at the rate of \$75 per month, railroad fare to and from camp, quarters, clothing and uniforms, meals, and medical services. Acceptance by the students of the monetary allowances listed above will make the completion of the advanced course a prerequisite to graduating from the University.

Any emoluments mentioned above are in addition to benefits received through the provisions of Public Law 346, provided the ceiling as limited by law on total income is not exceeded.

Successful completion of the advanced R.O.T.C. course, and four years of education at the college level, qualifies the student for appointment and commission by the President as a Second Lieutenant in the Army of the United States. Students who complete the advanced course are also eligible to be commissioned by the Governor of the State of California in the University Cadets.

Those students who have successfully completed the advanced R.O.T.C. course, and who have been selected by the Professor of Military Science and Tactics and the President of the University for scholastic excellence, may be designated as "Distinguished Military Graduates." Such Distinguished Graduates are considered for direct commission in the Regular Army, if they are eligible for appointment under the pertinent laws.

For further information about the Reserve Officers Training Corps, consult the Professor of Military Science and Tactics in Room 149, Gymnasium for Men.

- 130A. Advanced Infantry (First Year). (3) I. Mr. Wootton
(Formerly numbered 106A.)
Prerequisite: successful completion of courses 20A, 20B, or their equivalent.
Leadership, drill, and exercise of command; organization and equipment of the Infantry, with emphasis on the battalion; description, characteristics, and functioning of infantry weapons with emphasis on the machine gun; rifle marksmanship to include range firing; gunnery with infantry weapons.
- 130B. Advanced Infantry (First Year). (3) II. Mr. Wootton
(Formerly numbered 106B.)
Prerequisite: successful completion of courses 20A, 20B, or their equivalent.
Leadership, drill, and exercise of command; communications within the infantry battalion; hasty field fortifications; combat intelligence; estimate of the situation and combat orders; tactics of the rifle and heavy weapons, platoons and companies.
- 132A. Advanced Corps of Engineers (First Year). (3) I. Mr. Griess
(Formerly numbered 126A.)
Prerequisite: successful completion of courses 22A, 22B, or their equivalent.
Leadership, drill, and exercise of command; organization of engineer units and combat divisions; engineer supply; military roads and runways; engineer signal communications; individual weapons and marksmanship.
- 132B. Advanced Corps of Engineers (First Year). (3) II. Mr. Strong
(Formerly numbered 126B.)
Prerequisite: successful completion of courses 22A, 22B, or their equivalent.
Leadership, drill, and exercise of command; tactics of engineer units; engineer combat intelligence; water supply; bridge design and classification.
- 133A. Advanced Signal Corps (First Year). (3) I. Mr. Mattison
(Formerly numbered 136A.)
Prerequisite: successful completion of courses 23A, 23B, or their equivalent.
Leadership, drill, and exercise of command; the fundamentals of field wire and radio communications; individual weapons and marksmanship.

- 133B. Advanced Signal Corps (First Year). (3) II. Mr. Mattison
(Formerly numbered 136B.)
Prerequisite: successful completion of courses 23A, 23B, or their equivalent.
Leadership, drill, and exercise of command; applied signal communications; communications security, signal supply and repair; signal orders; message center and communications center procedures.
- 134A. Advanced Coast Artillery (AA) (First Year). (3) I. Mr. Gordon
(Formerly numbered 146A.)
Prerequisite: successful completion of courses 24A, 24B, or their equivalent.
Leadership, drill, and exercise of command; organization of coast artillery AA; basic AA gunnery; marksmanship to include function of carbine, pistol and submachine gun.
- 134B. Advanced Coast Artillery (AA) (First Year). (3) II. Mr. Gordon
(Formerly numbered 146B.)
Prerequisite: successful completion of courses 24A, 24B, or their equivalent.
Leadership, drill, and exercise of command; communications; troop movement; AA automatic weapons gunnery; AA tactics; motors and transportation.
- 135A. Advanced Ordnance (First Year). (3) I. Mr. Dorney
(Formerly numbered 156A.)
Prerequisite: successful completion of courses 25A, 25B, or their equivalent.
Leadership, drill, and exercise of command; functional organization of the Ordnance Department; ammunition matériel; ammunition supply; individual weapons and marksmanship.
- 135B. Advanced Ordnance (First Year). (3) II. Mr. Dorney
(Formerly numbered 156B.)
Prerequisite: successful completion of courses 25A, 25B, or their equivalent.
Leadership, drill, and exercise of command; artillery matériel; fire control; matériel; automotive matériel; individual weapons and marksmanship.
- 136A. Advanced Quartermaster Corps (First Year). (3) I. Mr. Olson
(Formerly numbered 166A.)
Prerequisite: successful completion of courses 26A, 26B, or their equivalent.
Leadership, drill, and exercise of command; individual weapons and marksmanship; station supply; depot supply; salvage operations and procedures.
- 136B. Advanced Quartermaster Corps (First Year). (3) II. Mr. Olson
(Formerly numbered 166B.)
Prerequisite: successful completion of courses 26A, 26B, or their equivalent.
Leadership, drill, and exercise of command; storage, warehousing and materials handling; commissary operations; garrison and field bakery operations; post and field laundry operations; food service activities; maintenance and reclamation of quartermaster supplies; procurement, storage and distribution of petroleum products; Graves Registration and mortuary activities.

- 137A. Advanced Transportation Corps (First Year). (3) I. Mr. Youens
(Formerly numbered 176A.)
Prerequisite: successful completion of courses 27A, 27B, or their equivalent.
Leadership, drill, and exercise of command; military traffic management; army port operations; organization of Transportation Corps staff sections at various levels of command; study of individual weapons and marksmanship.
- 137B. Advanced Transportation Corps (First Year). (3) II. Mr. Youens
(Formerly numbered 176B.)
Prerequisite: successful completion of courses 27A, 27B, or their equivalent.
Leadership, drill, and exercise of command; railroad organization and operation (civilian and military); stevedoring; harborcraft and marine maintenance; highway operations in overseas theaters.
- 138A. Advanced Corps of Military Police (First Year). (3) I. Mr. Currier
(Formerly numbered 186A.)
Prerequisite: successful completion of courses 28A, 28B, or their equivalent.
Leadership, drill, and exercise of command; individual weapons and marksmanship; criminal investigation I; domestic disturbances; guard-houses and confinement facilities.
- 138B. Advanced Corps of Military Police (First Year). (3) II. Mr. Currier
(Formerly numbered 186B.)
Prerequisite: successful completion of courses 28A, 28B, or their equivalent.
Leadership, drill, and exercise of command; protection of vital installations; prisoners of war; town patrolling; traffic control I; individual weapons and marksmanship.
- 140A. Advanced Infantry (Second Year). (3) I. Mr. Lawlor
(Formerly numbered 107A.)
Prerequisite: courses 130A and 130B.
Leadership, drill, and exercise of command; organization; command and staff; military administration; psychological warfare; military teaching methods; new developments; motors and transportation.
- 140B. Advanced Infantry (Second Year). (3) II. Mr. Lawlor
(Formerly numbered 107B.)
Prerequisite: courses 130A and 130B.
Leadership, drill, and exercise of command; supply and evacuation; troop movements; the military team; tactics—"The Infantry Battalion in the Attack and Defense"; military law.
- 142A. Advanced Corps of Engineers (Second Year). (3) I. Mr. Strong
(Formerly numbered 127A.)
Prerequisite: courses 132A and 132B.
Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; command and staff; motor movements; engineer support for army; communications zone.
- 142B. Advanced Corps of Engineers (Second Year). (3) II. Mr. Griess
(Formerly numbered 127B.)
Prerequisite: courses 132A and 132B.
Leadership, drill, and exercise of command; military law and boards; engineer support for air forces; river-crossing operations; construction, utilities and job management.

- 143A. Advanced Signal Corps (Second Year). (3) I. Mr. Heltzel
 (Formerly numbered 137A.)
 Prerequisite: courses 133A and 133B.
 Leadership, drill, and exercise of command; wire and radio communication matériel; military teaching methods and administration.
- 143B. Advanced Signal Corps (Second Year). (3) II. Mr. Heltzel
 (Formerly numbered 137B.)
 Prerequisite: courses 133A and 133B.
 Leadership, drill, and exercise of command; higher echelon signal communications and equipment; radio communications matériel; darkroom techniques and photographic practices; command and staff; post signal operations and administrative procedures; military law.
- 144A. Advanced Coast Artillery (AA) (Second Year). (3) I. Mr. Williams
 (Formerly numbered 147A.)
 Prerequisite: courses 134A and 134B.
 Leadership, drill, and exercise of command; military teaching methods and administration; psychological warfare; AA tactics, advanced; AA gunnery; supply and evacuation.
- 144B. Advanced Coast Artillery (AA) (Second Year). (3) II. Mr. Williams
 (Formerly numbered 147B.)
 Prerequisite: courses 134A and 134B.
 Leadership, drill, and exercise of command; military law; AA matériel; military team; command and staff; new developments; combat intelligence; field artillery capabilities and employment.
- 145A. Advanced Ordnance (Second Year). (3) I. Mr. Vick
 (Formerly numbered 157A.)
 Prerequisite: courses 135A and 135B.
 Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; maintenance and supply; command and staff procedures; combat intelligence.
- 145B. Advanced Ordnance (Second Year). (3) II. Mr. Vick
 (Formerly numbered 157B.)
 Prerequisite: courses 135A and 135B.
 Leadership, drill, and exercise of command; military law and boards; matériel specialty.
- 146A. Advanced Quartermaster Corps (Second Year). (3) I. Mr. Hasty
 (Formerly numbered 167A.)
 Prerequisite: courses 136A and 136B.
 Leadership, drill, and exercise of command; military administration; military teaching methods; psychological warfare; quartermaster operations in the zone of the interior; quartermaster operations in the theater of operations.
- 146B. Advanced Quartermaster Corps (Second Year). (3) II. Mr. Hasty
 (Formerly numbered 167B.)
 Prerequisite: courses 136A and 136B.
 Leadership, drill, and exercise of command; military law and boards; organization and functions of the combatant arms; organization and functions of the technical services; fiscal procedures; procurement procedures; command and staff; technical intelligence; combat intelligence.
- 147A. Advanced Transportation Corps (Second Year). (3) I. Mr. Meyer
 (Formerly numbered 177A.)
 Prerequisite: courses 137A and 137B.
 Leadership, drill, and exercise of command; rail operations in theaters of operations; logistics and overseas supply; military administration; teaching methods.

- 147B. Advanced Transportation Corps (Second Year). (3) II. Mr. Meyer
(Formerly numbered 177B.)
Prerequisite: courses 137A and 137B.
Leadership, drill, and exercise of command; advanced military traffic management and highway activities in theaters of operations; command and staff functions; military law.
- 148A. Advanced Corps of Military Police (Second Year). (3) I. Mr. Ford
(Formerly numbered 187A.)
Prerequisite: courses 138A and 138B.
Leadership, drill, and exercise of command; military administration; psychological warfare; military teaching methods; criminal investigation II; train and town patrol; traffic control II.
- 148B. Advanced Corps of Military Police (Second Year). (3) II. Mr. Ford
(Formerly numbered 187B.)
Prerequisite: courses 138A and 138B.
Leadership, drill, and exercise of command; military law and boards; principles of police administration; command and staff; the military team; supply and evacuation; military executions; military government; military police problems in theaters of operations; combat intelligence.

MUSIC

- ERNEST BLOCH, Professor of Music (Summer Sessions only).
MANFRED F. BUKOFZER, Ph.D., Professor of Music.
CHARLES C. CUSHING, M.A., Professor of Music.
ALBERT I. ELKUS, M.L., Professor of Music (Chairman of the Department).
ROGER SESSIONS, A.B., Mus.B., Professor of Music.
EDWARD G. STRICKLEN, Professor of Music, Emeritus.
DAVID D. BOYDEN, M.A., Associate Professor of Music.
EDWARD B. LAWTON, JR., A.B., Associate Professor of Music.
WILLIAM D. DENNY, M.A., Assistant Professor of Music.
*WINIFRED B. HOWE, M.A., Assistant Professor of Music.
ANDREW W. IMBRIE, M.A., Instructor in Music.
FRANKLIN CARTER, Associate in Music and Lecturer in Musical Education.
MARY GROOM JONES, Associate in Music.
ERNEST KUBITSCHKEK, Associate in Music.
HERMAN C. TRUTNER, III, Associate in Music.



² THE GRILLER QUARTET of the University of California:

- SIDNEY GRILLER, F.R.A.M.;
JACK O'BRIEN, L.R.A.M.;
PHILIP BURTON, F.R.A.M.;
COLIN HAMPTON, F.R.A.M.



- PETER F. ABRAHAM, A.B., Lecturer in Music.
MADI BACON, M.A., Lecturer in Music.
VINCENT H. DUCKLES, A.B., M.A., Ed.D., Lecturer in Music Bibliography.
WILLIAM E. KNUTH, M.A., Ed.D., Lecturer in Music.
REGINALD KRIEGER, A.B., Lecturer in Music for the spring semester.

* Absent on leave, 1949-1950.

² In residence spring semester only, 1949-1950.

WALTER L. NOLLNER, M.A., Lecturer in Music.
 MARJORIE GEAR PETRAY, A.B., Lecturer in Music.
 EDGAR H. SPARKS, M.A., Lecturer in Music.

Letters and Science List.—All undergraduate courses are included in the Letters and Science List of Courses; a total of not more than 8 units from courses 25, 55, 125, and 155 will be accepted as Letters and Science credit. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. DENNY.

Preparation for the Major.—Required: Freshman year: Music A, B, 1, 2; Sophomore year: Music C, 4A-4B, 30A-30B. Entering students who plan to major in music should confer with Mr. Sparks or Mr. Lawton. The major in music presupposes ability in piano playing; an advisory examination in piano, required of all entering students, will be given by the department at the beginning of each semester. Instruction in piano, organ, violin, and voice is offered by University Extension.

The Griller Quartet will be available during the spring semester, in the department and in University Extension, for instruction in the performance of chamber music.

Undergraduate students transferring from other colleges should consult with a departmental major adviser before enrolling in any music course.

The Major.—The courses applicable to the major are arranged in three groups. The *Theory* courses provide an introduction to the materials of musical composition through analysis of representative musical works and practical exercises in the technique. The *History and Literature* courses provide a study of musical literature and the chief periods of its development. The *Performance* courses provide an opportunity to gain familiarity with musical literature through performance.

The 24 units required for the major are to be distributed among upper division courses according to the following plan:

I. *Theory.*—At least two of the following courses: 101, 102, 105A, 105B, 106A, 106B, either 107A or 107B, 108, 109.

II. *History and Literature.*—At least two of the following semester courses: 116, 117, 118, 119, either 120A or 120B, 122A, 122B.

III. *Performance.*—At least two of the following courses: 125, 135, 155, 165, 175, 185. Each of these courses may be repeated once without duplication of credit. The requirement may be satisfied by repeating the same course.

IV. Course 100A-100B.

Students are advised to acquire facility in reading French, German, or Italian. In addition, the department recommends as supplementary choices among free electives: Philosophy 136A-136B and other related courses in the fields of anthropology, architecture, art, English, history, philosophy, speech, and foreign literature.

Students who fail to maintain an average of one grade point for each unit of work undertaken in the upper division in the Department of Music will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in music.

Honors Students in the Upper Division.—Students in the honors group who have completed the major in music with distinction may receive honors at graduation.

Teacher-Training.—Adviser: Mr. Cushing. Candidates for the General Secondary Credential, after receiving the A.B. degree, must spend two graduate semesters at this University; the teaching major, normally completed by the end of this period, specifically requires: (a) Two courses chosen from 101, 102, 107A, or 107B. (b) Courses 108, 300A-300B, 409, 435A-435B. (c) Four units chosen from 125, 135, 155, 165, 175, two units of which must be in 135. Only one unit of 155 may apply. (d) Ability in piano and competence in either

voice or one orchestral or band instrument, and four units from 328, 329A, 329B, 329C. Students without previous experience in playing an orchestral or band instrument are urged to undertake work in the 329 courses as soon as possible, preferably in the lower division. Credit of 3 units in the teaching methods courses will satisfy the requirement of elective units in education. For further information, including grade-point requirements, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Higher Degrees.—Advisers: M.A. degree, Mr. Boyden; Ph.D. degree, Mr. Bukofzer. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION and the special announcements issued by the department concerning the M.A. and Ph.D. degrees.

LOWER DIVISION COURSES

Theory

- A. Musicianship. (2) I. Mr. Imbrie, Mr. Sparks (in charge)
Elements of music, with ear training and sight singing.
- B. Musicianship. (2) II. Mr. Imbrie, Mr. Sparks (in charge)
A continuation of course A, which is prerequisite.
- C. Musicianship. (2) I and II. Mrs. Petray
A continuation of course B, which is prerequisite.
1. Elementary Counterpoint. (3) I.
Mr. Abraham, Mr. Cushing, Mr. Imbrie, Mr. Nollner,
Mr. Sparks (in charge)
Prerequisite: course A (may be taken concurrently). One section will be offered for students who do not plan to major in music.
Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.
2. Elementary Harmony. (3) II.
Mr. Abraham, Mr. Imbrie, Mr. Nollner, Mr. Sparks (in charge)
Prerequisite: course 1; course B (may be taken concurrently). One section will be offered for students who do not plan to major in music.
- 4A-4B. Intermediate Harmony. (3-3) Yr. Mr. Imbrie, ——
Prerequisite: course 2.

History and Literature

- 27A-27B. Introduction to Musical Literature. (3-3) Yr. Mr. Elkus
Two lectures and one section meeting weekly.
Lectures, illustrations, and readings designed to furnish a general appreciation of music. Weekly section meetings for listening, discussions, and written work. Intended primarily for students whose major is not music.
- 30A-30B. History and Literature of Music. (3-3) Yr. Mr. Boyden
Three lectures and one section meeting weekly.
Prerequisite: courses 1 and 2, or consent of the instructor.
A study of the development of music from antiquity to the present; lectures, listening, technical analysis, and written reports.

Performance

Tryouts for enrollment in any performance course will be required during the period of registration. Further information may be obtained from the Department of Music.

All courses in this group may be repeated once without duplication of credit.

25. University Concert Band. (2) II. Mr. Cushing
Two hour-and-a-half rehearsals and one weekly section hour.
Open to any student in the University whose technical proficiency meets the requirements of concert performance.
See course 125.

35. University Chorus. (2) I and II. Mr. Lawton
Two hour-and-a-half rehearsals and one weekly section hour.
See course 135.
55. Piano Ensemble. (1) I and II. Mrs. Petray
Two class hours weekly.
Study and interpretation of four- and eight-hand piano literature.
Open to any student in the University of sufficient technical proficiency.
See course 155.
65. Chamber Music Ensemble. (1) I. Mr. Boyden
Two class hours weekly.
Open to any student of sufficient technical ability to take part in ensemble combinations for strings, wind instruments, piano.
See course 165.
75. University Symphony Orchestra. (2) I and II. _____
Two two-hour rehearsals weekly.
Open to any student in the University whose technical proficiency meets the requirements of concert performance.
See course 175.

UPPER DIVISION COURSES

Theory

Students should take courses 100A and 100B in the junior year.

- 100A. Score Reading. (2) I. Mr. Nollner, Mr. Sparks
Prerequisite: course 4A-4B.
- 100B. Keyboard Harmony. (2) II. Mr. Imbrie, Mr. Sparks
Prerequisite: course 4A-4B.
The reading of figured bass; sequences, modulations, etc., in the harmonic vocabulary of the eighteenth and nineteenth centuries.
101. Advanced Counterpoint. (3) I. Mr. Denny
Prerequisite: course 4A-4B.
102. Advanced Harmony. (3) II. Mr. Denny
Prerequisite: course 101.
- 105A-105B. Principles of Composition. (3-3) Yr. Mr. Cushing
Prerequisite: courses 101 and 102.
- 106A-106B. Canon and Fugue. (3-3) Yr. Mr. Sessions
Prerequisite: course 101.
- *107A-107B. Studies in Musical Analysis. (3-3) Yr. Miss Howe
Prerequisite: course 4A-4B.
- *107C. Musical Movement and Structure in Contemporary Practice. (3) I. Mr. Sessions
Prerequisite: course 107A-107B.
A review of contemporary musical materials with special emphasis on large design.
108. Instrumentation. (3) I. Mr. Denny
Prerequisite: course 4A-4B; 100A (may be taken concurrently).
A study of the instruments of the orchestra, leading to practice in scoring for instrumental combinations.
Teacher-training students are advised to take this course in their junior year.
109. Orchestration. (3) II. Mr. Denny
Prerequisite: course 108.

* Not to be given, 1949-1950.

Performance

Tryouts for enrollment in any performance course will be required during the period of registration. Further information may be obtained from the Department of Music.

All courses in this group may be repeated once without duplication of credit.

125. Advanced University Concert Band. (2) II. Mr. Cushing
Two hour-and-a-half rehearsals and one weekly section hour.
Prerequisite: completion of 4 units in course 25.
135. Advanced University Chorus. (2) I and II. Mr. Lawton
Two hour-and-a-half rehearsals and one weekly section hour.
Prerequisite: completion of 4 units in course 35.
155. Advanced Piano Ensemble. (1) I and II. Mrs. Petray
Two class hours weekly.
165. Advanced Chamber Music Ensemble. (1) I. Mr. Boyden
Two class hours weekly.
175. Advanced University Symphony Orchestra. (2) I and II. ———
Two two-hour rehearsals weekly.
Prerequisite: completion of 4 units in course 75.
185. String Quartet Repertory. (2) II.
The Griller Quartet (Mr. Griller in charge)
Prerequisite: two semesters of course 165 and consent of the instructor.

History and Literature

Courses in this group will be given in rotation: baroque, classic, romantic, modern. Prerequisite: course 30A-30B or consent of the instructor.

Baroque Period

- 116A. Survey of Musical Literature, 1600-1750. (3) II. Mr. Boyden
A survey of musical literature from Monteverdi to Handel and J. S. Bach.
- *116C. The Fugues of the Well-Tempered Clavichord. (3) Mr. Bloch
- *116D. The Cantatas of J. S. Bach and the Oratorios of G. F. Handel. (3) II. Mr. Boyden
- *116E. The Performance of Music, 1600-1750. (3) I. Mr. Boyden
This course will deal with the problems of performing the music of the period 1600-1750, according to contemporary documents (Monteverdi to C. P. E. Bach). Among the chief problems are: "realizing" the figured bass, ornamentation, deviations from the printed note, the proper instruments, expression, tempo, and dynamics.

Classic Period

- 117A. Survey of the Period, 1750-1827. (3) II. Mr. Bukofzer
The music of the early classic schools and of Haydn, Mozart, and Beethoven.
- *117B. The Operas of Mozart. (3) II. Mr. Bukofzer
- *117C. The String Quartets of Beethoven. (3) II. Mr. Elkus
- 117D. The Chamber Music of Mozart. (3) I. Mr. Boyden

Romantic Period

- *118A. Survey of the Period from Weber and Schubert to the Beginning of Impressionism. (3) I. ———
- *118B. The Operas of Verdi. (3) II. Mr. Bukofzer

* Not to be given, 1949-1950.

- *118C. The Operas of Wagner. (3) II. Mr. Elkus
 118D. Orchestral Music in the Nineteenth Century. (3) I. Mr. Denny

Modern Period

- *119A. Modern French Music. (3) I. Mr. Cushing
 Critical and analytical studies of selected works of French composers
 from 1870 to the present, with special reference to Fauré, Debussy, and
 Ravel.
 *119B. Selected Modern Works. (3) I. Mr. Cushing
 A critical and analytical study of works by Mussorgsky, Debussy, Ravel,
 Strawinsky, Hindemith, Bartók, and Bloch.
 119D. Survey of the Period. (3) I. Mr. Imbrie
 119E. Choral Music of the Twentieth Century. (3) II. Mr. Lawton

Forms and Mediums

- In special cases any student of at least junior standing may take course
 120A or 120B with the permission of the instructor.
 120A. Choral Literature: Josquin des Prez to Handel. (3) I. Mr. Lawton
 *120B. Choral Literature: Bach to the Present Day. (3) II. Mr. Lawton
 122A. Opera: Baroque and Classic. (3) I. Mr. Bukofzer
 122B. Opera: Romantic and Modern. (3) II. Mr. Bukofzer

National Schools

- *130. The Music of Spain. (3) II. _____
 From the Middle Ages to the present.

Special Study Courses

198. Group Special Study for Advanced Undergraduates. (2 or 3) I and II.
 The Staff (Mr. Lawton in charge)
 199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The Staff (Mr. Denny in charge)

GRADUATE COURSES

Permission of the instructor must be obtained before enrollment in any graduate course. For further conditions concerning admission to graduate courses, see page 163.

200. Fundamentals of Music Bibliography. (2) I. Mr. Duckles
 *201. Seminar: Studies in Orchestration. (2) II. Mr. Cushing
 *202. Seminar: The Nature of Harmony and Melody. (3) I. Mr. Elkus
 203. Seminar in Composition. (2-4) I and II. Mr. Elkus, Mr. Sessions
 Section 1. (2-2) Technical projects. Mr. Elkus
 Section 2. (2-2) Free composition. Mr. Sessions
 Section 3. (2-4) For continuing students. Mr. Sessions
 Prerequisite: courses 105A-105B, 106A-106B, or the equivalent, and
 permission of the instructor. Students taking the course for the first time
 shall enroll in both sections 1 and 2 unless expressly excused by permission
 of both instructors. Repetition of the course will be subject to the advice of
 the individual instructor.
 205. Seminar in Choral Scoring. (2) II. Mr. Lawton
 *206A-206B. Seminar: Studies in Musical Form. (3-3) Yr. Mr. Bukofzer
 A survey of the principles of structure in music from the Gregorian
 period to the present.

* Not to be given, 1949-1950.

- *210A-210B. Seminar in Early Music. (3-3) Yr. Mr. Lawton
211. Seminar: Studies in Musical Research. (3) II. Mr. Boyden
Prerequisite: course 200.
The work consists of two parts: a class problem designed to strengthen general background, and an individual research problem.
- *213A-213B. Seminar: Music of the Renaissance. (3-3) Yr. Mr. Bukofzer
214. Seminar: Reading of Musical Theorists. (3) I. Mr. Bukofzer
Reading and interpretation of theorists from the sixteenth century to the present.
- *215A-215B. Seminar: The History of Dissonance Treatment. (3-3) Yr.
(Formerly numbered 215.) Mr. Bukofzer
- *221. Seminar: Studies in Classic and Romantic Music. (3) I. Mr. Elkus
- *222. Seminar: The Concerto from the Baroque Period to the Present. (3) I.
Mr. Bukofzer
- *236. Advanced Studies in the Fugues of the Well-Tempered Clavichord.
(2) II. Mr. Bloch
250. Seminar in the Technique of Musicological Research. (2-4) I and II.
For prospective doctoral candidates. Mr. Bukofzer
298. Special Studies. (2-4) I and II. The Staff (Mr. Bukofzer in charge)
The department is ready to assist and advise competent graduate students who may propose plans for either research or creative work which meet with its approval.

TEACHING METHODS COURSES†

- 300A. Choral Literature for Secondary Schools. (2) I. Miss Bacon
Musical repertory for high school and junior college choruses, problems of leadership, presentation, organization, and program planning.
- 300B. Instrumental Literature for Secondary Schools. (2) II. Mr. Krieger
This course will consider suitable repertory for high school and junior college bands and orchestras, problems of leadership, presentation, organization, and program planning.
328. Methods of Teaching Vocal Techniques. (1) I and II. Mrs. Jones
Prerequisite: course 100B.
Principles of choral techniques; adapting best features to meet ensemble choral conditions; necessary transposition; care of adolescent voices; voice-testing; tone-production; evaluation of teaching materials.
Students may enroll for credit a second time in this course.
- 329A. Methods of Teaching Stringed Instruments. (1) I and II. Mr. F. Carter
- 329B. Methods of Teaching Brass Instruments. (1) I. Mr. Knuth
- 329C. Methods of Teaching Wood-Wind Instruments. (1) II. Mr. Knuth
The instruction offered in courses 329A-329C includes methods of teaching the various instruments used in the modern orchestra and band; their technical limitations and use; tone production; tuning; problems of instruction; teaching materials. A student may enroll for credit a second time in each course. Instruments for practice may be rented from a local music store by special arrangement.

* Not to be given, 1949-1950.

† See ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

PROFESSIONAL COURSES

409. Band Instrumentation. (2) II. Mr. Cushing
 Prerequisite: courses 100A and 108. Not open to juniors.
 A study of the instruments of the band; practice in scoring for selected wind instruments and for concert band.
- 435A-435B. Conducting. (2-2) Yr. Mr. Lawton, Mr. Denny
 Prerequisite: courses 100A and 108 (may be taken concurrently).
 Not open to juniors.
 435A. Choral Conducting: Mr. Lawton.
 435B. Instrumental Conducting: Mr. Denny.

The following classes, intended for students of demonstrable aptitude for a specific instrument, aim to develop mastery. Open to any student in the University. Each class is limited to an enrollment of eight; music majors enrolled in orchestra, band, or chamber music will be given preference. A course may be repeated.

- *445B. Oboe. ($\frac{1}{2}$) I and II. _____
 445D. Bassoon. ($\frac{1}{2}$) I and II. Mr. Kubitschek
 455A. French Horn. ($\frac{1}{2}$) I and II. Mr. Trutner
 *455C. Trombone. ($\frac{1}{2}$) I and II. _____
 *475A. Violin and Viola. ($\frac{1}{2}$) I. _____
 *475D. Stringed Bass; Tuba. ($\frac{1}{2}$) I and II. _____

NAVAL SCIENCE

- HAROLD A. CARLISLE, Captain, U.S.N.; Professor of Naval Science (Chairman of the Department).
 CHESTER W. NIMITZ, JR., Commander, U.S.N.; Associate Professor of Naval Science.
 KENNETH E. HANSON, Commander, U.S.N.; Associate Professor of Naval Science.
 RICHARD J. MORRISSEY, Major, U.S.M.C.; Associate Professor of Naval Science.
 AUSTIN N. SPEER, Lieutenant Commander, AVH, U.S.N.; Associate Professor of Naval Science.
 HENRY H. BISHOP, Lieutenant, U.S.N.R.; Assistant Professor of Naval Science.
 LEE S. DOLSON, Lieutenant (jg), U.S.N.R.; Assistant Professor of Naval Science.
 ROBERT H. GULMON, Lieutenant, U.S.N.; Assistant Professor of Naval Science.
 JOHN C. MOORE, Lieutenant, Supply Corps, U.S.N.; Assistant Professor of Naval Science.

Letters and Science List.—Not more than 8 units of lower division courses in this department may be included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Courses in this department are normally restricted to students who are regularly enrolled members of the Naval Reserve Officers' Training Corps. Details concerning enrollment are available in Room 47, Gymnasium for Men, Office of the Department of Naval Science. Candidates must be able to complete all requirements of the Naval R.O.T.C. curriculum, without serious interference from or with other academic work which is required for the bachelor's degree.

All students enrolled in the Naval Reserve Officers' Training Corps are required to engage in drill or practical exercises two hours weekly.

* Not to be given, 1949-1950.

LOWER DIVISION COURSES

- 1A. Naval Orientation, Part I. (3) I. Mr. Bishop
Naval history, functions and organization, and the characteristics of naval ships.
- 1B. Naval Orientation, Part II. (3) II. Mr. Bishop
Survey of basis of naval justice and customs; elements of leadership; basic seamanship.
- 2A. Naval Weapons. (3) I. Mr. Hanson, Mr. Dolson
Ammunition components, gun assemblies, major and intermediate caliber installations, machine guns, torpedoes, mines, depth charges, rockets, surface fire control.
- 2B. Naval Fire Control. (3) II. Mr. Hanson, Mr. Dolson
Prerequisite: course 2A.
Antiaircraft fire control, fire control systems, naval electronics equipment, CIC operations, torpedo control, spotting, shore bombardment, guided missiles.

UPPER DIVISION COURSES

- 101A. Navigation; Piloting. (3) I. Mr. Speer
Navigation instruments and equipment; dead reckoning; piloting; maneuvering board; rules of the road; aerology.
- 101B. Navigation; Celestial. (3) II. Mr. Speer
The theory and technique of surface and aerial navigation.
- 102A. Naval Engineering. (3) I. Mr. Gulmon
Naval boilers and auxiliaries; naval steam turbines; naval Diesel engines; aircraft engines.
- 102B. Damage Control and Naval Officer Orientation. (3) II. Mr. Gulmon
Ship's stability and fire fighting. The last half of this course is designed to prepare the student for his first assignment afloat, and includes naval justice and leadership.
- 106S. Supply Ashore. (3) I. Mr. Moore
Supply Corps organization, operation, and accounting, ashore.
- 107S. Supply Afloat. (3) II. Mr. Moore
Supply Corps organization, operation, and accounting, afloat.
- 103M. U. S. Military Policy and Principles of War. (3) II. Mr. Morrisey
Development of U. S. Military forces; significance of military power; and historical analysis of principles of war.
- 104M. An Analysis of American Battles. (3) I. Mr. Morrisey
Principles of war; development of weapons, equipment, tactics, and techniques.
- 105M. Amphibious Operations. (3) I and II. Mr. Morrisey
Broad introduction to the specialized field of amphibious warfare by a limited treatment of the factors pertaining to its planning and execution.

NEAR EASTERN LANGUAGES

WALTER J. FISCHER, Ph.D., Professor of Semitic Languages and Literature
(Chairman of the Department).

HENRY L. F. LUTZ, Ph.D., D.D., Professor of Egyptology and Assyriology.

WILLIAM POPPER, Ph.D., Professor of Semitic Languages, Emeritus.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Fischel.

Preparation for the Major.—Course 13A–13B or 25A–25B; 6 units of Hebrew or Greek; a reading knowledge of French and German.

The Major.—Required: 16 units in language courses in the department. The remaining 8 units may include not more than 6 of lecture courses in the department and, with departmental approval, from 2 to 8 units in other departments.

Courses in History and Religion

Elective courses not requiring a knowledge of any Near Eastern language.

- 13A–13B. Ancient History of the Near East. (3–3) Yr. Mr. Lutz
Egypt, Babylonia, Iran, Syria, Phoenicia, Palestine, Asia Minor, and the Aegean Islands from the Paleolithic Age to the Roman Period. Course 13A is not prerequisite to 13B.
- 25A–25B. History of the Mohammedan Civilization. (2–2) Yr. Mr. Fischel
This course will give a survey of the origin and development of the Mohammedan civilization and will furnish the background for the understanding of the modern Islamic world in Asia and Africa.
- 102A–102B. Religion and Mythology of Egypt, Babylonia, and Assyria. (2–3; 2–3) Yr. Mr. Lutz
Prerequisite: junior standing and course 13A–13B or 25A–25B.
- 110A–110B. Introduction to Hebrew and Arabic Literature. (2–2) Yr. Mr. Fischel
110A. Survey of Hebrew literature, covering post-Biblical, medieval, and modern literature in various centers of the Orient and Europe.
110B. Survey of Arabic literature from pre-Islamic to medieval and modern times.

Language Courses

The specific courses given in any year, the hours thereof, and the authors read, will depend upon the needs of the students; courses numbered over 200 may be repeated for credit without duplication of work.

Course 21A–21B or a satisfactory equivalent in other languages is prerequisite to all upper division language courses in the department.

- 21A–21B. Elementary Hebrew. (3–3) Yr. Mr. Fischel
- 121A–121B. Intermediate Hebrew. (2–2) Yr. Mr. Fischel
Rapid reading of selections from the historical books of the Old Testament.
- 131A–131B. Elementary Arabic. (3–3) Yr. Mr. Fischel
- †141A–141B. Elementary Syriac. (2–2) Yr. Mr. Fischel
- 151A–151B. Elementary Assyrian. (3–3) Yr. Mr. Lutz
- 152A–152B. Elementary Sumerian. (2–2) Yr. Mr. Lutz
Prerequisite: course 151A–151B.
- 161A–161B. Elementary Egyptian. (3–3) Yr. Mr. Lutz
Prerequisite: course 21A–21B or 6 units of Greek.
- 171A–171B. Elementary Coptic. (2–2) Yr. Mr. Lutz
Prerequisite: course 21A–21B or 6 units of Greek.
199. Special Study for Advanced Undergraduates. (1–5) I and II. Mr. Lutz, Mr. Fischel

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 224A–224B. Advanced Biblical Hebrew. (2–2) Yr. Mr. Fischel
One or more of the prophetic and poetical books, with special attention to literary form.

† To be given if a sufficient number of students enroll.

227A-227B. Post-Biblical Hebrew. (1-1) Yr. Unvocalized texts.	Mr. Fischel
231A-231B. Advanced Arabic. (3-3) Yr. Selections from (a) Historical works; (b) The Thousand and One Nights.	Mr. Fischel
232A-232B. Advanced Arabic. (3-3) Yr. 232A. The Koran. 232B. Poetry.	Mr. Fischel
†241A-241B. Advanced Syriac. (2-2) Yr.	Mr. Fischel
†251A-251B. Advanced Assyro-Babylonian. (2-2) Yr.	Mr. Lutz
†252A-252B. Advanced Sumerian. (2-2) Yr.	Mr. Lutz
†261A-261B. Advanced Egyptian. (2-2) Yr.	Mr. Lutz
†271A-271B. Advanced Coptic. (2-2) Yr.	Mr. Lutz
280A-280B. Seminar. (2-5; 2-5) Yr.	Mr. Lutz, Mr. Fischel
290A-290B. Special Study. Credit according to work accomplished.	Mr. Lutz, Mr. Fischel

NURSING

PEARL CASTILE, R.N., Ed.D., Associate Professor of Nursing.

MARY T. HARMS, R.N., M.A., Assistant Professor of Nursing.

JEANNETTE S. HILLER, R.N., A.B., M.A., P.H.N., Assistant Professor of Nursing.

ALICE E. INGMIRE, R.N., M.A., Assistant Professor of Nursing.

AMY A. MACOWAN, R.N., M.A., Assistant Professor of Public Health Nursing.

MILDRED E. NEWTON, R.N., M.A., Assistant Professor of Nursing.

MARGARET A. TRACY, R.N., M.S., Assistant Professor of Nursing (Chairman of the Department).

HANNAH BINHAMMER, R.N., B.S., Instructor in Nursing.

ANN HILL, J.D., R.N., B.S., P.H.N., Instructor in Nursing.

BERNICE C. HUDSON, R.N., M.A., Instructor in Nursing.

*RUTH L. LOTSPEICH, R.N., B.S., Instructor in Nursing.

DOROTHY K. LOVELAND, R.N., B.S., Instructor in Nursing.

LURA M. MORSE, Ph.D., Instructor in Home Economics.

*FRANCES RULE, R.N., B.S., Instructor in Nursing.

KATHRYN M. SMITH, R.N., B.S., Instructor in Nursing.



HENRY B. BRUYN, M.D., Instructor in Pediatrics.

RUTH COOPER, M.A., Assistant Professor of Social Welfare.

JACKSON CRANE, M.D., Assistant Resident in Pathology.

SARA V. HOLMES, R.N., B.S., Lecturer in Nursing.

CARL H. JONAS, M.D., Assistant Clinical Professor of Psychiatry and Lecturer in Social Welfare.

C. HENRY KEMPE, M.D., Instructor in Pediatrics.

JOHN B. LAGEN, M.D., Associate Professor of Medicine.

ELEANOR W. LEWIS, R.N., A.B., B.N., Lecturer in Psychiatric Nursing.

MARTIN B. LOEB, A.B., Assistant Professor of Social Welfare.

EDMUND W. OVERSTREET, M.D., Assistant Professor of Obstetrics and Gynecology.

ALEX C. SHERRIFFS, Ph.D., Assistant Professor of Psychology.

† To be given if a sufficient number of students enroll.

* Absent on leave, 1949-1950.

HENRY K. SILVER, M.D., Assistant Professor of Pediatrics.

WILLIAM W. STILES, M.D., M.P.H., Associate Professor of Public Health.

MARY KING VICKERY, R.N., B.S., Lecturer in Nursing.

OLIVE WALKLEY, R.N., A.B., B.N., Lecturer in Psychiatric Nursing.

(GIVEN AT BERKELEY)

The following courses are open only to students enrolled in the curricula for graduate nurses.

PROFESSIONAL COURSES

416. Health Teaching. (3) I and II. Miss MacOwan
418. The Nurse in Public Health. (3) I and II. Miss MacOwan
A study of public health nursing functions and activities.
419. The Field of Public Health Nursing. (3) I and II. Miss MacOwan
Consideration of the essentials of a good public health nursing service.
420. Field Work in Public Health Nursing. (8) I and II. Miss Hill
Open only to students who are registered nurses and who have completed the requirements for the B.S. degree in the School of Nursing, including all courses required in the first two semesters of the curriculum in public health nursing. Enrollment limited to twenty-five students each semester.
Approximately forty hours a week of continuous field service, including individual and group conferences. The field work is arranged in cooperation with the health agencies of the San Francisco Bay region. Applications must be in at least 2 months before field work is to begin.
Required of all candidates for the Certificate in Public Health Nursing.
432. Principles of Nursing Education. (2) II. Miss Tracy, Miss Newton
Required of all candidates for the Certificate in Nursing Education.
434. Principles of Ward Management and Teaching. (3) I. Miss Castile
Prerequisite: course 432, Education 110, or consent of the instructor.
Required of all candidates for the Certificate in Nursing Education.

GRADUATE COURSES

As a condition of enrollment in a graduate course the student must have met full graduate status in the Graduate Division, Northern Section, including 15 units of advanced work basic to the proposed major subjects for a higher degree; be certified by the Department of Nursing as to eligibility to complete the program; and satisfy professional requirements as established by the School of Nursing.

Specific prerequisites: completion of 5 units of education courses including Education 110, and 5 units of social economics courses including Social Welfare 100.

200. Problems of Administration in Nursing. Seminar. (2) II.
Miss Tracy, Miss Castile
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434.
Basic material of study will be school surveys; national surveys and contributions to education in the field of administration.
201. Surveys in Nursing. (3) I. Miss Tracy, Miss MacOwan
Lectures and laboratory.
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434.
Training in practical application of principles and techniques developed in school surveys, including additional field work equivalent to two hours per week.

202. Principles and Techniques of Supervision in Nursing. Seminar. (2) I.
Miss Newton, Miss MacOwan
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434,
or by consent of the instructor.
A consideration of the principles and techniques of supervision appropriate for a modern program of education.
203. Nursing Staff Personnel Problems. (3) II. Miss Castile
A course designed for administrators and teachers in leadership positions and for those concerned with teacher welfare.
204. Curriculum Development in Nursing. (3) I.
Miss MacOwan, Miss Castile
Problems of curriculum construction as they relate to the selection and organization of material into units of instruction.
205. Problems in Curriculum Development. (2) II.
Prerequisite: course 204. Miss MacOwan, Miss Castile
Designed especially for administrators, supervisors, and teachers who have problems in curriculum development.
206. Curriculum and Teaching Problems in Nursing. Practicum. (6) II.
Miss Castile, Miss MacOwan
An opportunity for qualified students to work on practical curriculum and teaching problems under guidance.
207. Historical Foundation of Nursing. (3) II. Miss Newton
An evaluation of cultural, religious, secular, military, and educational influences upon nursing. Emphasis on international relationships.
208. Counseling. (3) II. Mrs. Ingmire
A comprehensive analysis of the problems and programs of guidance in schools of nursing.

(GIVEN AT SAN FRANCISCO)

For more detailed description of the following courses see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

PROFESSIONAL COURSES

433. Field Course in Nursing Education. (6) I and II. Miss Newton in charge
Open only to students who have completed the requirements for the B.S. degree in the School of Nursing, including all courses required in the first two semesters of the curriculum in nursing education.
Approximately forty hours a week of continuous field experience, including individual and group conferences. Head nurse experience offered only in the same semester as basic courses are given for that service.
Required of all candidates for the Certificate in Nursing Education.
443. Field Work in Nursing Education. (6) I and II. Miss Lewis
Prerequisite: course 433.
Continuation of course 433 for students specializing in advanced psychiatric nursing. Approximately forty hours a week continuous field experience at Langley Porter Clinic and selected state hospitals for the mentally ill. Individual and group conferences.
- 416A. Health Teaching. (1) II. Mrs. Hiller
418. The Nurse in Public Health. (3) I and II. Mrs. Hiller
Parallels course 418 given at Berkeley.
- 418E. Community Nursing. (2) I and II. Mrs. Hiller
421. History of Nursing. (2) I. Miss Newton
423. Professional Adjustments. (1) II. Miss Lotspeich

425. Pathology. (1) I. Mr. Crane
 427A-427B. Pharmacology and Therapeutics. (2-1) Yr. Miss Binhammer, Mr. Lagen
432. Principles of Nursing Education. (2) II. Miss Tracy, Miss Newton
435. Introduction to Nursing Arts. (5) I. Mrs. Ingmire, Miss Hudson
437. Advanced Nursing. (1) II. Mrs. Ingmire
- 440A. Principles of Medicine. (2) II. Mr. Lagen, Miss Torrey
- 440E. Medical Nursing. (2) I and II. Miss Binhammer
- 440F. Medical Nursing. (2) I and II. Miss Binhammer
- 441A. Principles of Psychiatry. (1) II. Mr. Jonas
- 441E. Psychiatric Nursing. (2) I and II. Miss Walkley
- 442A. Principles of Surgery. (2) II. Mr. Palmer, Mr. Silvani
- 442E. Surgical Nursing. (3) I and II. Miss Loveland
- 442F. Surgical Nursing. (2) I and II. Miss Loveland, Miss Harms, Mrs. Vickery
- 444A. Principles of Pediatrics. (2) I. Mr. Bruyn
- 444E. Pediatric and Communicable Disease Nursing. (2) I and II. Miss Smith
- 444F. Pediatric and Communicable Disease Nursing. (2) I and II. Miss Smith
446. Principles of Communicable Diseases. (2) I. Mr. Silver
- 448A. Principles of Obstetrics. (2) I. Mr. Palmer
- 448E. Obstetrical Nursing. (2) I and II. Miss Best

UPPER DIVISION COURSES

EDUCATION

110. Introduction to Educational Psychology. (3) II. Mrs. Learnard
 Parallels Education 110 given at Berkeley.

HOME ECONOMICS

104. Diet Therapy. (3) II. Miss Morse
 Prerequisite: Home Economics 111.
111. Nutrition. (3) I. Miss Morse
 Parallels Home Economics 111 given at Berkeley.

PSYCHOLOGY

112. Developmental Psychology. (2) II. Mr. Sherriffs
 Parallels Psychology 112 given at Berkeley.

PUBLIC HEALTH

125. Child Hygiene. (2) I and II. _____
 (Formerly numbered 121.)
 Parallels Public Health 125 given at Berkeley.
145. Community Control of the Communicable Diseases. (3) I. Mr. Stiles
 Parallels Public Health 145 given at Berkeley.

SOCIAL WELFARE

100. The Field of Social Welfare. (3) I. Mrs. Wilshire
 Parallels Social Welfare 100 given at Berkeley.
106. Community. (2) I. Mr. Loeb
 Parallels Social Welfare 106 given at Berkeley.

OCEANOGRAPHY

Marine Sciences

Courses in oceanography leading to the master's or doctor's degree in oceanography and certain of the marine sciences are offered for a limited number of qualified students at the Scripps Institution of Oceanography at La Jolla, California. Detailed information concerning the courses may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES. For further information concerning the Institution refer to the Registrar of the University of California, 405 Hilgard Avenue, Los Angeles 24, or write to the Director of the Institution.

OPTOMETRY

KENNETH B. STODDARD, Ph.D., Professor of Physiological Optics and Optometry (Chairman of the Department).

RALPH S. MINOR, Ph.D., Professor of Physics and Optometry, Emeritus.

MEREDITH W. MORGAN, JR., Ph.D., Associate Professor of Physiological Optics and Optometry.

GORDON L. WALLS, Sc.D., Associate Professor of Physiological Optics and Optometry and Lecturer in Physiology.

OWEN C. DICKSON, M.D., Assistant Clinical Professor of Ophthalmology.

JACK T. HOBSON, B.S., Assistant Clinical Professor of Optometry.

FREDERICK L. MASON, M.A., Assistant Clinical Professor of Optometry.

HENRY B. PETERS, M.A., Assistant Clinical Professor of Optometry.

FERD T. ELVIN, A.B., Clinical Instructor in Optometry.

BARTHOLOMEW J. GUARISCO, B.S., Clinical Instructor in Optometry.

ROBERT F. HARRIGAN, B.S., Clinical Instructor in Optometry.

HAROLD A. JACOBSON, A.B., Clinical Instructor in Optometry.

ROBERT W. LESTER, A.B., Clinical Instructor in Optometry.

RALPH M. MARSHALL, A.B., Clinical Instructor in Optometry.

HENRY S. MIODUCHOWSKI, B.S., Clinical Instructor in Optometry.

HARRY J. RAAB, B.S., Clinical Instructor in Optometry.

BLANCHE E. SMITH, B.S., Clinical Instructor in Optometry.



SHERBURNE F. COOK, Ph.D., Lecturer in Optometry and Professor of Physiology.

UPPER DIVISION COURSES

Prerequisite.—Physics 2A-2B, 3A-3B, Chemistry 1A, 8, Mathematics 3A, Physiology 1, 1L or Zoölogy 1A, Anatomy 102, Psychology 1A, 33, together with all prerequisite courses, and the degree of Associate in Arts or its equivalent are prerequisite to all courses in the Department of Optometry.

101. Advanced Geometrical Optics. (3) I.

Mr. Mason

Prerequisite: Physics 108A-108B.

The mathematical development of the paraxial laws of optical image formation, employing the methods of Gauss. Application to the optical devices used to evaluate and aid the functions of vision. Classroom computation of marginally corrected lenses, isekonic lenses, and contact lenses.

102A-102B. Elementary Theoretical Optometry. (3-4) Yr.

Mr. Mason, Mr. Hobson

One unit of laboratory will be given in the second semester.

A study of the states of refraction of the eye, the correlated visual sensations, effects upon visual functions, optical methods of correction, and instruments used to detect and measure anomalous states of refraction.

103A-103B. Advanced Theoretical Optometry. (3-3) Yr.

Prerequisite: course 102A-102B.

Mr. Morgan, Mr. Stoddard

Extension of the principles discussed in course 102A-102B to the functions of the eyes in binocular vision. Stereoscopic vision, physical and physiological aspects of the fusion movements, binocular accommodation and convergence, strabismus and other anomalies of binocular vision, and ocular paralyses.

PROFESSIONAL COURSES

401A-401B. Practical Optics. (2-2) Yr.

Mr. Peters

Lecture and laboratory.

Lectures: history of the development of lenses and spectacles; the optical properties of different glasses; the theory of the design of spectacle lenses. Laboratory: lens surfacing, edging, beveling, mounting, neutralization, and frame fitting.

404A-404B. Practical Optometry. (3-3) Yr.

Mr. Hobson

Prerequisite: courses 102A-102B and 401A-401B.

Lectures and problems dealing with physical eye examinations. A study of instruments and the technique for their use, interpretation of examination data and prescribing of lenses, and orthoptic training.

406A-406B. Optometry Clinic. (1-1) Yr. The Staff (Mr. Hobson in charge)

Prerequisite: courses 102A-102B, 401A-401B, Physiology 115.

Complete physical eye examinations with clinic patients. The adaptation of lenses to the defective eye and the study of abnormal visual conditions.

407A-407B. Pathology of the Eye. (2-1) Yr.

Mr. Dickson

Prerequisite: Anatomy 102, Physiology 115, Bacteriology 2 or 7.

Lectures dealing with the identification of pathological conditions in the eye, and the manifestation of organic disease as indicated by the eye.

499. Special Study for Advanced Undergraduates. (1-4) I and II.

The Staff (Mr. Stoddard in charge)

GRADUATE PROFESSIONAL COURSES

(Concerning conditions for admission to graduate courses, see page 163)

The Bachelor of Science degree in the School of Optometry, or its equivalent, is a prerequisite to all optometry courses of the graduate year.

*409A-409B. Clinical Practice. (6-6) Yr.

The Staff (Mr. Stoddard in charge)

The examination and treatment, with lenses or orthoptic training, of patients with visual anomalies.

*412A-412B. Advanced Clinical Procedures. (2-2) Yr.

Mr. Morgan

Lectures and class assignments on the orthoptics of strabismus and other binocular anomalies, subnormal vision, telescopic spectacles, contact lens fitting, and allied subjects.

*414A-414B. Seminar in Clinical Problems. (2-2) Yr.

A discussion of the various phases of optometry associated with problems arising from clinical cases.

* Not to be given, 1949-1950.

*417. Optometry Law and Economics. (1) II.

A consideration of the laws governing the practice of optometry, and the problems associated with the establishing of a professional optometric practice.

PHYSIOLOGICAL OPTICS

UPPER DIVISION COURSES

- 105A-105B. Physiological Optics. (3-3) Yr. Mr. Stoddard, Mr. Walls
Prerequisite: for course 105A, Physics 108A-108B, Physiology 115;
for course 105B, consent of the instructor.
Lectures on the physics, physiology, and psychology of vision.
105A: The visual pathways, the visual field, the pupil- and accommodative-mechanisms, the interaction between radiation and ocular tissue, the aberrations of the eye, illumination, and allied phenomena.
105B: The psychophysics and physiological psychology of light, form, and color senses, and the elements of visual perception.
- 106A-106B. Physiological Optics. (1-1) Yr. Mr. Stoddard, Mr. Walls
Laboratory experiments in physiological optics to accompany course 105A-105B.
109. Physiological Optics. (3) II. Mr. Walls
Lectures on the physics, physiology, and psychology of vision for students in electrical engineering whose option is illumination engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 201A-201B. Seminar in Advanced Physiological Optics. (2-2) Yr.
Mr. Stoddard, Mr. Walls
A discussion of selected topics and current research literature in the various fields associated with vision.
- *203. Binocular Vision and Space Perception. (2) I.
Mr. Morgan, Mr. Walls
A consideration of the precise nature of binocular vision and monocular and binocular space perception.
- *205. Color Vision. (1) II. Mr. Walls
A study of color vision, both normal and abnormal, with a critical analysis of the various theories of color vision.
299. Research. (2-8) I and II. Mr. Stoddard, Mr. Morgan, Mr. Walls

COURSES IN OTHER DEPARTMENTS

- Anatomy and Physiology of the Eye (Physiology 115).
Mammalian Physiology (Physiology 110A-110B).
Geometrical and Physical Optics (Physics 108A-108B).

ORIENTAL LANGUAGES

- †PETER A. BOODBERG, Ph.D., Professor of Oriental Languages.
YUEN REN CHAO, Ph.D., Litt.D., Professor of Oriental Languages and Linguistics (Chairman of the Department).
FERDINAND D. LESSING, Ph.D., Agassiz Professor of Oriental Languages, Emeritus.
DENZEL CARE, Ph.D., Acting Associate Professor of Oriental Languages.
SHIH-HSIANG CHEN, B.Litt., Assistant Professor of Chinese.

* Not to be given, 1949-1950.

† Sabbatical leave in residence, 1949-1950.

MARY R. HAAS (Mary Haas Subhanka), Ph.D., Assistant Professor of Siamese and Linguistics.

EDWARD H. SCHAFER, Ph.D., Assistant Professor of Oriental Languages.



ELIZABETH HUFF, Ph.D., Lecturer in Oriental Languages.

RICHARD J. MILLER, M.A., Lecturer in Oriental Languages.

SUSUMU W. NAKAMURA, M.A., Lecturer in Japanese.

LEONARDO OLSCHKI, Ph.D., Lecturer in Oriental Languages.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. SCHAFER (Chinese); Mr. CARE (Japanese).

Preparation for the Major.—

Required: (a) Emphasis on Chinese—

Freshman year: courses 12A–12B, 13, 17.

Sophomore year: course 23A–23B.

(b) Emphasis on Japanese—

Freshman year: courses 9A–9B (or 29A–29B), 13, 17.

Sophomore year: course 39A–39B.

(c) Emphasis on Oriental Linguistics—

All courses listed in either (a) or (b), above.

Recommended: English 25, History 19A–19B.

Sixteen units of lower division language courses in the department are prerequisite to all upper division language courses; students who offer course 29A–29B instead of course 9A–9B must, in addition to 14 lower division units, take course 119A as prerequisite to other upper division language courses.

The Major:

Required: (1) With emphasis on Chinese or Japanese:

(a) Chinese: courses 103, 113, 123, 191A–191B; or Japanese: courses 119A–119B, 129A–129B, 139.

(b) Courses 137, 147, 198.

(c) 4 units selected from courses 100A–100B, 113, 117, 133A–133B, 191C–191D, 193.

(d) 4 units selected from other upper division language or lecture courses in the department.

(2) With emphasis on Oriental Linguistics:

(a) Courses 100A–100B, 117, 123 or 139, 135, 167, 177, 197A–197B, 198.

(b) 4 upper division units in an Oriental language other than the language offered in satisfaction of the lower division requirement.

Recommended: a reading knowledge of French, German, or Russian.

Undergraduate students expecting to proceed to the M.A. or the Ph.D. degree in Oriental languages must take courses 117, 133A–133B, and 193 in their senior year.

Students who fail to maintain an average of at least 1.5 grade points for each unit of work undertaken in the upper division in the department will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major.

LOWER DIVISION COURSES

9A–9B. Elementary Modern Japanese. (3–3) Yr.

Mr. Miller

Not open to students with previous experience in the language.

- 12A-12B. Elementary Written Chinese. (3-3) Yr. Mr. Schafer in charge
To be taken concurrently with 13 and 17.
13. Classical Chinese. (2) II. Mr. Schafer, Mr. Miller
To be taken concurrently with 12B, 9B or 29B.
17. Introduction to the Study of Chinese Characters and Sino-Japanese. (2) I.
Mr. Miller, Mr. Carr
To be taken concurrently with 12A, 9A or 29A.
- 23A-23B. Intermediate Chinese. (3-3) Yr. Mr. Chen, Mr. Schafer
Prerequisite: courses 12A-12B, 13, and 17.
- 29A-29B. Japanese Oral and Written Composition. (2-2) Yr. Mr. Nakamura
- 39A-39B. Intermediate Japanese. (3-3) Yr. Mr. Nakamura
Prerequisite: courses 9A-9B, 13, and 17.

LECTURE COURSES

- *32. Evolution of Japanese Civilization before 1868. (2) Mr. Carr
- *42. Chinese Civilization in the Asiatic Context. (2) Mr. Boodberg

UPPER DIVISION COURSES

100. Languages of Eastern Asia. (2) II. Mr. Boodberg
A survey course on the nature and distribution of the main languages of Eastern Asia.
103. Chinese Narrative Prose. (2) I. Mr. Schafer
108. Elementary Malay. (2) I. Mr. Carr
113. Chinese Classics. (2) II. Mr. Schafer
117. Logography and the Evolution of the Chinese Language and Script. (2) I. Mr. Boodberg
118. Introduction to Malayo-Polynesian Linguistics. (2) II. Mr. Carr
- 119A-119B. Third-Year Japanese. (2-2) Yr. Mr. Nakamura
123. Chinese Grammar. (3) II. Mr. Chao
- 129A-129B. Introduction to Classical Japanese. (2-2) Yr. Mr. Carr
- 133A-133B. Chinese Bibliography. (2-2) Yr. Miss Huff
Open to seniors.
135. Phonology of Ancient Chinese. (3) I. Mr. Chao
137. Advanced Colloquial Chinese and Japanese. (3) I. Mr. Chao, Mr. Nakamura
Open only to students majoring in Oriental languages.
An intensive course to provide training in the active use of colloquial Chinese or Japanese. Five to ten laboratory hours weekly.
139. Japanese Grammar. (2) II. Mr. Carr
147. Elements of Chinese and Japanese Culture. (1) II. Mr. Chen, Mr. Nakamura
Prerequisite: course 137.
Lectures in Chinese or Japanese.
- †154. Mongolian. (2) I and II. Mr. Lessing
May be repeated without duplication of credit.
- †164. Tibetan. (2) I and II. Mr. Lessing
May be repeated without duplication of credit.
167. Phonetics and Phonemics. (2) I. Miss Haas
Open to qualified language students and students of anthropology.
- *173A-173B. Chinese Philosophical Texts. (2-2) Yr.

* Not to be given, 1949-1950.

† To be given if a sufficient number of students enroll.

- †174A-174B. Siamese (Thai). (3-3) Yr. Miss Haas
- †174C-174D. Readings in Siamese. (2-2) Yr. Miss Haas
177. Types of Linguistic Structure. (2) II. Miss Haas
 A rapid general survey followed by a more detailed presentation of selected Far Eastern and American Indian languages. Open to qualified language students and students of anthropology.
- 191A-191B. Masterpieces of Chinese Literature and Literary Criticism. (2-2) Yr. Mr. Chen
 Recommended to be taken concurrently with course 112A-112B.
 191A. Verse.
 191B. Belles-lettres.
- 191C-191D. Masterpieces of Chinese Literature and Literary Criticism. (2-2) Yr. Mr. Chen
 191C. The Novel.
 191D. The Short Story and Essay.
193. Language and Culture in East Asia: Readings in Sinological Literature. (2) II. Mr. Schafer
- 197A-197B. Linguistics Laboratory. (3-3) Yr. Miss Haas
 The technique of recording and analyzing a foreign language by working directly with a native speaker. An Oriental language will be used as model. Open to qualified language students and students of anthropology who have had courses 167 and 177. May be repeated without duplication of credit with the permission of the instructor.
198. Special Study for Advanced Undergraduates and the Senior Essay. (1-2) I and II. Mr. Carr, Mr. Boodberg, Mr. Schafer
 Required of all majors in Oriental languages.
 I. Mr. Schafer, Mr. Boodberg.
 II. Mr. Carr, Mr. Boodberg.
- *199. Special Individual Study. (1-5). Mr. Lessing

LECTURE COURSES

Prerequisite: junior standing. Knowledge of an Oriental language not required.

- 112A-112B. Survey of Chinese Literature and Literary Criticism. (2-2) Yr. Mr. Chen
 The general characteristics, main currents, and representative authors of Chinese literature from the beginning to modern times. Texts and references in English translation critically analyzed.
- *132. History of Japanese Literature. (2) II. Mr. Carr
 Prerequisite: course 32.
 From the beginning to modern times, emphasizing Chinese, Buddhist, and Western influences.
- 142A-142B. Civilizations of Eastern Asia. (2-2) Yr. Mr. Schafer, Mr. Carr
 (Formerly numbered 142.)
 Cultures of the higher civilizations, with special emphasis on the roles of religion, mythology, and folklore.
 142A. China, Tibet, Annam, Champa, Cambodia, Siam, Burma. Mr. Schafer.
 142B. Japan, Korea, Siberia, Manchuria, Mongolia, Turkestan, Indonesia. Mr. Carr.
151. Western and Chinese Travelers in Asia. (2) I. Mr. Olschki
152. Marco Polo's Asia. (2) II. Mr. Olschki

† To be given if a sufficient number of students enroll.
 * Not to be given, 1949-1950.

- *162A-162B. Chinese Thought and Culture from Han to Sui. (2-2) Yr.
 172A-172B. Buddhism as a Cultural Factor in the Far East. (2-2) Yr.
 Mr. Lessing
 *182. Life and Times of Confucius. (2) II. Mr. Boodberg
 *188. Philological Method: Languages and Literatures of Eastern Asia. (1)
 Mr. Schafer

GRADUATE COURSES

A reading knowledge of either French or German is prerequisite to the first year of graduate work; a reading knowledge of both French and German is prerequisite to the second year.

- 201A-201B. Buddhist Texts. (2-2) Yr. Mr. Lessing
 †207A-207B. Seminar in Descriptive Linguistics (Phonemics, Morphology, Syntax). (2-2) Yr. Miss Haas
 212. Problems in Chinese Literary Criticism. (2) I. Mr. Chen
 *213A-213B. Seminar in Philological Analysis of Chinese Sources of the Post-Han Period. (2-2) Yr. Mr. Boodberg
 214A-214B. Tenth- and Eleventh-Century Texts: Sources for the Civilization of the Five Dynasties Period. (2-2) Yr. Mr. Schafer
 (Formerly numbered 214.)
 †227A-227B. Seminar in Historical Linguistics. (2-2) Yr. Miss Haas
 235. Seminar in Chinese Dialectology. (2) II. Mr. Chao
 †237A-237B. Linguistic Methods in Teaching Oriental Languages. (2-2) Yr.
 Mr. Carr, Mr. Chao
 A seminar and practicum devoted to the development of teaching material in an Oriental language taught in the department.
 239A-239B. Seminar in Japanese. (2-2) Yr. Mr. Carr
 250. Research. (1-4) I and II. The Staff

PALEONTOLOGY

- CHARLES L. CAMP, Ph.D., Professor of Paleontology and Curator of Amphibians and Reptiles in the Museum of Paleontology
 RALPH W. CHANEY, Ph.D., Professor of Paleontology and Curator of the Paleobotanical Collection in the Museum of Paleontology.
 J. WYATT DURHAM, Ph.D., Associate Professor of Paleontology and Curator of Invertebrate Collections in the Museum of Paleontology.
 ROBERT M. KLEINFELL, Ph.D., Associate Professor of Paleontology and Curator of Micropaleontological Collections in the Museum of Paleontology.
 RUBEN A. STERTON, Ph.D., Associate Professor of Paleontology (Chairman of the Department), Curator of Mammals and Director of the Museum of Paleontology.
 DONALD E. SAVAGE, Ph.D., Instructor in Paleontology and Curator in the Museum of Paleontology.



SAMUEL P. WELLES, Ph.D., Lecturer in Paleontology and Principal Museum Paleontologist in the Museum of Paleontology.

Letters and Science List.—All undergraduate courses in Paleontology are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

* Not to be given, 1949-1950.

† To be given if a sufficient number of students enroll.

Departmental Major Adviser: Mr. Durham.

Preparation for the Major.—Two types of major programs are organized on the basis of relationships to geological sciences and to biological sciences.

Required: courses 1 (3) (or Geology 3 for transferring students) and 3 (3); Botany 1 (5) or Zoölogy 1A (4); Geology 1 (3); matriculation chemistry or physics. For the majors emphasizing geology, Engineering 1A-1B (3-3) and Mineralogy 4A (3) are also required; for the majors emphasizing vertebrate paleontology, Zoölogy 1A-1B (4-4) is also required.

Recommended: Chemistry 1A-1B (5-5); French and German; Geology 118 (4-6) for I (a) (see below); Anthropology 152 (3) for I (b) and II (b) (see below); Botany 16 (3) for II (c) (see below). A reading knowledge of French and German is essential for efficient advanced work and is required of candidates for the Ph.D. degree.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the departmental major.

The Major:

I. Paleontology and Geological Sciences.

(a) Emphasis on invertebrate paleontology; courses 102 (3), 111 (4), 112 (4); Geology 102A-102B (2-2), 103 (3); and at least five additional units of upper division courses chosen from Paleontology or Geology or Zoölogy 112 (summer seashore course) (4).

(b) Emphasis on vertebrate paleontology; courses 102 (3) or 112 (4), 125 (3), 126 (3), 127 (3); Geology 102A-102B (2-2), 103 (3); Zoölogy 113 (4) or 106 (4); and Zoölogy 114 (3) or Genetics 103 (3).

(c) Emphasis on Paleobotany: courses 102 (3), 120 (3), and 121 (3); Botany 110A-110B (6); Geology 102A-102B (2-2), 103 (3); and at least 4 units chosen from courses 111 (4), 112 (4), 126 (3), 127 (3).

II. Paleontology and Biological Sciences.

(a) Emphasis on invertebrate paleontology: courses 111 (4), 112 (4), 114 (4) or 116 (4) or 117 (4), 136 (5) or 137 (5) or 139 (5); Zoölogy 112 (4) (recommended: summer seashore course); and at least five additional units of upper division courses chosen from Paleontology or Zoölogy 110 (4), 114 (3), 123 (2), 125 (2), 125C (2), or Genetics 103 (3).

(b) Emphasis on vertebrate paleontology: courses 125 (3), 126 (3), 127 (3); Zoölogy 106 (4), 113 (4), 114 (3) or Genetics 103 (3); and at least four units chosen from courses 111 (4), 112 (4), 120 (3).

(c) Emphasis on paleobotany: courses 120 (3), 121 (3); Botany 110A-110B (6), 151 (3); Forestry 114 (3); and at least 6 units chosen from courses 102 (3), 111 (4), 112 (4), 126 (3), 127 (3), 137 (5).

Honor Students in the Upper Division.—Honors are awarded on the basis of excellent work in the major subject.

LOWER DIVISION COURSES

1. General Paleontology. (3) I and II.

Mr. Stirton

Two lectures and laboratory.

A survey of the history and classification of plants and animals.

Methods of interpretation of the fossil record. Fossils as evidence of the history of life; evolution of form and structure in plants and animals. Sequence of floras and faunas in the rocks.

3. Vertebrate Paleontology. (3) II.

Mr. Camp

Two lectures and laboratory. Enrollment limited to twenty.

Prerequisite: course 1, or Zoölogy 1A, or Geology 3, or Anthropology 1.

The vertebrate skeleton, vertebrate evolution, principles of vertebrate paleontology.

10. Principles of Paleontology. (3) I. Mr. Chaney
 Two lectures and one demonstration section; one or more field excursions half day Saturday. Enrollment limited to the size of classroom available. Not open to students who have credit in course 1.
 General principles of the history of life.
 Will be accepted in partial satisfaction of the natural science requirement for the Associate in Arts degree in the College of Letters and Science.

UPPER DIVISION COURSES

- *102. Stratigraphy. (3) II. _____
 Two lectures and laboratory.
 Prerequisite: course 1 or Geology 3, and Geology 103.
 Principles involved in the origin, composition, and relationships of stratified rocks.
111. Invertebrate Paleontology. (4) I. Mr. Durham
 (Formerly numbered 102A.)
 Two lectures and laboratory.
 Prerequisite: course 1, or Geology 1 and 3, or Zoölogy 1A. Paleobiology, morphology, and systematics of the invertebrates.
112. Stratigraphic Paleontology. (4) II. Mr. Kleinpell
 (Formerly numbered 104.)
 Two lectures and laboratory.
 Prerequisite: course 1 or Geology 3, and Zoölogy 1A or course 111.
 Principles of biostratigraphy and correlation.
114. Micropaleontology. (4) I. Mr. Kleinpell
 (Formerly numbered 105.)
 Two lectures and laboratory.
 Prerequisite: course 112.
 Paleobiology, taxonomy, and biostratigraphy of the microfossils, with emphasis on the foraminifers.
- *116. Morphology and Phylogeny of the Paleozoic Invertebrates. (4) I. _____
 Two lectures and laboratory.
 Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.
 Advanced studies in trilobites, brachiopods, graptolites, and pelmatozoans.
117. Morphology and Phylogeny of the Mesozoic and Cenozoic Invertebrates. (4) II. Mr. Durham
 Two lectures and laboratory.
 Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.
 Advanced studies in mollusks, echinoids, and corals.
120. Advanced Paleobotany. (3) I. Mr. Chaney
 Lectures and laboratory.
 Prerequisite: any lower division course in botany or geology, or consent of the instructor.
121. Tertiary Floras of Western America. (3) II. Mr. Chaney
 Lectures, proseminar, and laboratory.
 Prerequisite: course 120.
125. History of the Lower Vertebrates. (3) I. Mr. Camp
 (Formerly numbered 113.)
 Lectures, proseminar, and laboratory.
 Prerequisite: course 3 or Zoölogy 106.

* Not to be given, 1949-1950.

126. Evolution and Classification of the Mammals. (3) I. Mr. Savage
(Formerly numbered 114.)
Lectures, proseminar, and laboratory.
Prerequisite: course 3 or Zoölogy 106.
127. History and Paleocology of Higher Vertebrates. (3) II. Mr. Stirton
(Formerly numbered 115.)
Lectures, proseminar, and laboratory.
Prerequisite: course 126.
- *136. Paleontology and Stratigraphy of the Paleozoic and Mesozoic. (5) I.
Two lectures and laboratory, field trips.
Prerequisite: course 111.
Invertebrate paleontology and stratigraphy of the marine Paleozoic and
Early Mesozoic of the Pacific Coast.
137. Paleontology and Stratigraphy of the Late Mesozoic and Cenozoic. (5) I.
(Formerly numbered 103.) Mr. Durham
Three lectures and laboratory.
Prerequisite: course 111.
Invertebrate paleontology and stratigraphy of the marine Late
Mesozoic and Cenozoic of the Pacific Coast.
139. Cenozoic History of the West Coast of North America. (5) II.
(Formerly numbered 109.) Mr. Kleinpell
Three lectures and laboratory. Assigned readings.
Prerequisite: course 114.
Emphasis on correlation, sequence, and relationships of West Coast
foraminiferal faunas.
199. Special Study for Advanced Undergraduates. (1-5) I and II or in
field during the summer. The Staff (Mr. Stirton in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- *252. Seminar in Stratigraphy. (2) II. _____
Current literature and general problems.
253. Seminar in Micropaleontology. (2) I and II. Mr. Kleinpell
(Formerly numbered 203.)
Current literature and general problems.
254. Seminar in Mammalian Paleontology. (2) I. Mr. Stirton, Mr. Savage
(Formerly numbered 204.)
255. Seminar in Vertebrate Paleontology. (2) I and II. Mr. Camp
(Formerly numbered 205.)
256. Seminar in Invertebrate Paleontology. (2) I and II. Mr. Durham
(Formerly numbered 206.)
Current literature and general problems.
257. Seminar in Paleobotany. (2) I and II. Mr. Chaney
(Formerly numbered 207.)
Current literature and general problems.
299. Research in Paleontology. I and II. The Staff (Mr. Stirton in charge)
(Formerly numbered 208.)
Credit given according to amount of work completed.

MUSEUM OF PALEONTOLOGY

The Museum of Paleontology, situated in the Hearst Memorial Mining Building on the Berkeley campus, was organized in 1921, and is supported chiefly by funds donated by Miss Annie M. Alexander. The Museum maintains the largest

* Not to be given, 1949-1950.

fossil collections on the Pacific Coast, and makes use of these in teaching and research. The Matthew Memorial Library of Paleontology is a branch of the General Library which provides service to both faculty and students. Anyone wishing to make use of the facilities of the Museum should address the Director.

PHILOSOPHY

GEORGE P. ADAMS, Ph.D., Mills Professor of Mental and Moral Philosophy and Civil Polity.

WILLIAM R. DENNES, D.Phil., Professor of Philosophy.

*JACOB LOEWENBERG, Ph.D., Professor of Philosophy.

DONALD S. MACKAY, Ph.D., Professor of Philosophy (Chairman of the Department).

PAUL MARHENKE, Ph.D., Professor of Philosophy.

STEPHEN C. PEPPER, Ph.D., Professor of Philosophy and Aesthetics.

EDWARD STRONG, Ph.D., Professor of Philosophy.

KARL W. ASCHENBRENNER, Ph.D., Assistant Professor of Philosophy.

BENSON MATES, Ph.D., Assistant Professor of Philosophy.

Fundamental ideas and ideals play an indispensable part in the life and activities of each culture area and epoch. They reflect the manner in which each age organizes its knowledge and the major interests of its civilization. They disclose the problems generated by the impact of traditional habits of life and thought upon the requirements imposed by new conditions and by fresh discoveries of knowledge. They portray the efforts of reflective thought to formulate more adequate concepts and ideals for the organization and interpretation of experience.

Courses offered by the Department of Philosophy provide an opportunity for the student to become acquainted with the leading ideas in terms of which men attempt at the present time to understand the broader fundamental aspects of their world and their civilization.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Aschenbrenner.

Preparation for the Major.—Courses 20A–20B and 12A.

The Major.—Upper division courses in philosophy are arranged in three groups, A, B, and C.

Of the 24 units required for the major, 6 must be taken from courses in Group A, 6 from courses in Group B, and 6 from courses in Group C. The student is at liberty to select the remaining 6 units from any courses in the department, and may, with the approval of the departmental adviser, take 3 of these units in another department, provided the course selected is regarded as relevant to the major.

LOWER DIVISION COURSES

6A–6B. Introduction to Philosophy. (3–3) Yr. Beginning each semester.

Mr. Adams, Mr. Aschenbrenner, Mr. Dennes, Mr. Mackay,

Mr. Mates, Mr. Pepper, Mr. Strong

Weekly section meetings for discussion and written work.

Course 6A is prerequisite to 6B. Two sections in 6A will be given in the spring semester and two sections of 6B in the fall semester.

* Absent on leave, 1949–1950.

SOPHOMORE COURSES

- 12A-12B. Logic. (3-3) Yr. Mr. Marhenke, Mr. Mates
 20A-20B. History of Philosophy. (3-3) Yr. Mr. Dennes, Mr. Mackay
 (Formerly numbered 10A-10B.)
 I. From the Pre-Socratics to Plotinus.
 II. From the Scholastics to Kant.
 30. Scientific Method. (3) II. Mr. Marhenke
 (Formerly numbered 14.)

UPPER DIVISION COURSES

General Prerequisites.—Students enrolling in any upper division course must have completed 6 units in course 6A-6B or 20A-20B.

GROUP A

Courses concerned with a critical analysis and appraisal of specific human interests such as art, literature, morality, religion, science, and society.

104. Ethics. (3) I. Mr. Adams
 Moral Values: An analysis of the Good and the Right.
 *108. Social Philosophy. (3) II. Mr. Dennes
 An examination of the fundamental notions involved (a) in the explanation, and (b) in the evaluation, of social structures and processes. Basic problems of human personality and values in relation to their social matrix.
 *112. Philosophy of Religion. (3) II. Mr. Adams
 The nature and the validity of religious ideas.
 128. Political Philosophy. (3) II. Mr. Mackay
 Conceptions of the State in relation to the values of freedom and social order; the idea of constitutional democracy in its historical development.
 136A-136B. Aesthetics. (3) Yr. Mr. Pepper, Mr. Aschenbrenner
 A study of the nature of the aesthetic experience and of the work of art with detailed applications to music, the visual arts, and literature. Course 136A is prerequisite to 136B, but students majoring in the arts may, at the discretion of the instructor, be admitted without further prerequisites.
 *136C. Aesthetics. (3) I. Mr. Strong
 A study of values in applied and fine arts, and of the place and role of art in human affairs.
 At the discretion of the instructor in course 136A, 136B, or 136C, the general prerequisites may be waived for major students in literature or in the fine arts. Course 136C together with either 136A or 136B will be counted as a year course of 6 units in aesthetics. Course 136C may be taken in addition to both 136A and 136B without loss of credit.
 *146. Philosophy in Literature. (3) II. Mr. Loewenberg
 At the discretion of the instructor the general prerequisites may be waived for major students in literature or in the fine arts.

GROUP B

Courses dealing with the methods of reflective thinking and the more general features of experience.

- *102. Recurrent Types of Philosophy. (3) I. Mr. Loewenberg
 *111. Metaphysics. (3). Mr. Loewenberg
 113. Logic. (3) II. Mr. Marhenke, Mr. Mates
 Prerequisite: course 12A or its equivalent.
 114. Theory of Knowledge. (3) I. Mr. Marhenke

* Not to be given, 1949-1950.

- *122. Philosophy of Mind. (3) I. Mr. Adams
 123. Man and Nature. (3) II. Mr. Adams
 A critical survey of ideas concerning the relation between man and nature, within the western tradition.
 *124. Philosophy of Science. (3) I. Mr. Marhenke
 125. Theory of Value. (2) I. Mr. Pepper
 Enrollment limited to twenty-five students.
 A study of the sources of value with particular emphasis on purposive behavior, and on principles of evaluation in relation to both individual and social problems.
 133. Philosophy of Language. (3) I. Mr. Mates
 Prerequisite: six units in 6A-6B or 20A-20B; and 12A.
 *135A-135B. Contemporary Tendencies in Philosophy. (3-3) Yr. ———
 147. Theory of Historical Inquiry. (3) I. Mr. Strong

GROUP C

Courses dealing with individual thinkers and epochs in the history of ideas. Course 20A-20B or its equivalent is prerequisite to courses in this group.

- *103. Philosophy of the Nineteenth Century. (3) I. Mr. Mackay
 105. Kant. (3) I. Mr. Aschenbrenner
 *115. Medieval and Early-Modern Thought. (3) II. Mr. Strong
 116. Plato. (3) I. Mr. Mackay
 117. Aristotle. (3) II. Mr. Mates
 118. Spinoza. (3) II. Mr. Mackay
 119A-119B. British Empiricism. (3-3) Yr. Mr. Aschenbrenner, Mr. Mates
 (Formerly numbered 119.)
 119A. With special reference to Locke and Berkeley.
 119B. With special reference to Hume.
 *121. Hobbes. (3) II. ———
 *126. Hellenistic Philosophy: The Stoics, Epicureans, and Skeptics. (3) I. Mr. Mates
 *129. Leibniz. (3) I. Mr. Marhenke
 130. Materialism and Naturalism. (3) II. Mr. Strong
 Historical and critical studies of the chief philosophical materialists from Democritus to Dewey.
 *145. American Philosophy. (3) II. Mr. Mackay
 199. Special Study for Advanced Undergraduates. (1-4) I and II.
 The Staff (Mr. Mackay in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

204. Seminar in Ethics. (2) I. Mr. Adams
 *210A-210B. Seminar in Hegel's Phenomenology of Mind. (2-2) Yr. Mr. Loewenberg
 *211. Seminar in Metaphysics. (2) II. Mr. Pepper
 213A-213B. Seminar in Logic. (2-2) Yr. Mr. Marhenke
 *214. Seminar in the Theory of Knowledge. (3) II. Mr. Marhenke
 *216. Seminar in Plato. (2) I. Mr. Mackay
 *218A-218B. Seminar in Semantics. (2-2) Yr. Mr. Mates
 220. Seminar in Pragmatism. (2) I. Mr. Mackay

* Not to be given, 1949-1950.

225. Seminar: Theory of Value. (2) II. Mr. Pepper
 *231. Seminar on the Problem of Time. (2) I. Mr. Mackay
 232. Seminar in Philosophical Naturalism. (2) II. Mr. Dennes
 *236. Aesthetics from the Metaphysical Standpoint. (2) I. Mr. Pepper
 *237. Seminar in the Philosophy of Art. (2) Mr. Loewenberg
 238. Seminar in Aesthetics. (2) I. Mr. Aschenbrenner
 *247. Seminar in Theories of History. (2) II. Mr. Strong
 250. Special Studies. (1-6) I and II. The Staff (Mr. Mackay in charge)
 Enrollment is ordinarily restricted to students who have been admitted to candidacy for the doctor's degree.

PHYSICAL EDUCATION

FREDERICK W. COZENS, Ph.D., Professor of Physical Education and Director of Physical Education (Chairman of the Department).

†PAULINE HODGSON, Ph.D., Professor of Physical Education.

SARAH R. DAVIS, A.B., Assistant Professor of Physical Education, Emeritus.

ANNA ESPENSCHADE, Ph.D., Associate Professor of Physical Education.

*FRANKLIN M. HENRY, Ph.D., Associate Professor of Physical Education.

LOUISE S. COBB, Ph.D., Associate Supervisor of Physical Education.

LUCILE K. CZARNOWSKI, M.S., Associate Supervisor of Physical Education.

MARIE H. GLASS, A.B., Associate Supervisor of Physical Education.

JACK E. HEWITT, Ed.D., Associate Supervisor of Physical Education.

RALFE D. MILLER, M.A., Associate Supervisor of Physical Education.

HEBER A. NEWSOM, M.A., Associate Supervisor of Physical Education.

CHARLES A. PEASE, A.B., Associate Supervisor of Physical Education.

HENRY A. STONE, M.S., Associate Supervisor of Physical Education.

ELEANOR E. BARTLETT, A.B., Assistant Supervisor of Physical Education.

FREDERICA BRENHARD, M.S., Assistant Supervisor of Physical Education.

CAROLINE W. COLEMAN, M.A., Assistant Supervisor of Physical Education.

KATHERINE F. GROSS, M.A., Assistant Supervisor of Physical Education.

CHARLES J. KEENEY, A.B., Assistant Supervisor of Physical Education.

EDGAR NEMIR, A.B., LL.B., Assistant Supervisor of Physical Education.

JOAN E. FARRELL, M.S., Junior Supervisor of Physical Education.

LANCE FLANAGAN, A.B., Junior Supervisor of Physical Education.

KATHARINE GILCOYNE, M.A., Junior Supervisor of Physical Education.

HAROLD HUGH MUMBY, A.B., Junior Supervisor of Physical Education.

RUTH E. VAN DENBERGH, B.S., Junior Supervisor of Physical Education.

MARIAN A. WATSON, M.A., Junior Supervisor of Physical Education.



CLINTON W. EVANS, B.S., Lecturer in Physical Education.

LYNN O. WALDORF, A.B., Lecturer in Physical Education.

The incidental fee payable by all students at the time of registration entitles students to the use of gymnasia, swimming pools, showers, towels, lockers, tennis courts, and the athletic fields, also to the use of costumes for certain physical education activities, including swimming.

Recreational opportunities.—At Hearst Gymnasium and at the Gymnasium for Men, rooms, courts, swimming pools, sports fields, and equipment for games

* Not to be given, 1949-1950.

† Miss Hodgson will serve as executive officer in the Division for Women.

‡ In residence spring semester only, 1949-1950.

and sports are available to students of the University who wish an opportunity for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit. At Hearst Gymnasium the Women's Athletic Association and the department cooperate in offering opportunities for a wide variety of activities. Further information may be obtained from the Secretary, Room 200, Hearst Gymnasium.

Fees.—The fee for ice skating is \$4.50.

Fines.—Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department: (a) Failure to return equipment or clothing on or before the date posted for such return at the end of each semester, or at the end of each special session of the University, or failure to return athletic supplies (balls, bats, etc.) on the date of issue, \$1 for each twenty-four hours until the full purchase price of the article has been reached. (b) Failure to meet the appointment for the physical examination, \$2. (c) Overnight use of dressing locker, \$2. Failure to empty locker within designated time, \$2.

LOWER DIVISION COURSES FOR MEN

1. Physical Training, Recreation, and Competitive Sports. (½) I and II.

Sections meet twice weekly at various hours. M Tu W Th. The Staff

Men may enroll for credit in class instruction, in intramural or intercollegiate athletics. The following activities are open to those found properly qualified: archery†, baseball, softball baseball, basketball, boxing, wrestling, fencing, crew, American football, touch football, rugby football, golf, gymnastics, body building, tumbling, handball, squash, figure skating†, badminton, hockey, soccer, swimming, diving, tennis, track, modern dance†, folk dancing†, social dancing†, trampoline, volleyball, and weight-lifting. Special guidance and facilities are provided for men wishing to correct bodily defects or accomplish specific development.

A physical examination is required of all men entering the University, and a special medical examination is demanded of all athletes prior to training for, or participation in, intramural or intercollegiate competition.

LOWER DIVISION COURSES FOR WOMEN

Students will enroll at Hearst Gymnasium during the first week of the semester.

26. Physical Education Activities. (½) I and II.

The Staff

Sections meet twice weekly at various hours.

The following activities are offered in elementary, intermediate, and advanced grades for women who are in good physical condition.

The classes may be taken either with or without credit.

Sports: archery†, badminton, basketball, fencing, golf, hockey, figure skating†, lifesaving, swimming, tennis, field sports, skiing fundamentals, volleyball-softball.

Dancing: modern dance†, folk dancing†, and social dancing†.

General Exercise: gymnastics, tumbling and apparatus, rhythmic work, and training in standing and walking correctly. Designed especially for students who wish to maintain physical fitness.

Individual Exercise: group exercises adapted to individual needs.

LOWER DIVISION COURSES FOR MEN AND WOMEN

Students will enroll for courses 26, 54, and 85A at Hearst Gymnasium during the first week of the semester.

20. Introduction to Physical Education. (1) I and II.

Mr. Cozens

An interpretation of the field designed to give the prospective major student an understanding of its scope.

† See Lower Division Courses for Men and Women.

26. Physical Education Activities. ($\frac{1}{2}$) I and II. The Staff
Sections meet twice weekly at various hours.
Archery, folk dancing, figure skating, modern dance, social dancing.
54. Rhythmic Basis of Dance and Allied Arts. (2) II. Miss Czarnowski
(Formerly numbered 35.)
This course is planned for students interested in dance, music, and art.
Consideration given to nature and function of rhythm, rhythmic analysis
and notation, rhythmic form in the temporal and spatial arts.
- 85A. First Aid. (1) I and II. The Staff
(Formerly numbered 5A.)
Standard course. Sections meet two hours weekly.
Upon successful completion of the course, the Red Cross Certificate is
awarded.
- *85B. Advanced First Aid. (No credit.) I and II. The Staff
(Formerly numbered 5B.)
Sections meet two hours weekly for eight weeks.
Upon successful completion of the course, the Red Cross Certificate is
awarded.

UPPER DIVISION COURSE FOR MEN

171. Conditioning of Athletes and Care of Injuries. (2) I. Mr. Stone
(Formerly numbered 318.)
Lecture and a three-hour laboratory period.
Prerequisite: course 85A, Physiology 1 or Anatomy 102.
Modern principles and practice in conditioning and care of athletes;
individual variation and needs as to sleep, diet, health, and activity habits;
care of injuries with special emphasis on therapy, taping, and protective
equipment.

UPPER DIVISION COURSES FOR WOMEN

- 160A-160B. Theory of Dance. (3-3) Yr. Miss Czarnowski
Lectures and laboratory.
Prerequisite: course 54 and Psychology 1A.
- 165A. Theory of Group Athletics. (3) I. Miss Espenschade, Miss Hodgson
Lectures and laboratory.
Prerequisite: course 101 is recommended.
- 165B. Theory of Gymnastics. (3) II. Miss Cobb
Lectures and laboratory.
Prerequisite: course 101 is recommended. Course 165A is not prerequi-
site to 165B.
166. Theory of Individual Athletics. (2) II.
Mrs. Glass, Miss Coleman, Miss Bartlett
Prerequisite: a working knowledge of the activities included.

UPPER DIVISION COURSES FOR MEN AND WOMEN

101. Kinesiology and Body Mechanics. (4) I. Miss Bartlett
Lectures and laboratory.
Prerequisite: Physiology 1, 1L, and Anatomy 102.
The study and application of physical structure and muscular move-
ments in various physical education activities. Description and application
of certain anatomical concepts and physical laws to joint and muscular
action. An analysis of certain deviations from physical growth norms.
102. Corrective Physical Education. (3) II. Miss Bartlett
Prerequisite: course 101.
Development of programs for those individuals whom the physician has

* Not to be given, 1949-1950.

diagnosed as functionally deficient; particular attention to poor circulation, spinal deviations, etc. Analysis of causes underlying these conditions and direction of students into activities suitable to their needs.

105. **Physiological Hygiene.** (4) II. Mr. Henry
Lectures and laboratory.
Prerequisite: high school chemistry, Home Economics 10, Physiology 1, 1L, Public Health 5A.
The physiology of exercise; diet, ventilation, training, fatigue, and health in relation to physical activity. Individual differences in cardiovascular and respiratory function.
110. **Psychologic Bases of Physical Activity.** (2) I. Miss Espenschade
Prerequisite: Psychology 1A.
Motor learning, facilitation and inhibition, motivation, set, reaction time, coordination efficiency, fatigue, emotion, and personality in relation to physical activity; the psychology of athletic performance.
130. **History and Principles of Physical Education.** (3) II. Miss Cobb
Prerequisite: course 20, Physiology 1, 1L, and Psychology 1A.
131. **The Organization and Administration of Physical Education.**
131M (for Men). (4) I. Mr. Cozens, Mr. Stone
131W (for Women). (3) I. Mr. Cozens, Miss Hodgson
Prerequisite: course 130.
Organization of the instructional, intramural, recreational, and competitive programs; criteria for the evaluation and selection of activities offered in each. The supervision and administration of gymnasium facilities and play areas; cost and maintenance of equipment; departmental organization, regulations, and policies.
135. **Tests and Measurements in Physical Education.** (3) I. Mr. Cozens
Prerequisite: Education 110 or consent of the instructor.
The historical background of measurement in physical education; statistical techniques to be used in scoring tests; the construction and uses of tests; interpretation of results; evaluation of measures now available in the field; the administration of a testing program.
140. **Community Recreation.** (2) II. Mrs. Glass
Prerequisite: upper division standing.
The meaning and scope of recreation in the leisure time life of the American people. Purposes and programs of agencies concerned with recreation. Consideration of special types: industrial, commercial, home, and neighborhood. Problems of leadership. Critical evaluation of representative surveys.
Course 140 is not open to students who have taken course 143A or 143B; and the latter are not open for full credit to students who have taken course 140.
- 143A. **Theory and Principles of Recreation.** (3) I. Miss Cobb
Prerequisite: upper division standing.
The meaning and significance of leisure in modern society; essential characteristics and uses of recreation; theories of play; the recreation movement in the United States.
- 143B. **The Organization and Administration of Recreation.** (3) II.
Prerequisite: course 143A. Mr. Miller
Community interrelationships affecting recreation; the recreation program; areas and facilities and their operation, recreation organization; financial support, records, personnel administration, publicity, and public relations.

144A. Field Laboratory Course. (No credit.)

Mrs. Glass, Mr. Newsom, Mr. Pease
Prerequisite: completion of the lower division requirements of the group major in recreation.

A minimum of six weeks' full-time field experience, or its equivalent, in a variety of recreational assignments based on the needs and experience of the student.

144B. Field Laboratory Course. (No credit.)

Prerequisite: course 144A. Mrs. Glass, Mr. Newsom, Mr. Pease

A continuation of course 144A including additional field experience in recreational activities.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. Cozens in charge)

Prerequisite: senior standing and consent of the department. Only specially qualified students will be admitted.

METHODS COURSES FOR MEN

301A. The Theory and Teaching of Gymnastics and Mass Athletics.

(1) I and II. Mr. Pease

One lecture and two laboratory hours to be arranged.

Prerequisite: course 1 in body building.

303. The Theory and Teaching of Track and Field Events. (1) I.

One lecture and two laboratory hours to be arranged. Mr. Keeney

304. The Theory and Teaching of Baseball. (1) II.

Mr. Evans

One lecture and two laboratory hours to be arranged.

305. The Theory and Teaching of Basketball. (1) I.

Mr. Newsom

One lecture and two laboratory hours to be arranged.

Prerequisite: course 1 in basketball.

306. The Theory and Teaching of Court Sports. (1) I.

Mr. Miller

One lecture and two laboratory hours to be arranged.

Prerequisite: course 1 in tennis or consent of the instructor.

308. The Theory and Teaching of Boxing and Wrestling. (1) I and II.

Prerequisite: course 1 in wrestling. Mr. Stone, Mr. Nemir

310. The Theory and Teaching of Swimming, Diving, and Water Polo. (1)

I and II. Mr. Hewitt

One lecture and two laboratory hours to be arranged.

Prerequisite: course 1 in swimming.

311. The Theory and Teaching of Lifesaving and Water Safety. (1) I and II.

One lecture and two laboratory hours to be arranged. Mr. Hewitt

Prerequisite: course 310 or the equivalent.

313. The Theory and Teaching of American Football. (1) II. Mr. Waldorf

One lecture and two laboratory hours to be arranged.

320. Theory and Practice of Officiating in Football and Basketball. (1) I.

One lecture and two laboratory hours to be arranged. Mr. Newsom

†322. The Theory and Teaching of Field Sports. (1) II. Mr. Newsom

One lecture and two laboratory hours to be arranged.

Prerequisite: consent of the instructor.

METHODS COURSE FOR MEN AND WOMEN

343. The Theory and Teaching of Recreational Activities. (1) II.

Mr. Pease, Miss Watson

Lectures, demonstrations, and reading assignments.

Discussion of and participation in the organization and direction of recreational activities including social and group games, rhythms and dances, parties for mixed groups, and games of low organization.

† To be given if a sufficient number of students enroll.

METHODS COURSES FOR WOMEN

333. Theory and Teaching of Lifesaving and Water Safety (Women). (1) I and II. Miss Bernhard, Mrs. Glass
Prerequisite: Red Cross Senior Life Saving Certificate.
Instruction and practice in the techniques of swimming, of diving, and of lifesaving; the organization of this material for teaching; methods of presentation to students; standards for grading performance. A written and a practical examination are required.
360. The Teaching of Physical Education. (2) II. Miss Hodgson
One conference hour a week, and one period of directed teaching daily for ten weeks.
Prerequisite: courses 130, 160A, 165A-165B.

GRADUATE COURSES FOR MEN AND WOMEN

- 260A-260B. Seminar in Physical Education. (2-2) Yr. Beginning each semester. Mr. Cozens, Miss Espenschade, Miss Hodgson, Mr. Henry
The meaning, methods, and techniques of research procedure as applied to physical education; a critical review of selected studies, literature, practices and procedures in the field; application of this training to a particular problem in the field.
- †231. Administration of Physical Education. (2) II. Mr. Cozens
290. Research. (1-6) I and II.
● Mr. Cozens, Miss Espenschade, Mr. Henry, Miss Hodgson

PHYSICS

- LUIS W. ALVAREZ, Ph.D., Professor of Physics.
RAYMOND T. BIRGE, Ph.D., Professor of Physics (Chairman of the Department).
ROBERT B. BRODE, Ph.D., Professor of Physics.
FRANCIS A. JENKINS, Ph.D., Professor of Physics.
ERNEST O. LAWRENCE, Ph.D., Sc.D., LL.D., Professor of Physics and Director of the Radiation Laboratory.
VICTOR F. LENZEN, Ph.D., Professor of Physics.
LEONARD B. LOEB, Ph.D., Professor of Physics.
EDWIN M. McMILLAN, Ph.D., Professor of Physics.
EMILIO SEGRÈ, Ph.D., Professor of Physics.
HARVEY E. WHITE, Ph.D., Professor of Physics.
GIAN C. WICK, Ph.D., Professor of Physics.
RALPH S. MINOR, Ph.D., Professor of Physics and Optometry, Emeritus.
WILLIAM H. WILLIAMS, Graduate, United States Military Academy, Professor of Physics, Emeritus.
HIRAM W. EDWARDS, Ph.D., Associate Professor of Physics.
AUGUST C. HELMHOLTZ, Ph.D., Associate Professor of Physics.
WOLFGANG PANOFSKY, Ph.D., Associate Professor of Physics.
WILSON M. POWELL, Ph.D., Associate Professor of Physics.
GEOFFREY F. CHEW, Ph.D., Assistant Professor of Physics.
WILLIAM B. FRETTER, Ph.D., Assistant Professor of Physics.
HAROLD W. LEWIS, Ph.D., Assistant Professor of Physics.
OWEN CHAMBERLAIN, Ph.D., Instructor in Physics.

† To be given if a sufficient number of students enroll.

HOWARD A. WILCOX, Ph.D., Instructor in Physics.
 THEODORE C. MERKLE, JR., M.S., Associate in Physics.
 HERSCHEL SNODGRASS, M.S., Associate in Physics.
 MARY B. SUMMERFIELD, M.A., Associate in Physics.



ROBERT SERBER, Ph.D., Professor of Physics, Radiation Laboratory.
 ROBERT L. THORNTON, Ph.D., Professor of Physics, Radiation Laboratory.
 BURTON J. MOYER, Ph.D., Lecturer in Physics.
 CHAIM RICHMAN, Ph.D., Lecturer in Physics.

MEDICAL PHYSICS

JOSEPH G. HAMILTON, M.D., Associate Professor of Medical Physics, Experimental Medicine, and Radiology and Director of the Crocker Laboratory.
 HARDIN B. JONES, Ph.D., Associate Professor of Medical Physics and Physiology and Assistant Director of the Donner Laboratory.
 JOHN H. LAWRENCE, M.D., Associate Professor of Medical Physics and Experimental Medicine and Director of the Donner Laboratory.
 JOHN W. GOFMAN, M.D., Ph.D., Assistant Professor of Medical Physics.
 KENNETH SCOTT, Ph.D., Assistant Professor of Experimental Radiology.
 CORNELIUS A. TOBIAS, Ph.D., Assistant Professor of Medical Physics.
 R. LOWRY DOBSON, M.D., Instructor in Medical Physics.

Letters and Science List.—All undergraduate courses in physics (except 129 at Davis) are included in the Letters and Science List of Courses. For regulations, see page 85.

Departmental Major Advisers: Mr. Loeb, Mr. Helmholtz, Mr. Wilcox.

Preparation for the Major.—Required: Courses 4A, 4B, 4C, or the equivalent (under special circumstances courses 2A–2B and 3A–3B may be accepted); Chemistry 1A–1B, Mathematics C, 3A–3B, 4A–4B, or their equivalents. Recommended: Mathematics 8, and a reading knowledge of French and German.

The Major.—The major must include courses 105A–105B, 108B, 110A–110B, 115, 121, and Mathematics 110A–110B (Mathematics 119A–119B may be substituted for 110A–110B). The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in physics.

Engineering Physics.—The College of Engineering with the coöperation of the Physics Department offers a curriculum in engineering physics leading to the degree of Bachelor of Science. Major Adviser, Mr. Fretter. (See page 112.)

Honors.—Honor students may do special work in course 199. Other special courses will not be given.

LOWER DIVISION COURSES

Courses 4A, 4B, 4C are fundamental and are designed to meet the needs of students whose major is physics and of students preparing for applications of physics in the Colleges of Engineering and Chemistry. After completing 4A, the order of taking 4B, 4C is immaterial.

Prerequisite for all lower division courses except course 10: (1) either high school physics or chemistry or Physics 10, (2) trigonometry (may be taken concurrently). Prerequisite for course 10: elementary algebra and plane geometry.

- 2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.
 Mr. Edwards, Mr. Snodgrass, Mrs. Summerfield, Mr. White
 Three lectures and one discussion section weekly.
 Elective in the College of Letters and Science. Required for premedical students and students in architecture.
 Mechanics, properties of matter, heat, sound; light, electricity and magnetism, atomic and nuclear physics.
- 3A-3B. General Physics Laboratory. (1-1) Yr. Beginning each semester.
 Mr. Snodgrass
 Required for premedical students. Recommended for all students who elect course 2A-2B.
 Mechanics, properties of matter, heat, sound, light, electricity and magnetism, atomic and nuclear physics. Experimental work planned to accompany the lectures in course 2A-2B.
- 4A. General Physics. (4) I and II.
 Mr. Chamberlain, Mr. Fretter, Mr. Lenzen, Mr. Merkle, Mr. Wilcox
 Three lectures and one three-hour laboratory period.
 Prerequisite: Mathematics 3A-3B or its equivalent. Mathematics 3B may be taken concurrently.
 Open to students in all colleges. Together with course 4B-4C, required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.
 Mechanics, properties of matter.
- 4B. General Physics. (4) I. Mr. Loeb, Mr. Moyer, Mrs. Summerfield
 Three lectures and one three-hour laboratory period.
 Prerequisite: course 4A.
 Open to students in all colleges. Required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.
 Electricity and magnetism.
- 4C. General Physics. (4) II. Mr. Moyer, Mr. Powell, Mrs. Summerfield
 Three lectures and one three-hour laboratory period.
 Prerequisite: course 4A.
 Open to students in all colleges. Required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.
 Heat, wave motion, sound, and light.
10. Descriptive Introduction to Physics. (3) II. Mr. Wilcox
 A brief presentation of some of the more important phenomena in physics, with experimental illustrations. Open to students with or without high school physics, but not open to those who have had a course in college physics.
24. Supplementary Laboratory Courses in General Physics. (1)
 Lower Division Staff (Mr. Lenzen in charge)
 These courses are intended primarily for students entering the University with partial credit in general physics and are part of the regular work of courses 4A, 4B, 4C in the semester indicated for each. Students should enroll under one or more of the following numbers:
 24A. Mechanics and Properties of Matter. (1) I and II.
 24B. Electricity and Magnetism. (1) I.
 24C. Heat, Wave Motion, Sound, and Light. (1) II.
- 32-34. Supplementary Lecture Courses in General Physics.
 Lower Division Staff (Mr. Lenzen in charge)
 These courses are intended primarily for students entering the University with partial credit in general physics. Courses 32A, 32B cover part of

the lecture work in 2A-2B, whereas courses 34A, 34B, 34C cover the lecture work only of 4A, 4B, 4C, respectively. Students should enroll under one or more of the following numbers:

- 32A. Mechanics, Properties of Matter, Sound, and Heat. (1-3) I and II.
- 32B. Light, Electricity and Magnetism. (1-3) I and II.
- 34A. Mechanics and Properties of Matter. (3) I and II.
- 34B. Electricity and Magnetism. (3) I.
- 34C. Heat, Wave Motion, Sound, and Light. (3) II.
- 41A. Properties of Matter. (1) I and II.

Mr. Fretter, Mr. Lenzen, Mr. Wilcox
Equivalent to part of 4A. Students enrolled under 41A will attend the lectures and laboratory of 4A, but will be held only for the portion of that course covering properties of matter (formerly included in course 1B).

- 41B. Heat. (1) II. Mr. Moyer, Mr. Powell
Equivalent to part of 4C. Students enrolled under 41B will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering heat (formerly included in course 1B).

- 41D. Supplementary Lecture and Laboratory Course in General Physics. (3) II. Mr. Moyer, Mr. Powell
Equivalent to part of 4C. Students enrolled under 41D will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering wave motion, sound, and light (formerly included in course 1D).

UPPER DIVISION COURSES

Courses 4A, 4B, 4C and differential and integral calculus are prerequisite to all upper division courses except course 108A-108B, Sec. 2.

- 104A-104B. Vector Analysis. (3-3) Yr. Mr. Chew, Mr. Lewis
- 104A. I: Mr. Lewis; II: Mr. Chew.
- 104B. II: Mr. Lewis.

Elements of vector and tensor analysis and their applications to physics, particularly those branches in which the idea of a field is fundamental. Emphasis on the importance of an invariantive formulation of physical laws.

- 105A-105B. Analytic Mechanics. (3-3) Yr. Beginning each semester. Mr. Helmholtz, Mr. Moyer, Mr. Wilcox
- 105A. I: Mr. Helmholtz, Mr. Wilcox; II: Mr. Moyer.
- 105B. I: Mr. Moyer; II: Mr. Helmholtz.
- Fundamental principles of Newtonian mechanics.

- 108A. Geometrical Optics. (3) I. Mr. White
Lectures and laboratory.
Prerequisite: courses 2A-2B, 3A-3B.

Geometrical methods applied to the optics of mirrors, prisms, and lenses.

- 108B. Physical Optics. (3) I and II. Mr. Alvarez, Mr. Powell, Mr. Wilcox
Lectures, I: Sec. 1, Mr. Powell; II: Sec. 1, Mr. Alvarez; Sec. 2, Mr. Wilcox.

Two lectures and one three-hour laboratory period.
Section 2 open only to students in optometry.
Course 108A is not prerequisite to 108B.

The phenomena of diffraction, interference, and polarization of light, and their applications.

- 110A-110B. Electricity and Magnetism. (3-3) Yr. Beginning each semester. Mr. Brode, Mr. Powell, Mr. Thornton
- 110A. I: Mr. Thornton; II: Mr. Brode.
- 110B. I: Mr. Brode; II: Mr. Powell.
- Elementary and mathematical theory of electrostatics, magnetostatics,

magnetism, steady and varying currents, electron theory, and electromagnetic waves.

- 110C. Advanced Electrical Laboratory. (1) I and II.
Prerequisite: course 121. Mr. Chamberlain, Mr. Panofsky
The use and calibration of precision electrical instruments and electronic devices.
- 110D. Modern Physics Laboratory. (1) I and II.
Prerequisite: course 121. Mr. Chamberlain, Mr. Panofsky
The experimental foundation for the theory of atomic structure.
112. Heat. (3) I and II. Mr. Fretter, Mr. Loeb
I: Mr. Fretter; II: Mr. Loeb.
The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.
114. Sound. (2) I. Mr. Richman
Theory of vibrations and wave motion, with applications to acoustics.
115. Introduction to Quantum Mechanics. (2) I and II.
I: Mr. McMillan; II: Mr. Richman. Mr. McMillan, Mr. Richman
Prerequisite: courses 105A, 121.
The classical background, basic ideas and methods of quantum mechanics, with applications to atomic physics.
121. Introduction to Atomic Structure. (3) I and II.
I: Mr. Loeb; II: Mr. Thornton. Mr. Loeb, Mr. Thornton
An introduction to atomic physics treating cathode and positive rays, the electron, thermionic emission, the photoelectric effect, the structure of the atom, and the interpretation of spectra and X rays.
122. Discharge Through Gases. (3) II. Mr. Loeb
Currents in gases, nature and property of ions, ionization by collision, spark, arc, and glow discharges.
124. Radioactivity and Nuclear Structure. (3) I and II.
I: Mr. Alvarez; II: Mr. Segrè. Mr. Alvarez, Mr. Segrè
Prerequisite: course 121.
Discovery of radioactivity, nature of radioactivity, α , β , and γ rays, theory of successive transformation, artificial transmutations, nuclear structure.
125. Introduction to Medical Physics. (1) I. Mr. Jones, Mr. J. H. Lawrence
Application of recent advances in nuclear physics to biological and medical problems.
126. Biological Applications of Artificial Radioactivity. (2) II.
Mr. Hamilton, Mr. Scott
Prerequisite: Chemistry 1A-1B, course 2A-2B, and one of the following: Zoology 1A-1B, Physiology 1, 1L, or Botany 1.
The theory and methods used in the applications of artificial radioelements to research problems in the biological sciences.
- 126L. Biological Applications of Artificial Radioactivity. (1) II.
Laboratory work to accompany course 126. Mr. Hamilton, Mr. Scott
128. Measurement of Radiations. (1) I. Mr. Tobias
Prerequisite: courses 2A-2B, 3A-3B, or equivalent and consent of the instructor.
An introduction to the measurement of nuclear radiations and the interaction of radiations with matter. Special attention is given to biological methods and dosimetry.

- 128L. Measurement of Radiations. (2) I. Mr. Tobias
Prerequisite: courses 2A-2B, 3A-3B, or equivalent and consent of the instructor.
Laboratory work to accompany course 128.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Birge in charge)
All special work of upper division grade not included in courses announced above. Designed to introduce students to advanced topics and to the technique and methods of research. Credit value to be fixed in each case.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- 204A-204B. The Reduction of Observations. (2-2) Yr. Mr. Birge
Instruments and methods, analytical and graphical, employed in reduction of data to final results, and errors of the results—including numerical interpolation and integration, theory of least squares, theory of errors.
- 205A. Advanced Dynamics. (3) I. Mr. Lenzen
Prerequisite: course 105A-105B.
The generalized methods of Lagrange, Hamilton, and Jacobi.
- 205B. Advanced Dynamics. (3) II. Mr. Lenzen
Prerequisite: course 105A-105B or equivalent. Course 205A is not prerequisite to 205B.
Theory of elasticity and hydrodynamics.
- 208A-208B. Advanced Physical Optics. (2-2) Yr. Beginning each semester.
208A: Mr. White; 208B: Mr. Jenkins. Mr. Jenkins, Mr. White
Prerequisite: course 108B.
A résumé of the more important experimental and theoretical material concerning the properties of light, when treated as a wave motion.
- 210A-210B. Theory of Electricity and Magnetism. (3-3) Yr. Beginning each semester. Mr. Chew, Mr. Panofsky, Mr. Richman
210A. I: Mr. Panofsky; II: Mr. Chew.
210B. I: Mr. Richman; II: Mr. Panofsky.
Prerequisite: course 110A-110B and a working knowledge of differential equations.
Classical description of the electromagnetic field, including special relativity and electron theory.
- 211A. Spectroscopy and Atomic Structure. (3) II. Mr. Jenkins
Prerequisite: courses 108B, 121.
A summary of the applications of optical and X-ray spectra to the investigation of the structure of atoms, diatomic molecules, and nuclei.
212. Thermodynamics. (3) I and II. Mr. Chamberlain, Mr. Richman
I: Mr. Chamberlain; II: Mr. Richman.
The principles of thermodynamics, based upon the first and second laws. The thermodynamic investigation of the equilibrium states of various physical systems. Applications to radiation. A brief discussion of the so-called third law.
219. Kinetic Theory. (3) I and II. Mr. Chew, Mr. Lenzen
I: Mr. Chew; II: Mr. Lenzen.
Classical kinetic theory and its explanation of the properties of matter. Introduction to statistical mechanics and the statistical interpretation of thermodynamics. Modification of the classical treatment by quantum theory. Bose-Einstein and Fermi-Dirac statistics.

- 221A-221B. Theoretical Atomic Physics. (3-3) Yr. Mr. Wick
Physical principles of quantum theory, correspondence, complementarity; atomic states and transitions; elementary atomic and nuclear collision problems.
222. Mathematical Methods of Theoretical Physics. (3) I. Mr. Serber
The setting up and solution of differential and integro-differential equations; statistical and algebraic methods for the treatment of problems of physics.
- 223A-223B. Advanced Theoretical Physics. (3-3) Yr. Mr. Lewis
Systematic development of methods of quantum mechanics, electromagnetics, and statistical mechanics; methods of group theory in atomic problems; field theories.
224. Nuclear Physics. (3) I and II. Mr. McMillan, Mr. Segrè
I: Mr. Segrè; II: Mr. McMillan.
Prerequisite: a knowledge of the elements of quantum mechanics.
The structure of the nucleus. Spontaneous nuclear transformations and radiations accompanying them. Induced nuclear reaction. Neutron physics.
225. The Use of Radioactive Isotopes in Experimental Medicine. (1) I and II. Mr. J. H. Lawrence
Consideration of safe tracer doses, biologic and genetic effects, principles of internal radiation therapy, review of literature.
230. Electrodynamics. (3) II. Mr. Serber
Prerequisite: course 210A-210B.
Electrodynamics, radiation, and relativity.
- 231A-231B. Advanced Atomic and Nuclear Physics. (3-3) Yr. Mr. Helmholtz
Prerequisite: courses 121, 124, and a working knowledge of differential equations. Recommended: Chemistry 123.
Problems of atomic and nuclear physics, including an introduction to quantum mechanics; modern theories and recent experimental advances. Primarily for other than Ph.D. candidates in physics.
290. Seminar. (1-3) I and II. The Staff (Mr. Birge in charge)
Advanced study in various fields of modern physics. Topics will vary from year to year. The program for 1949-1950 will probably include seminars in (a) Theoretical Physics (I and II, Lewis, Wick); (b) Cosmic Rays (I and II, Brode); (c) Discharge Through Gases (I and II, Loeb); (d) Spectroscopy (I, Jenkins); (e) Nuclear Physics (I, Segrè); (f) Techniques of Modern Experimental Physics (I and II, Fretter); (g) Biological Effects of Radiation (I, Mr. Dobson).
295. Research. (1-6) I and II. The Staff (Mr. Birge in charge)

COURSES IN OTHER DEPARTMENTS

- The Theory of Waves in an Elastic Medium. (See Geology 204.)
Advanced Seismometry. (See Geology 217.)
Physiological Effects of Radiation. (See Physiology 100D.)
Physical Biochemistry. (See Biochemistry 206.)

PHYSIOLOGY

A Division of the Medical School

- I. LYON CHAIKOFF, M.D., Ph.D., Professor of Physiology.
SHELBURNE F. COOK, Ph.D., Professor of Physiology and Lecturer in Optometry.
JAMES M. D. OLMSTED, Ph.D., Sc.D., Professor of Physiology (Chairman of the Division).

LESLIE L. BENNETT, M.D., Ph.D., Associate Professor of Physiology.

HARDIN B. JONES, Ph.D., Associate Professor of Physiology and Medical Physics.

D. HAROLD COPP, M.D., Ph.D., Assistant Professor of Physiology.

NELLO PACE, Ph.D., Assistant Professor of Physiology.



GORDON L. WALLS, Sc.D., Lecturer in Physiology and Associate Professor of Physiological Optics and Optometry.

Letters and Science List.—All undergraduate courses in physiology are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser.—Mr. Olmsted.

Preparation for the Major.—Required: course 1-1L (5) or Zoölogy 1A-1B (8); Physics 2A-2B (6); Chemistry 1A-1B (10), 8 (3). Recommended: Anatomy 102; Chemistry 5 and 109; a knowledge of calculus; and a reading knowledge of French and German.

The Major.—The major must include courses 100A (3), 110A-110B (6), 112 (3); of the remaining 12 units necessary to complete the required 24, at least 6 must be selected from other upper division courses in physiology; 6 may be selected from upper division courses in related departments, subject to the approval of the chairman.

Students will be required to have a 1.5 grade-point average in courses taken to satisfy the major requirements in physiology.

For fees charged in the Medical School see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

LOWER DIVISION COURSES

1. Introductory Physiology. Lectures. (3) I. Mr. Cook
(Formerly numbered 1A.)
Prerequisite: either high school chemistry or at least 4 units of college physics or biology. Not open to entering freshmen.
Enrollment limited to the capacity of the room provided. Preference will be given to those students for whom the course is required.
- 1L. Introductory Physiology. Laboratory. (2) I. Mr. Cook
(Formerly numbered 1C.)
Prerequisite: course 1 (may be taken concurrently).
Each laboratory section will be limited to ninety students. Preference will be given to those for whose major the course is required.

UPPER DIVISION COURSES

- 100A-100B. General Physiology. (3-3) Yr. Mr. Pace
Prerequisite: Chemistry 1A-1B, 8; Physics 2A-2B; course 1-1L, or Zoölogy 1A-1B, or Botany 1. Recommended: Mathematics 11A-11B.
Lectures on the chemical, mathematical, and physical characteristics of the life process with particular reference to the cell.
- 100D. General Physiology. (3) II. Mr. Jones
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1-1L, or Zoölogy 1A-1B.
Lectures on the physiological effects of radiation.
- 101M. Human Physiology. (8) II. Mr. Olmsted, Mr. Chaikoff, Mr. Bennett
Mr. Copp, and Assistants
Lectures, laboratory, and conferences or demonstrations.
Prescribed for, and limited to, students in the first year of the Medical School. (See ANNOUNCEMENT OF THE MEDICAL SCHOOL for statement concerning fees.)

102. Physiology of Growth and Development in the Child. (2) I. Mr. Copp
Prerequisite: course 1, or Zoölogy 1A-1B, or the equivalent.
Lectures on the physiological changes taking place during development of the child, including those occurring *in utero*, at birth, during growth, and at puberty. The influence of heredity, congenital defects, nutrition, and other factors on growth and development will also be discussed.
- 104A. Physiology of the Endocrines. (2) I. Mr. Chaikoff
Prerequisite: course 1-1L or Zoölogy 1A-1B, or consent of the instructor. Not open to students who have taken 110B.
106. History of Human Physiology. (2) I. Mr. Olmsted
Lectures and reports.
Prerequisite: upper division standing and a laboratory course in one of the following: physiology, biochemistry, anatomy, zoölogy.
107. Environmental Physiology. (3) II. Mr. Pace, Mr. Cook
Prerequisite: course 1, or Zoölogy 1A-1B, or consent of the instructor.
Lectures on the physical, chemical, and biotic influences of the environment on man, and the adaptive changes in response to environment.
- 110A-110B. Mammalian Physiology. (3-3) Yr.
Mr. Olmsted, Mr. Chaikoff, Mr. Bennett, Mr. Copp
Prerequisite: course 1-1L or Zoölogy 1A-1B, Physics 2A-2B, Chemistry 1A, 8. At the discretion of the instructor Biochemistry 103 or Zoölogy 1A may be substituted for course 1-1L.
A comprehensive survey of mammalian physiology.
112. Mammalian Physiology. Laboratory. (3) II.
Mr. Olmsted, Mr. Chaikoff, Mr. Bennett,
Mr. Copp, and Assistants
Prerequisite: course 110A-110B (may be taken concurrently).
Course 112 covers the laboratory work of course 101M and is limited to fifty students.
115. Morphology and Physiology of the Visual System. (3) I.
Lectures and laboratory. Mr. Cook, Mr. Walls
Prerequisite: course 1-1L or Zoölogy 1A.
Open to students in the School of Optometry and to others by permission of the instructor.
- 120A. Comparative Physiology. (3) II. Mr. Cook
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1-1L or Zoölogy 1A-1B.
A survey of the muscular, nervous, and sensory systems of animals in general from the comparative point of view.
- *120B. Comparative Physiology. (3) I. Mr. Cook
Prerequisite: the same as for 120A.
Circulation, respiration, and blood.
- 120C. Comparative Physiology. (3) I. Mr. Cook
Prerequisite: the same as for 120A.
Digestion, metabolism, the endocrines, and excretion.
199. Special Study for Advanced Undergraduates. (2-4) I and II.
The Staff (Mr. Olmsted in charge)
Prerequisite: at least 6 units of upper division courses in physiology.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

201A-201B. Research. (2-8; 2-8) Yr. The Staff (Mr. Olmsted in charge)

* Not to be given, 1949-1950.

203A-203B. Seminar in Physiology. (1-1) Yr.
(Formerly numbered 203.)

Mr. Olmsted

Designed to give students an acquaintance with recent physiological literature, and practice in making reports.

204. Seminar in the Endocrines. (1-3) I.

Mr. Chaikoff

POLITICAL SCIENCE

CHARLES AIKIN, LL.B., Ph.D., Professor of Political Science.

¹ RAYMOND G. GETTELL, M.A., Litt.D., Professor of Political Science.

* JOSEPH P. HARRIS, Ph.D., Professor of Political Science.

DOUGLAS M. KELLEY, M.D., Professor of Criminology.

HANS KELSEN, Ph.D., Professor of Political Science.

AUSTIN F. MACDONALD, Ph.D., Professor of Political Science.

SAMUEL C. MAY, M.A., LL.B., Professor of Political Science and Director of the Bureau of Public Administration.

PETER H. ODEGARD, Ph.D., Professor of Political Science (Chairman of the Department).

FRANK M. RUSSELL, Ph.D., Professor of Political Science.

ORLANDO W. WILSON, A.B., Professor of Political Science.

DAVID P. BARROWS, Ph.D., LL.D., Litt.D., Professor of Political Science, Emeritus.

P. ORMAN RAY, Ph.D., LL.D., Professor of Political Science, Emeritus.

* ERIC C. BELLQUIST, Ph.D., Associate Professor of Political Science.

LLOYD H. FISHER, Ph.D., Associate Professor of Political Science.

N. WING MAH, Ph.D., Associate Professor of Political Science.

M. EDWIN O'NEILL, M.A., Associate Professor of Criminalistics.

DWIGHT WALDO, Ph.D., Associate Professor of Political Science.

GEORGE A. LIPSKY, Ph.D., Assistant Professor of Political Science.

ROBERT A. SCALAPINO, Ph.D., Assistant Professor of Political Science.

* HAROLD WINKLER, Ph.D., Assistant Professor of Political Science.



JESSE L. CARR, B.S., M.D., Lecturer in Criminology.

JAMES W. FESLER, LL.D., Visiting Professor of Political Science.

GEORGE C. GUINS, LL.M., Lecturer in Political Science and Russian.

CHARLES H. HINE, M.A., M.D., Ph.D., Lecturer in Criminology and Assistant Professor of Industrial Toxicology and Public Health.

JOHN D. HOLSTROM, A.B., Lecturer in Criminology.

BOYNTON KAISER, A.B., Lecturer in Political Science.

LANE W. LANCASTER, Ph.D., Visiting Professor of Political Science.

LESLIE LIPSON, Ph.D., Visiting Associate Professor of Political Science.

† THEODORE D. MCCOWN, Ph.D., Lecturer in Criminology and Associate Professor of Anthropology.

LAURENCE SEARS, Ph.D., Visiting Professor of Political Science.

L. DEMING TILTON, B.S., Lecturer in Political Science.

HUBERTUS J. VAN MOOK, LL.D., Visiting Professor of Political Science.

Letters and Science List.—All undergraduate courses in political science except courses 163, 164, 165A-165B, 166, 167A-167B, 167C, 168A-168B, 169, 170, 171, 179, and 183 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

* Absent on leave, 1949-1950.

† Sabbatical leave in residence, 1949-1950.

¹ In residence fall semester only, 1949-1950.

Departmental Major Advisers: Mr. Lipsky, Mr. Macdonald, Mr. Mah, Mr. May.

Preparation for the Major.—Students are not accepted in the major in political science unless they have at least a C average in the prerequisite courses. Required: courses 1, 2 (or 1A–1B as formerly given), and one of the following: Anthropology 1, Economics 1A–1B, Geography 1, 2, History 4A–4B, 8A–8B, 17A–17B, Philosophy 6A–6B, Sociology and Social Institutions 1, 2, 10A–10B.

Fields of Study.—Instruction in the department falls into the following main fields: political theory and public law; international relations; government and politics; public administration. Emphasis in one field is required of each major.

The Major.—Candidates' programs must be submitted to a departmental adviser for approval. The department will certify to the completion of a major program for graduation upon fulfillment of the following requirements:

1. Completion of at least 24 units of upper division courses in the major, of which 18 must be in political science. The 6 upper division units which may be taken in other departments must normally represent courses related to the candidate's field of emphasis and must be approved by his departmental adviser.

2. Inclusion of at least one course in each of the following four groups:

I. 100, 111, 112A, 112B, 113, 114, 115, 116, 117, 118A, 118B, 119, 122, 156, 157A, 157B, 158.

II. 120, 121, 123, 124, 127, 128, 129, 132, 133A, 133B, 134, 135, 136, 138, 139, 142, 175.

III. 130, 131, 140, 141A, 141B, 143, 144, 145, 146, 147A, 147B, 148, 149, 150, 151, 152, 154, 159, 160, 182.

IV. 155, 162, 163, 164, 165, 165A, 165B, 166, 167A, 167B, 167C, 168A, 168B, 169, 170, 171, 172, 174, 176, 179, 180, 181, 183, 184, 185.

3. The candidate must have at graduation at least a C average in all upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in political science.

Special Study Course.—In the senior year students who have shown high attainment may pursue a systematic scheme of reading under the direction of some member of the department. The maximum credit for this course (199) will usually not exceed 4 units in any semester.

LOWER DIVISION COURSES

1. Introduction to Government. (3) I and II.

Mr. Odegard

Two lectures and two section meetings weekly.

An introduction to the principles and problems of government, with particular emphasis on national government in the United States. This course is accepted in partial satisfaction of the American History and Institutions Requirement.

2. Introduction to Government. (Comparative Government) (3) I and II.

Two lectures and one section meeting weekly. Mr. Lipsky

A comparative study of constitutional principles, governmental institutions, and political problems of selected governments abroad.

UPPER DIVISION COURSES

Nonmajors who plan to take upper division courses in political science are strongly advised to take courses 1 and 2. Lacking these, or course 1A–1B, students with satisfactory equivalents may be admitted to upper division courses upon permission of the instructor.

Unless otherwise stated, the first half of any course (A) is not prerequisite to the second half (B).

Group I—Political Theory and Public Law

100. *Origins of Legal Institutions.* (2) II. Mr. Kelsen
The development and agencies of legal growth since primitive times and the interrelations between law and government. The early legal institutions of Europe and their influence on the modern juridical systems.
111. *Theory of the State.* (3) I. Mr. Gettell
The nature of the state, its organization and activities, and its relation to individuals and to other states.
- 112A-112B. *Principles of Politics.* (3-3) Yr. Mr. Lancaster
112A. The philosophical and religious matrix of political problems from the Periclean Age through the Reformation.
112B. An analysis of the philosophical implications of different forms of political authority. The influence of science and industry on modes of political thought from the Renaissance through the rise of the totalitarian state.
113. *American Political Theory.* (3) II. Mr. Sears
Underlying theories and principles of American governmental policy.
114. *Public Opinion.* (3) I. Mr. Odegard
An analysis of the nature of public opinion and the methods of influencing it. The press, radio, and other instruments of communication; political parties and pressure groups; government and the formation of public opinion, informational agencies and activities. Emphasis will be given to problems of government and public opinion in war and peace.
115. *Recent American Political Thought.* (3) I. Mr. Sears
A critical appraisal of recent thinking about American politics. Analysis of economic, religious, literary, and scientific influences in the search for a philosophy for democracy.
116. *Soviet Economic Law.* (2) I. Mr. Guins
(Formerly numbered 116A-116B.)
A comparative study of the prerevolutionary and the Soviet economic structure and legislature: general principles of economic law, private law, land, and labor law.
117. *Elements of Jurisprudence.* (3) I. Mr. Kelsen
Fundamental legal principles, especially from the analytical, historical, philosophical, and sociological points of view. Particular attention will be given to modern theories of the function of law.
- 118A-*118B. *History of Political Theory.* (2-2) Yr. Mr. Gettell
- *119. *The Development of American Federalism.* (3) II. _____
122. *The Development of Political Thought in the Far East.* (3) II. Mr. Scalapino
Analysis of the political thought of China and Japan, comparison with the heritage of Western political philosophy; examination of modern Oriental political philosophy, the syncretic product of contact with Westernism.
156. *Administrative Law.* (3) II. Mr. Aikin
A study of the position of the executive branch of government in the American constitutional system, of the foundation of administrative power, of the area of judicial supervision of administration, and of the liability of public officers and of the state based on misuse of administrative power.
- 157A-157B. *Constitutional Law of the United States.* (3-3) Yr. Mr. Aikin
An examination of the structure of public power in American national, state, and local government.
157A. The federal system: expansion of national authority; interstate

* Not to be given, 1949-1950.

barriers; separation of powers; admission of states to the Union; inter-state compacts; constitutional amendments; treaties.

157B. Rights of individuals; citizenship; suffrage; education; civil liberty; rights of accused; rights in war; slavery.

158. Government and Business. (3) I. Mr. Aikin
A study of the basis of national and state control of industry and agriculture, and the extent to which government may control competition, maintain prices, protect home industries, prevent waste, establish quality standards, regulate conditions of labor, etc.
- Group II—International Relations**
120. Colonies in World Politics. (3) I. Mr. van Mook
121. The American Role in the Far East. (3) I. Mr. Scalapino
A survey of the role which the United States has played in the Far East through the examination of such topics as America's role in Asiatic Westernization, United States—Far Eastern foreign policy, Oriental attitudes toward America. Evaluation of present-day problems.
123. International Politics. (3) I. Mr. Russell
Rise and development of the Western State system; problems of nationalism and imperialism, particularly in connection with the peace settlement following the Second World War.
124. International Organizations. (3) II. Mr. Russell
International unions and commissions of the nineteenth century. First World War and establishment of the League of Nations; Second World War and formation of the United Nations and other agencies of international coöperation.
127. Theories of International Relations. (3) II. Mr. Waldo
Historical development and present range of political thought on relations between nations; origins and implications of the idea of sovereignty; the theory of an international community; theories of imperialism; Christian, Social, and Fascist ideas; geopolitical theories.
128. Recent American Foreign Policy. (3) I. Mr. Russell
Abandonment of isolation and assumption of leadership during the First World War. Return to isolationist policies in the Twenties. The neutrality acts of the Thirties. The Second World War and reversal of the policy of isolation.
132. The Revolutionary Process in the Far East. (3) II. Mr. Scalapino
Definition of revolution; examination of certain classical western revolutions; the nature, technics, and significance of nineteenth- and twentieth-century revolution in the areas of Japan, China, Korea, and Southeast Asia.
- 133A—133B. Principles of International Law. (3—3) Yr. Mr. Kelsen
The nature and sources of international law, its historical development, and its scope and function as a part of the contemporary legal system.
134. Economic Problems of Undeveloped Areas. (3) I. Mr. van Mook
135. Political Development of China. (3) I. Mr. Mah
China as a nation in the Oriental world; impact of the Occident upon China and its repercussions; the internal and external aspects of the struggle for the creation of a modern democratic state; China in international politics.
136. Problems of the Pacific Area. (3) II. Mr. Mah
A discussion of the more important political issues and problems posed by the powers in their relations with each other in the Pacific.

138. International Relations of the Far East. (3) I. Mr. Mah
A general survey.
139. The Problem of Colonialism in the Far East. (3) II. Mr. Mah
A survey of colonial rule in the Far East, its changing status and resultant problems.
142. The Foreign Policy of the Soviet Union. (3) II. Mr. Lipsky
The constant factors in Russian foreign policy. Policy of the early years as affected by Marxian ideology, internal conditions, and foreign interference. Period of truce and limited coöperation with the Western Powers. Effect of the breakdown of the League. The Second World War and aftermath.
- *175. The Conduct of American Foreign Relations. (3) II. Mr. Bellquist
Diplomacy and the conduct and control of foreign relations. The Department of State and the Foreign Service. Case studies in recent diplomacy to illustrate policy formation and execution. Some comparative materials will be introduced but emphasis will be placed upon the United States.

Group III—Government and Politics

- *130. Government and Politics of the Balkan States. (3) II. ———
131. The Political Society of Japan. (3) I. Mr. Scalapino
Basic political problems of modern Japan approached through the development of the background of social, economic, and political patterns which have characterized Japanese society. Primary emphasis upon the nature of the evolution through which Japanese society has passed since the middle nineteenth century.
140. Politics of Labor. (3) II. Mr. Fisher
The political dynamics of American organized labor. Effect of the internal structure of labor on its external policies. Interaction between labor and other pressure groups, political parties, the government. The international organization of labor.
- 141A. Government of the Soviet Union. (3) I. Mr. Lipsky
The peoples and resources of the Union; the Bolshevik Revolution of November, 1917; the experiment with Communism. The Communist ideology and its relation to the Soviet political and social structure. Evolution of Soviet internal policy.
- 141B. Government of the Soviet Union. (2) II. Mr. Guins
Soviet legal theory and public law: a comparative study of Soviet legal theory, including the Soviet theory of international law and of public law, and the judicial system in the Soviet Union and its allied states.
143. Government of the British Dominions. (3) II. Mr. Lipson
The evolution of the British Commonwealth and changing status of its members; the internal politics of Australia, Canada, South Africa, and New Zealand: their similarities and differences.
144. Government of Great Britain. (3) I. Mr. Lipson
A study of the democratic process in Britain, as it operates through party politics and the machinery of government; the nature of the cabinet system; the functions undertaken by the state; and the gradualist blending of tradition and change.
- *145. Government and Policies of Japan. (3) II. Mr. Mah
How Japan is governed, with consideration of major changes in her basic political structure and policies under Allied military occupation.

* Not to be given, 1949-1950.

*146. Government and Policies of the Northern Countries. (3) I.

Mr. Bellquist

Constitutionalism and parliamentarism in the countries of Northern Europe—Denmark, Finland, Iceland, Norway, and Sweden. Development of their political institutions; wartime government in Northern Europe; their present governmental systems. Social legislation in Scandinavia; foreign policies; inter-Scandinavian cooperation.

147A. Comparative Government: Government and Politics of France. (2) I.

Mr. Lipson

An introduction to problems of comparative government and the analysis of the modern democratic state. The constitutions and institutions of modern France will be taken as a case-study in the application of democratic principles and the resistance to them.

147B. Comparative Government: Government and Politics of Germany and Switzerland. (2) II.

Mr. Lipson

A comparative treatment of the political record of two western European communities; the problem of attaining national unity through uniformity or diversity, through a federal or unitary state; the nature of party groupings; the causes of the phenomenon of Nazism.

148. Governments of Latin America. (3) I.

Mr. Macdonald

(Formerly numbered 148A.)

Latin-American parties and politics; governmental activities and problems; the structure of government. Emphasis is placed on political realities rather than formal constitutional provisions.

149. Latin America in World Affairs. (3) II.

Mr. Macdonald

(Formerly numbered 148B.)

Relations of Latin America with the United States and other world powers. Pan-Americanism and its relation to world organization. The future of Latin America in the community of nations.

*150. Survey of American Governments. (3) I and II.

Mr. Lipsky

Open to sophomores, juniors, and seniors without prerequisites. Not open to political science majors nor to students who have taken course 1 or 151. Accepted in partial satisfaction of the American History and Institutions Requirement.

*151. American National Government. (3) I.

A survey of the powers, structure, and operation of the Government of the United States and the principles which underlie American democracy. Not open to students who have taken course 150.

152. Political Parties. (3) II.

Mr. Lancaster

Nature and functions of political parties; their origin, development, structure, economic and social composition, internal management and control; relation of parties and pressure groups to legislation and administration; analysis of pressure politics as distinguished from party politics.

*154. American Legislative Bodies. (3) II.

Mr. Harris

A study of the organization and operation of Congress and state legislatures; sources of legislation; legislative aids; public policy and pressure groups; legislative leadership; executive-legislative relations; legislative processes; and the reorganization of Congress and state legislatures.

*159. Basic Factors in American Politics. (3) I.

Mr. Waldo

The constitutional-legal background of American political action; historical, social, and ideological factors affecting American politics; the politics of economic interests and geographical areas; emergent political patterns in the two-party system.

- *160. Public Relations. (2) II. Mr. Odegard
Open only to seniors and graduate students.
An exploration of the meaning and significance of public relations in American society and a study of the basic principles and methods involved. Specific public relations problems in government, industry, and education will be examined and the methods used to meet them described and analyzed.
182. Federal, State, and Local Relations. (3) I. Mr. Fesler
The legal, financial, and administrative relationships and cooperative arrangements between the several levels of government; centralization, states' rights, uniform state laws, interstate cooperation; home rule and state supervision over cities and other local units of government.

Group IV—Public Administration

155. National Administration in the United States. (3) II. Mr. May
History, organization, personnel, business methods, and accomplishments of the departments of the administrative branch of the United States Government, with special reference to the developments since 1933.
162. Municipal Government and Administration. (3) I. Mr. Macdonald
How cities are organized and what they are doing; municipal politics; relations of city and state; problems and activities of modern cities; traffic regulation, city and regional planning, zoning, police and fire protection, budget making; the war against crime.
164. Physical Evidence. (2) I. Mr. O'Neill
Enrollment limited to criminology majors.
Search at crime scenes for physical evidence and photographing, recording, preserving, and transporting it to the laboratory. Cast preparation and tests conducted at crime scenes.
- 165A-165B. Psychiatric Aspects of Criminology. (3-3) Yr. Mr. Kelley
(Formerly numbered 165.)
Prerequisite: Psychology 160 or 168.
The structure of the normal and abnormal personality in relation to criminology is presented, including methods of evaluating intelligence, maturity, pathological manifestations, together with indications of prevention, diagnosis, and treatment from a medical-legal point of view.
166. Legal Medicine and Toxicology. (3) I. Mr. Carr, Mr. Hine
Prerequisite: Physiology 1 or equivalent.
Analysis of death, its time and cause; of wounds, fractures, body fluids and tissues, blood traces, and other evidence to establish the circumstances of injury. Survey of the different classes of poisons; their recognition, untoward physiologic effects, and criminal uses.
- 167A-167B. Police Administration. (3-3) Yr. Mr. Wilson
Course 167A is prerequisite to 167B.
Introduction to the principles of police organization and administration, discussion of police statistics, criminal identification and investigation; educational methods for combating crime and vice, and controlling traffic.
- 167C. Police Planning. (2) II. Mr. Wilson
Prerequisite: course 167A-167B.
Considerations in discovering and analyzing needs, formulating policies, developing plans and procedures, and evaluating their effectiveness. Analysis of distribution of personnel, measures of performance and service, selection, training and discipline, M. O., operating programs, procedural manuals and tactics.

* Not to be given, 1949-1950.

- 168A. Crime Investigation. (2) I. Mr. Wilson
Principles involved in the investigation of crimes; interrogation of victims, witnesses, and suspects; police organization and procedures for the investigation of crimes.
- 168B. Personal Identification. (3) II. Mr. O'Neill
A study of methods used in the identification of persons, living and dead; fingerprint identification; Bertillonage; sight recognition; portrait parle; anatomical bases, including skeletal remains to ascertain sex, race, age, size, and identity.
169. Legal Relations Involved in Criminology. (3) II. _____
Prerequisite: at least junior standing and course 167A-167B.
History of criminal law, relation to civil law, Penal Code, arrest, searches and seizures, evidence, special classes of persons.
170. Questioned Documents. (3) I. Mr. O'Neill
Lecture, demonstrations, and laboratory.
Problems of handwriting, handprinting, and typewriting in the examination of questioned documents, including studies of erasures, alterations, and obliterations; methods of restoring and deciphering effaced writing; document photography; investigation of anonymous letters.
171. Comparative Microscopy. (3) II. Mr. O'Neill
Lecture, demonstrations, and laboratory.
Comparative studies of gross and microscopic characteristics of crime exhibits including glass, metal, wood, cloth, paper, string, and rope; examinations of tools and tool marks; principles of comparison of bullets and cartridge cases; reproduction by impressions, casts, and photographs.
172. State Government and Administration. (3) II. Mr. Macdonald
Organization of state government; federal-state relations; elections and politics; the courts; county government; current administrative problems such as state finance, the merit system, regulation of business, the state and labor, conservation of natural resources, health, welfare, correction.
- *174. Public Expenditure and Financial Administration. (3) II. _____
176. Recent National Policy. (3) II. Mr. Fesler
An analytical survey of the Federal government's relations to business, agriculture, labor, and the economy as a whole. Transportation, communication, and energy resources policies; and welfare programs. The government's foreign policies and national defense programs are excluded.
179. Detection of Deception. (3) I. Mr. Kelley
The practice of deception is studied from an historical, psychological, physiological, and psychiatric point of view, including demonstrations and techniques designed to uncover attempts at deception in unlawful situations.
180. American Administrative Theory. (3) I. Mr. Waldo
A study of the theory of the American public administration movement; leading men, movements, and motifs in the development of administrative doctrine; review and criticism of administrative theory on such subjects as separation of powers and interrelation of functions; relationships of administrative theory and political theory.
181. Principles of Public Administration. (3) I. Mr. May
Development of public administration and its relation to other branches of government; powers and liabilities of administrative officials; organization for different governmental functions, including line, staff, and auxiliary services, with special reference to budget and personnel administration and administrative planning.

* Not to be given. 1949-1950.

183. Public Personnel Administration. (3) I. Mr. Fesler
 A survey of public personnel administration, including the history of civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee organizations, and retirement.
184. Advanced Principles of Public Administration. (3) II. Mr. Fesler
 Advanced study of organization, financial administration, planning, overhead management, and the relationships of administration to the legislature, public opinion, and pressure groups.
185. Government Planning. (3) I. Mr. May
 An analysis of governmental agencies which conduct research and disseminate information concerning our physical, economic, and human resources, and stimulate, regulate, or control their use through orderly programs of national, regional, and local development directed toward optimum utilization and social stability in peace and mobilization for defense.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Only graduate students may enroll in seminars.

Unless otherwise stated, the first half (A) of any seminar is not prerequisite to the second half (B).

- *200. Bibliography and Research Methods in Political Science. ———
210. Seminar in Modern Political Thought. (2) I. Mr. Lancaster
 An intensive examination of the basic political attitudes of the modern mind. Research topics center about the impact of technology on politics.
- 212A-212B. Seminar in Contemporary Political Theory. (2-2) Yr.
 Mr. Gettell, Mr. Lancaster
214. The Scope and Method of Political Science. (2) I. Mr. Fisher
 Politics as the unifying focus of the social sciences for planning purposes. The philosophical, economic, historical, juristic, psychological, and statistical approaches to problems of private government in labor and business.
- *224. Seminar in Public Opinion. (2) II. Mr. Bellquist
- 228A-228B. Seminar in Russian and Soviet Law. (2-2) Yr. Mr. Guins
 Conferences on Russian and Soviet legal theory and public law: self-government and federalism, constitutional problems and individual rights. Study of Soviet legal theory and international private law.
229. Basic Factors in the Foreign Policies of National States. (2) II.
 Mr. Russell
 Open to graduate students with requisite background as determined in consultation with the instructor.
- 231A-231B. Seminar in International Organization. (2-2) Yr. Mr. Russell
- 232A-232B. Seminar in International Relations. (2-2) Yr. Mr. Lipsky
 The definition of the field of study. The bases of international relations in conflicting ideologies and philosophies. Special problems: imperialism, population, economic relations, area and regional problems, military factors, geographical factors.
- 233A-233B. Seminar in International Law. (2-2) Yr. Mr. Kelsen
 Technique of international law and legal problems of international organization; critical analysis of the Charter of the United Nations; discussion of some actual projects for world organization from a legal point of view.

* Not to be given. 1949-1950.

- *234. Seminar on Selected Problems in Balkan Governments and Politics.
(2) II.
- 238A-238B. Seminar in International Relations: The Far East and the Pacific Area. (2-2) Yr. Mr. Mah
Open to students who have already had basic training in international politics of the Far East.
239. Seminar in Southeastern Asia. (2) I. Mr. van Mook
- 245A-245B. Seminar in Contemporary Political Problems of Japan.
(2-2) Yr. Mr. Scalapino
Restricted to students who have a reading knowledge of Japanese.
- 248A-248B. Seminar in Comparative Government. (2-2) Yr. Mr. Lipson
Studies in European political and constitutional developments.
- 250A-250B. Seminar in Governments and International Relations of Latin America. (2-2) Yr. Mr. Macdonald
Problems of government, politics, and administration in Latin America; inter-American relations.
253. Seminar in Comparative National Administration. (2) II. Mr. Waldo
Comparative studies of national administration in relation to constitutional structures, economic systems, historical traditions, and cultural patterns.
254. Seminar in Administration and Technology. (2) I. Mr. Waldo
- 255A-255B. Seminar in Federal Administration. (2-2) Yr. Mr. May
Special studies in problems of federal administration.
- 257A-257B. Seminar in Constitutional and Administrative Law. (2-2) Yr.
Mr. Aikin
Fundamental principles of constitutional law; leading cases; judicial decisions affecting the liabilities, rights, duties, and procedure of governmental officers and agencies.
- 259A-259B. Seminar in American Politics. (2-2) Yr.
Mr. Lancaster, Mr. Odegard
261. Seminar in Municipal Administration. (2) II. Mr. May
- 264A-264B. Seminar in Planning. (2-2) Yr. Mr. Tilton
Principles and methods of governmental planning, with particular reference to the work of federal, state, and local planning agencies in California.
- 267A-267B. Seminar in Police Administration. (2-2) Yr. Mr. Wilson
- *272. Seminar in State Administration. (2) II. Mr. May
273. Seminar in Public Personnel Administration. (2) II. Mr. Kaiser
(Formerly numbered 273A-273B.)
Techniques and problems in the field of public personnel administration with special reference to federal, state, and local agencies.
- *274A-274B. Public Expenditure and Financial Administration. (2-2) Yr.
Mr. Harris
- 275A-275B. Research in the Administration of Criminal Justice. (2-2) Yr.
Mr. Holstrom
- 281A-281B. Seminar in Public Administration. (2-2) Yr. Mr. Fesler
The first semester is devoted to an advanced study of the major problems and processes of administration; the second semester is devoted to research assignments on selected topics.

COURSES COMMON TO ALL GROUPS

199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Aikin in charge)
298. Individual Study. (1-4) I and II. The Staff (Mr. Waldo in charge)

BUREAU OF PUBLIC ADMINISTRATION

The Bureau of Public Administration, in conjunction with the Library of Economic Research, maintains an extensive collection of current pamphlets, periodicals, and documents relating to the work of government, in Rooms 112-120, Library. Through its director and research staff, it offers to properly qualified graduate students opportunities for study and research in various fields of public administration, and cooperates with governmental agencies in placement. It is prepared to cooperate with upper division students in arranging combinations of existing courses leading toward particular types of governmental service.

Further information may be obtained by consulting the Director, Mr. Samuel C. May, Room 113, Library.

BUREAU OF INTERNATIONAL RELATIONS

The Bureau of International Relations, in Rooms 207-208, South Hall, was established by the University in 1921. It provides facilities for upper division and graduate students and interested members of the faculty to enable them to pursue study and research in the field of international law and relations. Among other primary sources, it contains a complete set of official documents of the League of Nations, including its Treaty Series, the Publications of the Permanent Court of International Justice, and the documentation of the United Nations. In addition to the documentary collection, the Bureau has many important secondary works dealing with current international problems, a number of outstanding American and foreign periodicals, and certain American and English newspapers regarded as most useful in the field.

Further information may be obtained from Mr. F. M. Russell, 207 South Hall.

PSYCHOLOGY

- ¹ OLGA L. BRIDGMAN, M.D., Ph.D., Sc.D., Professor of Psychology and Pediatrics.
- CLARENCE W. BROWN, Ph.D., Professor of Psychology (Chairman of the Department).
- WARNER BROWN, Ph.D., Professor of Psychology.
- EGON BRUNSWIK, Ph.D., Professor of Psychology.
- ERIK H. ERIKSON, Professor of Psychology.
- EDWIN E. GHISELLI, Ph.D., Professor of Psychology.
- HAROLD E. JONES, Ph.D., Professor of Psychology.
- JEAN WALKER MACFARLANE, Ph.D., Professor of Psychology.
- DONALD W. MACKINNON, Ph.D., Professor of Psychology.
- R. NEVITT SANFORD, Ph.D., Professor of Psychology.
- EDWARD C. TOLMAN, Ph.D., Professor of Psychology.
- ¹ ROBERT CHOATE TRYON, Ph.D., Professor of Psychology.
- GEORGE M. STRATTON, Ph.D., Professor of Psychology, Emeritus.
- EGERTON L. BALLACHEY, Ph.D., Associate Professor of Psychology.
- ² HOWARD C. GILHOUSEN, Ph.D., Associate Professor of Psychology.
- ^{*} DAVID KRECH, Ph.D., Associate Professor of Psychology.

* Absent on leave, 1949-1950.

¹ In residence fall semester only, 1949-1950.

² In residence spring semester only, 1949-1950.

AUDREY SCHUMACHER, Ph.D., Associate Clinical Professor of Psychology.
 HUBERT S. COFFEY, Ph.D., Assistant Professor of Psychology.
 MASON HAIRE, Ph.D., Assistant Professor of Psychology.
 RHEEM F. JARRETT, Ph.D., Assistant Professor of Psychology.
 *BENBOW F. RITCHIE, Ph.D., Assistant Professor of Psychology.
 ALEX C. SHERRIFFS, Ph.D., Assistant Professor of Psychology.
 READ D. TUDDENHAM, Ph.D., Assistant Professor of Psychology.
 RALPH R. CANTER, Ph.D., Instructor in Psychology.
 JOHN P. MCKEE, Ph.D., Instructor in Psychology.



*EDWARD N. BARNHART, Ph.D., Lecturer in Psychology and Assistant Professor of Speech.
 NANCY BAYLEY (Nancy Bayley Reid), Ph.D., Lecturer in Psychology.
 RICHARD S. CRUTCHFIELD, Ph.D., Visiting Associate Professor of Psychology.
 ELSE FRENKEL-BRUNSWIK, Ph.D., Lecturer in Psychology.
 HARRISON G. GOUGH, Ph.D., Lecturer in Psychology.
 ROBERT E. HARRIS, Ph.D., Lecturer in Psychology and Associate Professor of Medical Psychology.
 HERBERT H. HYMAN, Ph.D., Lecturer in Psychology.
 LUDWIG IMMERGLUCK, Ph.D., Lecturer in Psychology.
 MARY C. JONES, Ph.D., Lecturer in Psychology.
 CATHERINE LANDRETH, Ph.D., Lecturer in Psychology and Associate Professor of Home Economics.
 THEODORE R. SARBIN, Ph.D., Lecturer in Psychology.

Letters and Science List.—All undergraduate courses in this department except 3, 104, 116, 117, 144, 185, and 186 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers: Mr. Ballachey, Mr. Jarrett, Mr. Sanford, Mr. Tuddenham.

Preparation for the Major.—Required: Psychology 1A, 1B, 5, Physiology 1, 1L, and Zoölogy 10. (Zoölogy 1A–1B may be substituted for Physiology 1, 1L and Zoölogy 10). Second-year high school algebra or Mathematics D is prerequisite to Psychology 5. Psychology 1A, 1B, 5, Physiology 1 and 1L are not open to entering freshmen. The required courses should be completed before the beginning of the junior year and must be completed before the beginning of the senior year. Recommended: English composition, mathematics, philosophy, anthropology, sociology, and economics. Completion of prerequisites for upper division work in several of these fields is highly desirable, since the psychology major requires advanced work in departments other than psychology.

The Major.—The department offers two programs for the major:

Plan I: For liberal arts students who do not plan to continue beyond the A.B. degree.

Plan II: For students of superior scholarship who plan to become candidates for the M.A. or Ph.D. degrees in psychology.

Both plans emphasize breadth of education. Narrow specialization in psychology is discouraged.

Plan I.—Required: 24 upper division units of which not less than 18 nor more than 21 units may be taken in the Department of Psychology, the remaining units to be selected, subject to the approval of the adviser, from the list of related courses in other departments acceptable as part of the major.

* Absent on leave, 1949–1950.

Plan II.—Required: 24 upper division units including the junior course, Psychology 101A–101B; the senior course, Psychology 102A–102B, and not less than 6 nor more than 9 units chosen from other courses in the Department of Psychology. The remaining units to be selected, subject to the approval of the adviser, from the list of related courses in other departments acceptable as part of the major. Admission to the major under Plan II is limited to students who have demonstrated superior scholarship in lower division prerequisites for the major and in their general university work.

Note that four semesters of work are required in the upper division. Unless all preparatory courses have been completed in the lower division, more than four semesters may be required in the upper division.

List of courses in other departments acceptable as part of the major in psychology.

Anatomy 102, 103
 Business Administration 151
 Economics 106, 150, 152, 180
 Education 110, 113, 116, 153, 154, 161, 164
 Genetics 100, 102
 Home Economics 132, 133, 142
 Optometry 105B, 106B
 Political Science 181, 183
 Social Welfare 104, 105, 106, 108
 Speech 117A–117B, 118, 119
 Zoölogy 114, 115.

Any upper division course in:

Anthropology
 Mathematics
 Philosophy
 Physiology
 Sociology and Social Institutions

The department will certify to the completion of the major program for graduation under either Plan I or Plan II, only on the basis of at least a C average in the upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in psychology.

Honor Students.—Honors are granted on the basis of the whole record of the student.

LOWER DIVISION COURSES

- 1A. General Psychology. (3) I and II. Mr. W. Brown
 Three lectures and one section meeting weekly. Not open to entering freshmen.
 The sequence 1A–1B or 1A–33 will be accepted in fulfillment of requirement (e) for the degree of Associate in Arts.
- 1B. General Psychology. (3) I and II. Mr. C. W. Brown
 A continuation of course 1A with a detailed treatment of the application of the scientific method in the study of behavior. Basic assumptions, limitations, and advantages of the method of experiment. Intended primarily for prospective major students.
3. Introduction to Applied Psychology. (3) I. Mr. Ghiselli
 Prerequisite: sophomore standing.
 A survey of psychological problems involved in the selection of employees, industrial production, conditions of work, motivation of employees, advertising, selling, market research, measurement of public opinion, law, and highway safety.

5. Introduction to Psychological Measurements. (3) I and II.

Mr. Jarrett in charge

Three lectures and one section meeting weekly.

Open only to students whose major subject is psychology.

Prerequisite: second-year high school algebra or Mathematics D, and course 1A (may be taken concurrently). Not open to students who are taking, or have taken, another course in statistics.

Arrays of experimental measurements, central tendencies, variability, correlation, significance of measures; elementary reliability and validity of tests.

33. Personal and Social Adjustment. (3) I and II.

Mr. Sherriffs

(Formerly numbered 2.)

Prerequisite: course 1A. A continuation of course 1A intended primarily for students who will not major in psychology.

The dynamics of normal personality development. Family relationships, social adjustment, and factors modifying self-evaluation are emphasized.

UPPER DIVISION COURSES

Course 1A-1B or 1A-33, and junior standing are prerequisite to all upper division courses unless otherwise stated.

101A-101B. Methods of Psychology. (3-3) Yr.

Mr. C. W. Brown, Mr. W. Brown, Mr. Brunswik, Mr. Jarrett

Lectures and laboratory.

Prerequisite: courses 1A, 1B, 5, and consent of the instructor. Restricted to students undertaking the major under Plan II.

Exercises in the application of experimental and statistical methods to problems in the various areas of specialization in psychology. Formulation of problems, research design, control of variables, treatment of data, evaluation and interpretation of results.

102A-102B. Advanced General Psychology. (3-3) Yr.

The Staff (Mr. Crutchfield in charge, fall semester;
Mr. Tolman in charge, spring semester)

Lectures and laboratory.

Prerequisite: course 101A-101B and consent of the instructor. Restricted to students undertaking the major under Plan II.

A consideration of the basic psychological processes of motivation, perception, learning, thinking, and emotion, as exhibited in behavior and consciousness and as modified by differences in capacity and in individual and social experience. Lectures, demonstrations, and class discussions.

104. Principles of Test Construction. (3) II.

Mr. C. W. Brown

Lectures and demonstrations.

Prerequisite: course 5 or an equivalent course in statistics.

Methods of constructing and validating psychological tests and scales, devising adequate criteria, principles of item construction, item reliability and validity, determining optimal scoring and weighting, devising relative and absolute scales.

*106B. Experimental Psychology. (3)

Lectures and four hours of laboratory to be arranged.

Individual laboratory problems.

*108A-108B. Physiological Psychology. (3) I.

Lectures and laboratory. Enrollment limited to twenty students.

Prerequisite: course 5 and Physiology 1 or consent of the instructor.

- *109. Measurement of Traits. (3) Mr. Tryon
Prerequisite: consent of the instructor.
Experimental evidence on interrelations between intelligence, emotion, temperament, and attitudes; objective theories of ability; mental "factors"; theories of Thorndike, Spearman, Thomson, Kelley, and others.
112. Developmental Psychology. (2) I. Mr. Jones, Mr. McKee
Prerequisite: Section 1: courses 1A, 1B, and 5 (this section for psychology majors). Section 2: course 1A (this section for nonpsychology majors).
The development of motor functions, social and emotional traits, language, and mental abilities. Individual differences in development and performance, as related to physical, social, and psychological factors.
113. Adolescence. (2) II. Mr. Jones, Mr. McKee
Prerequisite: Section 1: courses 1A, 1B, and 5 (this section for psychology majors). Section 2: course 1A (this section for nonpsychology majors).
A survey of current research, with particular reference to the analysis and interpretation of data from growth studies.
115. Laboratory in Adolescent Development. (1) II. Mr. Jones
Three hours to be arranged.
Prerequisite: consent of the instructor.
Offered to a limited number of students also enrolled in course 113.
Individual projects and reports.
116. Tests and Measurements of Infants and Preschool Children. (1) I. Miss Bayley
Prerequisite: courses 5 and 112 or Home Economics 132.
Instruction in the most commonly used techniques of measurement of physical, motor, and mental development, with evaluation and interpretation of test scores and measures of infants and young children.
117. Laboratory Tests and Measurements of Infants and Preschool Children. (2) I. Miss Bayley
Prerequisite: consent of the instructor.
Laboratory work at the Institute of Child Welfare, accompanying course 116.
120. Introduction to History and Systems of Psychology. (3) II. Mr. Brunswik
Prerequisite: 12 upper division units in psychology, or graduate standing in philosophy, biology, or sociology.
Major stages in the emergence of psychology as an independent science from its beginnings in ancient philosophy and medicine to the present. Classical nineteenth-century structuralism will be compared with such modern schools as functionalism, behaviorism, Gestalt psychology, and psychoanalysis.
- *126. Contemporary Psychology. (3) I. Mr. W. Brown
Prerequisite: at least 6 upper division units in psychology. Primarily for seniors and graduates.
Reading and discussion of current books and monographs, affording a survey of contemporary aims, methods, and achievements.
- *131. Perception. (3) Mr. Brunswik
Problems of figure-ground organization including geometrical illusions (Gestalt psychology), of the perception of space, of the thing-constancies, and of social perception will be demonstrated and theoretically discussed.

132. Thinking and Learning. (3) II. Mr. Crutchfield
Prerequisite: course 5 and consent of the instructor.
Survey of experimental material, both animal and human, available in the field. Attempt to formulate systematically a theory of learning and thinking.
134. Motivation. (3) II. Mr. Tolman
Prerequisite: at least 6 upper division units in psychology. Primarily for seniors and graduates.
The nature of primary and secondary drives; the theories concerning drives found in animal, child, experimental, social, and abnormal psychology, and in philosophy.
136. Psychology of the Unconscious. (3) II. Mr. MacKinnon
A consideration of the evidence for, and the nature and role of, unconscious psychological processes in behavior.
- *141. Personality in Society and Culture. (3) I. Mr. MacKinnon
A consideration of the social and cultural determinants of personality.
- *143. Propaganda. (3) II. Mr. Krech
Theory of suggestions, imitation, and propaganda; the function of speech in propaganda and communication; analysis of current propaganda techniques and objectives.
145. Social Psychology. (3) I and II. Mr. Ballachey, Mr. Hyman
(Formerly numbered 145A.)
Prerequisite: course 1A.
Sections to be arranged.
Psychological nature of: society, its functions and instruments; social groups, their ways, sanctions, symbols, social controls; social status, prestige and mobility; social interaction, including conflict; social change. The person's adjustment to these phenomena.
146. Differential Psychology. (3) I. Mr. Tryon
The origin and nature of psychological differences between individuals.
- 148A. Personality. (3) II. Mr. Sanford
Prerequisite: course 162 or 134 or 136 and senior or graduate standing.
A survey of recent thought and research in the field of personality, with emphasis on dynamic and genetic problems.
- 148B. Personality. (3) I. Mr. Sanford
A continuation of course 148A.
- 150A. Animal Psychology. (3) II. Mr. Gilhausen
General survey of the behavior of the higher animal forms.
- *150B. Animal Psychology. (3) II. _____
Lectures and laboratory.
A more intensive survey of the experimental literature on learning, motivation, and problem-solving in the higher forms.
151. Experiments in Animal Psychology. (3) II. Mr. Gilhausen
Lecture and laboratory.
Prerequisite: course 150A and consent of the instructor.
160. Mental Deficiency. (3) I. Miss Bridgman
Mental deficiency and abnormality in children, including a consideration of tests used in clinical examinations.
162. Clinical Psychology. (3) I and II. Mrs. Macfarlane
Prerequisite: course 5 or equivalent, and either 112, 113, 160, 168 or Home Economics 132.
Behavior of normal children. Dynamics of personality development.

165. Introduction to Clinical Methods. (3) II. Mr. Tuddenham
Prerequisite: course 5.
A consideration of the methods and procedures of clinical diagnosis. Historical development of psychometric theory. Description and evaluation of the principal tests of ability and personality.
- *168. Abnormal Psychology. (3) II. _____
Prerequisite: 6 units of upper division psychology, or with consent of the instructor, premedical status.
The relations of psychology to the psychoneuroses and psychoses; the appearance of abnormal traits in incipient stages of mental disturbance.
180. Psychological Aspects of Advertising, Selling, and Market Research. (3) I. Mr. Canter
Prerequisite: course 1A or 3.
A consideration of the application of psychological techniques and principles derived from controlled observation to the study of problems in advertising, selling, and market research. Field work.
185. Personnel and Industrial Psychology. (3) I and II. Mr. Ghiselli
Prerequisite: course 1A or 3 or Business Administration 151, or senior standing in the College of Engineering.
A discussion of techniques for the selection and classification of employees, the psychological aspects of the study of work methods, conditions of work, training, employee motivation, and morale.
186. Occupational Counseling and Classification. (3) II. _____
Prerequisite: course 162 or 185 and consent of instructor.
Principles of occupational counseling, nature and sources of occupational information, evaluation and use of standard occupational tests.
187. Human Relations in Industry. (3) I. Mr. Canter
Prerequisite: course 185.
The motivation of workers, psychological aspects of worker-management relationships, factors in employee morale, the maladjusted worker, leadership.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff
By permission, honor students who are adequately prepared may carry on study or research under the guidance of a member of the department.

GRADUATE COURSES AND SEMINARS

Full graduate status in psychology and consent of the instructor are prerequisite to all graduate offerings. Full graduate status entails completion of the undergraduate major in psychology or its substantial equivalent, and passing of a graduate departmental examination. Graduate students in neighboring fields may participate in certain courses or seminars by consent of the instructor.

201. General Seminar. (No credit) I and II. The Staff
- †204E. Seminar in Principles of Measurement. (2) I and II. Mr. C. W. Brown
- †206E. Seminar in Experimental Psychology. (2) I and II. Mr. W. Brown
Limited to students who are engaged in experimental work.
- *208E. Seminar in Physiological Psychology. (2) I. _____
- 209E. Seminar in Individual Differences. (2) II. Mr. Jarrett
- †210E. Seminar in Constitutional Psychology. (2) I and II. Mr. Tuddenham
- 212E. Seminar in Developmental Psychology. (2) I. Mr. Jones, Mrs. Frenkel-Brunswik, Mrs. Jones

* Not to be given, 1949-1950.

† To be given if a sufficient number of students enroll.

228. Methodological Foundations of Psychology. (3) I. Mr. Brunswik
Prerequisite: course 120 or any acceptable course in history or systems of psychology. Graduate students in philosophy, sociology, biology, or physics may be admitted by consent of the instructor.
Further discussion of history and systems of psychology, with special emphasis on the philosophy of science as applied to psychology. Introspective and objective, molecular and molar, peripheral and central-distal point of view. The status of theory in modern psychology; description versus explanation, idiographic versus statistical versus nomothetic approach.
- 231E. Perception and Representative Experimental Design. (2) I. Mr. Brunswik
- †235E. The Nature of Psychological Change. (2) I and II. Mr. Sherriffs
Examination of the basic principles applicable to the major categories of psychological change such as learning and problem-solving, personality restructuring, and modification of social patterns. Critical evaluation of the constructs available for the study of such change will be undertaken.
240. Personality Assessment. (3) I. Mr. MacKinnon
Lectures and laboratory.
The rationale and practice of procedures for the diagnosis and assessment of personality.
242. Opinions, Beliefs, and Attitudes. (3) I and II. Mr. Crutchfield, Mr. Hyman
Enrollment limited to twenty-five students.
The theory of enduring cognitive organizations, their role in social behavior, their control and change; a critical review of current measurement techniques as used in laboratory and field studies of opinions, beliefs, and attitudes.
244. Social Psychology of the Interview. (3) II. Mr. Ballachey
Lectures and laboratory.
Prerequisite: courses 141 and 145.
Processes of communication in interview techniques used in the social sciences, with special reference to distortions arising from differences in psychosociological frames of reference of the participants.
245. The Methodology of the Social Survey. (3) I. Mr. Ballachey, Mr. Tryon
Prerequisite: course 242 or 3 units of social psychology, and the consent of the instructor.
A laboratory course in the methodology of social survey techniques, covering problems in the designing and carrying out of opinion, attitude, and other types of social surveys.
- 245E. Seminar in Social Psychology. (2) I and II. Mr. Tryon, Mr. Hyman
Enrollment limited to sixteen students.
For students primarily interested in conducting research in social psychology. Students will be expected to prepare an outline for a projected study, do the necessary library research for such a study, and conduct a test run of the study (or pilot study). Seminars will be devoted to a critical discussion of the student's work at each stage.
- 246E. Perception and Personality. (2) II. Mr. MacKinnon, Mrs. Frenkel-Brunswik
An examination of current theory of perceptual and cognitive processes with special attention to these processes as aspects of the personality structure of the individual. Emphasis will be on the experimental approach.
247. Advanced Group Dynamics and Group Therapy. (3) I. Mr. Coffey
Two two-hour sessions a week.
Ways in which groups may be utilized in the training and therapy of

† To be given if a sufficient number of students enroll.

the individual, survey of pertinent literature, and actual experience with group techniques such as role playing, psychodrama, reality testing, as training and therapeutic devices.

Social welfare students, if psychiatric social workers, may be admitted.

- 247E. Seminar in Group Dynamics and Group Therapy. (2) II. Mr. Coffey
 *248E. Seminar in Personality. (2) I. Mr. Sanford
 *249. Experimental Psychodynamics. (3) II. Mr. MacKinnon
 Two hours of lecture and four hours of laboratory work a week to be arranged.

A general survey of the psychodynamics of behavior, with special emphasis upon the experimental literature.

- 249E. Seminar in Dynamic Psychology. (2) I and II. Mr. Erikson
 †250E. Seminar in Animal Psychology. (2) II. Mr. Gilhausen, Mr. Tolman
 261A-261B. Clinical Methods. (3-3) Yr. Mr. Immergluck, Mr. Tuddenham
 Lecture and laboratory; four hours of field work to be arranged.
 Consideration of clinical methods of measurement, interview, and observation.
 262A-262B. Advanced Clinical Diagnostic Testing. (2-2) Yr. Mr. Gough
 262A. Theory and practice of personality testing.
 262B. Scoring and interpretation of the Thematic Apperception Test.
 263A-263B. The Rorschach Method. (2-2) Yr.

Mr. Harris, Mr. Immergluck

Scoring and interpretation of the Rorschach Test.

- 264E-264F. Seminar in Case History. (2-2) Yr.
 Mr. Ballachey, Mr. Coffey, Mr. Sarbin

Prerequisite: course 261B.

The case history method in psychology with emphasis on diagnostic aspects.

- 265E-265F. Advanced Seminar in Case History. (2-2) Yr.
 Prerequisite: course 264F. Mrs. Schumacher, Mr. Sherriffs
 The case history method in psychology with emphasis on therapeutic aspects.

- 266E. Seminar in Theories of Therapy. (2) I. Mrs. Schumacher
 Prerequisite: course 264F.

A critical survey of the major theories upon which psychotherapy is based.

- *267E. Seminar in Medical Psychology. (2) II.
 *268E. Seminar in Abnormal Psychology. (2) I and II. Miss Bridgman
 †285E. Seminar in Applied and Industrial Psychology. (2) I and II.

298. Proseminar in Research Methods. (2) I. Mr. Ghiselli
 Mr. Ballachey, Mr. Crutchfield, Mr. Gough, Mr. Tuddenham
 (Formerly numbered 290.)

Introduction to research in psychology. Problems of experimental design and analysis considered in relation to individual projects.

299. Research. (1-6) I and II. The Staff
 Laboratory, library, or field work as the problem requires.

300. Seminar in the Presentation of Psychological Material. (2) II.
 Mr. Crutchfield
 Critical approach to presentation of psychological material in publication, lectures, demonstrations, etc., with emphasis on content, evidence, and significance of material, and relevant techniques of presentation.

* Not to be given, 1949-1950.

† To be given if a sufficient number of students enroll.

PUBLIC HEALTH

- JESSIE M. BIERMAN, A.B., M.D., M.S.P.H., Professor of Maternal and Child Health.
- HAROLD B. GOTTAAS, M.S., Sc.D., Professor of Sanitary Engineering and Civil Engineering.
- W. McDOWELL HAMMON, A.B., M.D., Dr.P.H., Professor of Epidemiology.
- DOROTHY BIRD NYSWANDER (Dorothy Nyswander Palmer), Ph.D., Professor of Public Health and Lecturer in Education.
- EDWARD S. ROGERS, A.B., M.D., M.P.H., Professor of Public Health and Medical Administration.
- CHARLES EDWARD SMITH, A.B., M.D., Dr.P.H., Professor of Public Health Practice (Chairman of the Department).
- JACOB YERUSHALMY, Ph.D., Professor of Biostatistics.
- ROBERT T. LEGGE, Ph.G., M.D., F.A.C.S., Professor of Hygiene, Emeritus, and Lecturer in Industrial Medicine, Emeritus.
- MARGARET BEATTIE, M.A., Gr.P.H., Associate Professor of Public Health.
- LEON LEWIS, B.S., M.D., F.A.C.P., Associate Professor of Industrial Health.
- WALTER S. MANGOLD, B.S., Associate Professor of Public Health.
- WILLIAM C. REEVES, Ph.D., M.P.H., Associate Professor of Epidemiology.
- WILLIAM W. STILES, B.S., M.D., M.P.H., Associate Professor of Public Health.
- BERNARD D. TEBBENS, A.B., M.Sc., Sc.D., Associate Professor of Industrial Hygiene Engineering.
- CHARLES H. HINE, M.A., Ph.D., M.D., Assistant Professor of Industrial Toxicology and Public Health and Lecturer in Criminology.
- NELL HOLLINGER, Ph.D., Assistant Professor of Laboratory Practice.
- EDITH LINDSAY, M.A., Ed.D., Assistant Professor of Public Health.
- WILLIAM W. SAMPSON, Ph.D., Instructor in Public Health.
- CATHERINE P. ANNON, R.N., M.A., Associate in Public Health.
- NEDRA BELLOC, M.A., Associate in Public Health.
- DORIS BRYAN, R.N., B.S., M.P.H., Associate in Public Health.
- WILLIAM J. HAYES, B.S., Associate in Public Health.
- RICHARD K. LANSING, B.S., Associate in Public Health.
- SARAH MAZELIS, A.B., M.P.H., Associate in Public Health.
- HELEN M. MORTENSON, B.S., M.P.H., Associate in Public Health.
- ETSUKO MURAYAMA, A.B., M.P.H., Associate in Public Health.
- JEAN NAYLOR, B.S., Associate in Public Health.
- CHARLES R. NICEWONGER, M.A., Associate in Public Health.
- FERN SONEDER, M.A., Associate in Public Health.
- WILLIAM F. TAYLOR, A.B., Associate in Public Health.
- ANNE WAYBUR, A.B., Associate in Public Health.



- DWIGHT M. BISSELL, M.A., M.D., M.S.P.H., Lecturer in Public Health.
- HAROLD D. CHOPE, A.B., M.D., Dr.P.H., Lecturer in Public Health.
- DEAN A. CLARK, B.A., B.Sc., M.D., Lecturer in Medical Economics.
- FERN E. FRENCH, M.A., Lecturer in Public Health.
- CARL GOETSCH, B.S., M.D., Lecturer in Public Health.
- HAROLD F. GRAY, M.S., Gr.P.H., Lecturer in Public Health.
- FRANK L. KELLY, M.S., M.D., Dr.P.H., Lecturer in Public Health.
- RICHARD A. KOCH, M.D., M.P.H., Lecturer in Public Health.
- HUGO M. KULSTAD, D.D.S., Lecturer in Public Health.

- EDWIN H. LENNETTE, M.D., Ph.D., Lecturer in Virology.
 WILMA LLOYD, M.A., Lecturer in Developmental Pediatrics.
 W. ALLEN LONGSHORE, A.B., M.D., M.P.H., Lecturer in Public Health.
 MALCOLM H. MERRILL, M.S., M.D., M.P.H., Lecturer in Public Health.
 KARL F. MEYER, A.B., Dr.Phil. (Zurich), Dr.Med. h.c. (Zurich), Lecturer in Public Health.
 RUTH M. PILLSBURY, A.B., M.D., Lecturer in Public Health.
 JAMES H. SKILLIN, M.S., Lecturer in Public Health.
 TRACY I. STORER, Ph.D., Lecturer in Public Health.
 RICHARD J. STULL, A.B., Lecturer in Hospital Administration.
 E. RICHARD WEINERMAN, A.B., M.D., M.P.H., Visiting Associate Professor of Medical Economics.
 KENT ZIMMERMAN, A.B., M.D., Lecturer in Public Health.

Letters and Science List.—Courses 5A–5B, 35, 106, 160A–160B, 163A–163B are included in the Letters and Science List of Courses. For the regulations governing this list, see page 85.

LOWER DIVISION COURSES

- 5A. Elementary Public Health. (3) I and II. Mr. Stiles
 Lectures, three hours.
 A survey of the entire field of public health, including field observations and a consideration of the evolution of disease prevention and control; the social, medical, and economic aspects of sickness, disability, and death.
- 5B. Elementary Public Health. (3) I and II. Mr. Stiles
 Lectures, three hours.
 Prerequisite: course 5A.
 Continuation of 5A.
15. Public Health Laboratory Procedures. (2) II. Mr. Skillin
 Enrollment limited to students in the special curriculum for sanitarians.
 A study of public health laboratory procedures, methodology, significance, interpretation, and reliability. A descriptive course with lectures, laboratory practice, and demonstrations, including field trips, designed to develop an understanding of the procedures and their public health significance rather than proficiency in laboratory methods.
16. Elementary Public Health Statistics for Sanitarians. (2) II.
 The Staff (Mrs. French in charge)
 Lecture, one hour; laboratory, three hours.
 Enrollment limited to students in the special curriculum for sanitarians.
 Methods of collecting, tabulating, and graphing, with special emphasis on data relating to diseases and their distribution; and elementary methods of analysis.
35. Personal Health Problems. (3) I and II. Miss Lindsay
 Lectures, three hours.
 Enrollment limited to students in the lower division. Sections limited to fifty students.
 A consideration of the factors which determine physical, mental, and emotional health and influence the prevention of disease. Application of these factors to the solution of individual health problems.
49. Field Training Course. (No credit) (Given during the four weeks following the close of each semester.) Mr. Mangold, Mr. Sampson, Mr. Skillin
 Prerequisite: consent of the instructor.
 Field training in health departments and/or military establishments for learning administrative methods and practical procedures in environmental sanitation.

UPPER DIVISION COURSES

- 100A. Introduction to Health Administration. (3) I and II. Mr. Kelly
(Formerly numbered 105.)
Prerequisite: course 5A-5B or consent of the instructor.
Principles of public administration and fundamentals of organization and administration in public health.
- 100B. Introduction to Health Administration. (3) II.
Mr. Weinerman, Mr. Stull
Prerequisite: course 100A or consent of the instructor.
Principles of hospital and medical care organization and administration.
- 101A-101B. Laboratory in Administration. (1-1) Yr.
Laboratory, three hours. Mr. Rogers, Miss Sneider
Discussion and exercises in the fundamental skills of administration as applied to public health practice.
- 103A-103B. Hospital Organization and Management. (3-3) Yr. Mr. Stull
Prerequisite: Business Administration 1A-1B. Restricted to students enrolled in the School of Public Health who have consent of the instructor.
Consideration of the fundamentals of organization, business and financial management, personnel management, plant operation, staff organization, and community relationships as applied to hospital administration.
106. Medical Sociology. (3) I. Mr. Weinerman
A consideration of the social and economic factors relating to health, disease, and the receipt of medical care.
- †108. Advanced Problems in Public Health Administration. (1-5) I and II.
Mr. Rogers
- †109. Advanced Problems in Medical Administration. (1-5) I and II.
Mr. Weinerman
110. Environmental Sanitation. (3) I and II. Mr. Gray
Fundamentals of housing, heating, ventilation, lighting, water supply, waste disposal, insect and rodent control, and control of milk and other food supplies.
111. Environmental Sanitation. (1) I and II. Mr. Gotaas, Mr. Mangold
A condensed presentation of the principles and practices of environmental sanitation for advanced public health students.
112. Control of Rodents Affecting the Public Health. (2) I and II.
Prerequisite: consent of the instructor. Mr. Sampson
The role of the common rodents in the transmission and causation of diseases of human beings and domesticated animals; other relations to human affairs, identification of species; principles governing control.
- 113A. Principles and Practices in Sanitary Inspection. (3) I.
Mr. Sampson, Mr. Skillin
Lectures, two hours; laboratory or field trips, three hours.
Prerequisite: course 110 or consent of the instructor.
Objectives and special techniques in general sanitation covering communicable disease control, water and sewage, housing, ventilation, lighting, and vector control.
- 113B. Principles and Practices in Sanitary Inspection. (3) II.
Mr. Mangold, Mr. Skillin
Lectures, two hours; laboratory or field trips, three hours.
Prerequisite: course 110 or consent of the instructor.
Objectives and special techniques in food sanitation covering milk, meat, markets, restaurants, and processing plants.

† To be given if a sufficient number of students enroll.

114. Advanced Problems in Sanitation. (1-5) I and II. Mr. Mangold
125. Child Hygiene. (3) I. Miss Bierman, Mrs. Bryan
Lectures, three hours; conferences, and field observations.
A consideration of conditions pertaining to the health of children from the time of conception to the end of puberty.
131. Health Education Laboratory. (1) II. Miss Nyswander
Prerequisite: open only to graduate students in public health who have been enrolled in the School of Public Health for one semester or who have the consent of the instructor.
Emphasis will be placed on techniques of teaching health to adults through the media of radio, films, slides, posters, press, printed materials, and lectures. Research in these fields will be evaluated and exercises in preparing and using materials will be included.
132. Group Study in Health Instruction. (2) II. Miss Lindsay
Prerequisite: open to seniors majoring in health education and graduate students in public health.
Considerations basic to health instruction with community groups. Evaluation of objectives, methods, and resource materials.
134. Community Health Education. (2) I. Miss Nyswander
Primarily for students majoring in some area of health work who have taken basic courses in biological sciences, education, and psychology. Theory and field problems in community health organization.
135. Individual Health. (3) I. Miss Lindsay
Lectures, three hours.
A consideration of fundamental physiological mechanisms and application to promotion and protection of health.
145. Community Control of the Communicable Diseases. (3) I and II.
Lectures, three hours. Mr. Bissell
The epidemiology and community control of communicable diseases, including tuberculosis and the venereal infections.
- 147A. Principles of Epidemiology. (2) I. Mr. Hammon, Mr. Longshore, Mr. Reeves
Prerequisite: knowledge of medical microbiology at least equivalent to that presented in Bacteriology 107. Recommended: Bacteriology 101, and Zoölogy 140 or Entomology 117.
Principles of epidemiology and a study of the infection chains of certain type diseases.
- 147B. Applied Epidemiology. (2) II. Mr. Hammon, Mr. Longshore, Mr. Reeves
Discussion and lectures, two hours; laboratory, three hours. Separate discussion hours for those with an M.D. degree and other graduate students with suitable background in communicable disease studies.
Prerequisite: course 147A or 245 and 162 or 261, or consent of the instructor.
Methods of investigating epidemics, collection of data, their analysis, and making a report.
- †149. Advanced Problems in Epidemiology. (1-5) I and II. Mr. Hammon, Mr. Longshore
Prerequisite: course 147B or consent of the instructor.

† To be given if a sufficient number of students enroll.

- 150A. Clinical and Public Health Laboratory Procedures. (8) I.
The Staff (Miss Hollinger in charge)
Prerequisite: Biochemistry 103; and Bacteriology 101 (may be taken concurrently), and consent of the instructor. Enrollment limited to forty students.
Basic principles and laboratory methods in clinical chemistry, hematology, and mycology, as required in clinical and public health practices.
- 150B. Clinical and Public Health Laboratory Procedures. (8) II.
The Staff (Miss Beattie in charge)
Prerequisite: Bacteriology 101, and consent of the instructor.
Enrollment limited to forty students.
Laboratory identification of the etiological agents of communicable diseases and bacteriological and chemical examination of water, milk, and utensils.
153. Applied Biology of Sanitation. (4) I. Mr. Skillin
Lectures, two hours; laboratory and field studies, six hours.
Prerequisite: Bacteriology 101 or 107. Primarily for students in the public health sanitation curriculum, but open to others with consent of the instructor.
Principles of the life sciences relevant to control of environmental sanitation, and techniques of their application.
- †154. Advanced Problems in Public Health Laboratory. (1-5) I and II.
Miss Beattie, Miss Hollinger
Prerequisite: consent of the instructor.
Special investigations of public health and clinical laboratory problems.
- †155. Optical and Electrical Techniques. (2) II. Miss Hollinger
Lecture, one hour; laboratory, to be arranged.
Prerequisite: consent of the instructor. Enrollment limited.
The applications of optical and electrical methods to analysis in biological laboratories.
- 160A. Biometry. (3) I and II. Mr. Taylor
Lectures, two hours; laboratory, three hours.
Prerequisite: open only to students who have completed at least 8 units of laboratory courses in the biological sciences.
Students who have completed courses in statistics may enroll only with the consent of the instructor.
Elements of statistical analysis; introduction to the methods of statistical analysis and their applications in the fields of the biological sciences.
- 160B. Biometry. (3) II. Mr. Taylor
Lectures, two hours; laboratory, three hours.
Prerequisite: course 160A, or consent of the instructor.
Bivariate distributions, elementary methods of sampling, introduction to analysis of variance, special methods applicable to biological data.
- 161A. Applied Biostatistics. (3) I. Mrs. French
Lectures, two hours; laboratory, four hours.
Prerequisite: open only to students who have completed course 5A-5B, or who have the consent of the instructor.
Elements of vital statistics and demography. Includes consideration of problems of registration, enumeration, morbidity and mortality statistics.

† To be given if a sufficient number of students enroll.

- 161B. Applied Biostatistics. (4) II. Mr. Yerushalmy
Lectures, two hours; laboratory, six hours.
Prerequisite: course 161A.
Extension of methods introduced in 161A to more advanced problems.
Methods of establishing record systems for health activities including case registers for chronic diseases; evaluation and analysis.
162. Public Health Statistics. (3) I and II. Mr. Yerushalmy, Mrs. French
Lectures, two hours; laboratory, three hours.
An applied course in public health statistics designed primarily for students in the School of Public Health not majoring in biostatistics. Fall semester enrollment limited to graduate students; spring semester to undergraduate students.
- †163. Demography. (2) II. Mr. Yerushalmy
Lecture, one hour; laboratory, three hours.
Prerequisite: course 160A or 161A or consent of the instructor.
Introduction to demography and population problems.
- †164. Advanced Biometry. (2) I. Mr. Yerushalmy
Lecture, one hour; laboratory, three hours.
Prerequisite: course 160B.
Extension of methods introduced in 160B including methods of small samples, analysis of variance.
- †169. Advanced Biostatistics. (1-5) II.
The Staff (Mr. Yerushalmy in charge)
Prerequisite: courses 160B and 161B.
Advanced course for students majoring in biostatistics.
170. Introduction to Occupational Health and Industrial Hygiene. (3) I and II. Mr. Lewis
Lectures, three hours.
A survey of the field of industrial hygiene and occupational health problems. Discussion of public and private organizations concerned with the health of the industrial worker; common occupational hazards causing morbidity; industrial safety and environmental control; medical care and compensation for disability from industrial accident and disease.
171. Industrial Environment Control: Sanitary Air Analysis. (2) II. Mr. Tebbens
Prerequisite: Chemistry 5 or Civil Engineering 123; Physics 1C-1D or the equivalent; Mechanical Engineering 103 or Civil Engineering 110.
Physical, chemical, and sanitary analysis of the condition of the air and other environmental factors affecting the health and welfare of workers in industry. Application of principles of sanitation in industry.
172. Industrial Toxicology. (2) II. Mr. Lewis, Mr. Hine
Prerequisite: Chemistry 5 and 9, Physics 1C-1D, Physiology 1-1L; or equivalent courses.
Chemical and clinical laboratory techniques applied to investigation of toxic manifestations of industrial hazards.
186. Control of Venereal Diseases. (2) I and II. Mr. Koch
Discussion, and field observation, two hours.
Prerequisite: consent of the instructor.
Study of administrative methods, epidemiology, etiology, treatment, prophylaxis, and health education pertaining to control of the venereal diseases in civilian and military communities.

† To be given if a sufficient number of students enroll.

187. Medical Background for Public Health. (2) I. Mr. Lewis
 Observation, six hours.
 Prerequisite: consent of the instructor.
 Preventive and remedial medical practice illustrated by ward and clinic visits, conferences, and demonstrations. The nature of disease and the basis of therapy are presented to acquaint the nonmedical health worker with the major causes of morbidity.
189. Nutrition Problems in Public Health. (1) II. _____
 Lecture, one hour.
 Study of the application of nutrition knowledge to public health.
198. Directed Group Study. (1-5) I and II.
 The Staff (Mr. Smith in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Smith in charge)

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 163)
- 200A-200B. Principles of Public Health Organization and Administration.
 (3-3) Yr. Mr. Rogers, Miss Sneider
 Lectures, three hours.
 A systematic study of the principles of organization and administration and of their application to public health practice.
- 203A-203B. Seminar in Hospital Administration. (2-2) Yr. Mr. Stull
- 206A-206B. Seminar in Medical Care Administration. (2-2) Yr.
 Mr. Weinerman
- 209A-209B. Seminar in Public Health Administration. (1-1) Yr. Mr. Rogers
213. Advanced Study in Sanitation. (1-5) I and II. Mr. Mangold, Mr. Gray
- 214A-214B. Seminar in Sanitation. (2-2) Yr. Mr. Mangold
224. Seminar in Public Health Nursing Administration. (1) I and II. _____
227. Seminar in School Health Administration. (2) II.
 Miss Bierman, Miss Nyswander
 Consideration of the principles basic to organization, administration, and supervision of school health programs in elementary and secondary schools. Health services, environmental factors, communicable disease control, and hygiene of the school day. Students will undertake field studies.
- 228A. Group Study in Maternal Health. (2) II. Miss Bierman, Mr. Goetsch
 Prerequisite: open to those with an M.D. degree, with the consent of the instructor.
 Study of obstetric problems and practice having public health significance. Field work.
- 228B. Group Study in Child Health and Development. (2) II.
 Miss Bierman, Miss Lloyd, Miss Pillsbury
 Prerequisite: open to those with an M.D. degree, with the consent of the instructor. Course 228A is not prerequisite to 228B.
 Study of health and developmental problems of infants and young children. Offers opportunity for intensive work with young children and their parents.
- 229A-229B. Seminar in Maternal and Child Health Administration. (1-1) Yr.
 Miss Bierman
 Prerequisite: open to physicians and others with the consent of the instructor.
 Deals with problems of maternity and infancy, preschool years, later

childhood, adolescence, handicapped children, and the public health programs designed to deal with them. Students will undertake field studies.

233. Group Work Procedures in Health Education. (2) I. Miss Nyswander
Prerequisite: open only to graduate students in public health.
A consideration of the more usual techniques of group work together with investigations of the social and psychological factors which determine the effectiveness of group work in promoting public health activities.
- 234A-234B. Seminar in Community Health Education. (2-2) Yr. Miss Nyswander
Prerequisite: open to graduate students who are taking or have taken course 200A-200B.
Problems in relating the philosophy of health education to public health administration. Field observations during second semester.
238. Seminar in Mental Health. (1) II. Mr. Zimmerman
245. Biology of Infectious Diseases (Epidemiology). (4) I. Mr. Hammon in charge
Lectures and demonstrations, six hours.
Prerequisite: an M.D. degree or consent of the instructor for those with adequate background in medical bacteriology, immunology, and medical entomology. To be taken concurrently with course 261.
Discussion of parasite, vector, reservoir host, and the infection chain. Consideration of most recent advances in microbiological laboratory methods and interpretation of results, particularly as applied to epidemiological investigations.
- †246. Epidemiometrics. (2) II. Mr. Hammon, Mr. Yerushalmy
Seminar, two hours; laboratory, two hours.
Prerequisite: courses 245 and 261, or 160A and 161A.
Quantitative methods in epidemiology, including those used in the study of chronic disease, theoretical and experimental epidemics, and other statistical methods.
- †248. Advanced Problems in Epidemiology. (1-5) I and II. Mr. Hammon
Prerequisite: courses 245 and 147B; and 261 or 160A and 161A.
- †249A-249B. Seminar in Epidemiology. (1-1) Yr. Mr. Hammon
- †254A-254B. Seminar in Public Health Laboratory. (1-1) Yr. Miss Beattie, Miss Hollinger, Mr. Merrill
- †260. Biostatistics. (4) I. Mr. Yerushalmy
Prerequisite: primarily for candidates for the degree of Master of Public Health in biostatistics.
Quantitative methods in medicine and public health. Includes study of discrete and continuous distributions of a single variable, bivariate distributions, sampling.
- *261. Public Health Statistics and Biometry. (4) I. Mr. Yerushalmy
Lectures, two hours; laboratory, six hours.
Prerequisite: primarily for students in the health officers' curriculum, but open to others with the consent of the instructor.
Technics of biometric analysis useful in elucidating laboratory and field studies and of particular value in epidemiological investigation. Procedures of enumeration, registration, survey, and demographic investigation which are of importance to public health officers.
262. Advanced Biostatistics. (3) II. Mr. Yerushalmy
Lectures, two hours; laboratory, three hours.
Prerequisite: course 260.
Extension of methods introduced in course 260 to more advanced problems.

† To be given if a sufficient number of students enroll.

* Not to be given, 1949-1950.

- †263. Administrative Statistics. (3) I and II. Mr. Yerushalmy
Lectures, two hours; laboratory, three hours.
Prerequisite: course 161B or consent of the instructor.
Problems associated with the establishment and maintenance of record systems in medical institutions and public health agencies. Of use primarily in program administration.
- †264. Biostatistical Methods in Medical and Public Health Research. (2) II. Mr. Yerushalmy
Lecture, one hour; laboratory, three hours.
Prerequisite: course 260 or 261.
Biostatistical methods useful in field studies in medicine and public health. Planning of field studies and scientific evaluation.
- †265. Special Biostatistics Methods. (2) II. Mr. Yerushalmy
Lecture, one hour; laboratory, three hours.
Rates and ratios, life tables, and other methods applicable to the study of chronic diseases.
- †268. Special Studies in Biostatistics. (1-5) I and II. The Staff (Mr. Yerushalmy in charge)
Research projects undertaken by students under the direction of the staff.
- †269A-269B. Seminar in Biostatistics. (1-1) Yr. Mr. Yerushalmy
- †274A-274B. Seminar in Industrial Health. (1-2) Yr. The Staff (Mr. Lewis in charge)
- 284A-284B. Seminar in Public Health Dentistry. (1-1) Yr. Mr. Kulstad
287. Clinical Problems in Public Health. (1-4) I and II. Mr. Smith in charge
Deals with selected clinical subjects of major importance to public health and presents clinical observations and discussions of the most recent advances in diagnosis, treatment, and prevention.
- 289A-289B. Seminar in Public Health Nutrition. (2-2) Yr. ———
297. Directed Field Study. (No credit.) (Given immediately following the close of each semester.) The Staff (Mr. Smith in charge)
298. Directed Group Study of Graduate Students. (1-5) I and II. The Staff (Mr. Smith in charge)
299. Special Study for Graduate Students. (1-5) I and II. The Staff (Mr. Smith in charge)

ROMANCE PHILOLOGY

FRANCIS J. CARMODY, Ph.D., Professor of French.
YAKOV MALKIEL, Ph.D., Associate Professor of Romance Philology.
RONALD N. WALPOLE, Ph.D., Associate Professor of French.

Courses 201, 202, and 203 are open only to students who have had at least one year of graduate study, including Old French and either Italian Dialects or Old Spanish.

200. Linguistic History of the Roman Empire. (2) I. Mr. Malkiel
201. Late Latin Language and Literature. (2) I. Mr. Malkiel
202. General Romance Linguistics. (2) II. Mr. Malkiel
- *203. Old Provençal. (2) II. Mr. Walpole

† To be given if a sufficient number of students enroll.

* Not to be given, 1949-1950.

†204A–204B. Comparative Romance Phonetics. (1–1) Yr. Mr. Carmody
Prerequisite: course 202.
Special attention will be paid to the Western Romance Group.

Historical French Grammar (see French 201A–201B).

Reading and Interpretation of Typical Old French Texts (see French 206A–206B).

*Italian Philology and Dialects (see Italian 201A–201B).

Old Spanish (see Spanish 212A–212B).

SCANDINAVIAN LANGUAGES AND LITERATURE

ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology
(Chairman of the Department).

ASSAR GÖTRIK JANZÉN, Ph.D., Professor of Scandinavian Languages and
Literature.

Letters and Science List.—All undergraduate courses in Scandinavian Languages and Literature are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

LOWER DIVISION COURSES

- 1A–1B. Elementary Swedish. (3–3) Yr. Mr. Janzén
1A. Swedish grammar, composition, reading.
1B. Advanced composition, conversation, and reading of selected novels and plays.
- *3A–3B. Elementary Norwegian. (3–3) Yr. Mr. Janzén
3A. Norwegian grammar, composition, reading.
3B. Advanced composition, conversation, reading of selected novels, plays, and lyrics.
- *4. Elementary Danish. (3) II. Mr. Janzén
Danish grammar, composition, reading.

UPPER DIVISION COURSES

- *100A–100B. History of Scandinavian Literature. (3–3) Yr. Mr. Janzén
Survey course: reading of selected works of Danish, Swedish, and Norwegian literature in translation; lectures.
- 101A–101B. Advanced Swedish. (3–3) Yr. Mr. Janzén
Intensive reading of masterpieces; composition and conversation.
106. History of Scandinavian Drama. (3) I. Mr. Janzén
Reading of Danish, Swedish, and Norwegian plays in translation; lectures.
107. The Plays of Ibsen. (3) II. Mr. Janzén
The major dramas read in translation.
199. Special Study for Advanced Undergraduates. (1–3) I and II. Mr. Janzén

† To be given if a sufficient number of students enroll.

* Not to be given, 1949–1950.

SLAVIC LANGUAGES

WACLAW LEDNICKI, Ph.D., Professor of Slavic Languages (Chairman of the Department).

GLEB STRUVE, B.A., Professor of Russian.

GEORGE R. NOYES, Ph.D., LL.D., Litt.D., Professor of Slavic Languages, Emeritus.

†OLEG A. MASLENIKOV, Ph.D., Associate Professor of Slavic Languages.

LYDIA I. PENNELL, A.B., Associate in Russian.



FRANCIS J. WHITFIELD, Ph.D., Acting Associate Professor of Slavic Languages (Institute of Slavic Studies).

DMITRY F. GRIGORIEFF, M.A., Lecturer in Russian.

GEORGE C. GUINS, LL.M., Lecturer in Russian and Political Science.

ELIZABETH MALOZEMOFF, Ph.D., Lecturer in Russian.

LUDMILA A. PATRICK, M.A., Lecturer in Russian.

BOŽENA POSPÍŠILOVÁ, Ph.D., Lecturer in Czech.

NOEL A. VOGÉ, M.A., Lecturer in Serbo-Croatian.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Whitfield.

The Major.—Required: 24 units, of which 12 units must be in upper division language courses in the Department of Slavic Languages and at least one lecture course in the department; not more than 6 units may be chosen from other departments. Courses in other departments that will be accepted as part of the major are upper division courses in the Greek, Latin, or Gothic languages, in phonetics or comparative linguistics, and any upper division courses in European literature, or in history, that may be specifically approved by the department as combining properly with the work in Slavic languages. Such courses are, for example, those given by the English Department on the novel and on nineteenth-century poetry, and by the History Department on modern European history, particularly the history of eastern Europe.

Honor Students in the Upper Division.—Candidates for honors must do at least 24 units of upper division work in the department, of which at least 12 units must be of grade A and the remaining 12 units must average not below grade B. The 24 units must include at least 18 units of work in upper division language courses in the department.

LOWER DIVISION COURSES

1. Beginning Russian. (4) I and II. Mr. Whitfield in charge
Two lectures and three recitation hours weekly. See also course 18A.
 2. Elementary Russian. (4) I and II. Mrs. Patrick in charge
Two lectures and three recitation hours weekly. Continuation of course
1. See also 18B.
 3. Intermediate Russian. (2) II. Mrs. Patrick
Continuation of course 2. Reading, composition, translation.
- *6A-6B. Elementary Polish. (3-3) Yr. Mr. Lednicki
10A-10B. Elementary Serbo-Croatian. (3-3) Yr. Mr. Vogé

† Sabbatical leave in residence, 1949-1950.

* Not to be given, 1949-1950.

- 14A-14B. Elementary Czech. (3-3) Yr. Miss Pospíšilová
 18A-18B. Elementary Russian Conversation. (2-2) Yr. Beginning each semester. Mrs. Pennell
 Open only to students who also are taking course 1 or 2.

UPPER DIVISION COURSES

A. Language Courses

- 102A-102B. Second-year Russian. (3-3) Yr.
 Mr. Struve, Mr. Guins, Mrs. Malozemoff, Mrs. Patrick
 Prerequisite: course 3 or course 2 with a grade of at least B.
- 103A-103B. Third-year Russian. (3-3) Yr.
 Mr. Guins, Mrs. Malozemoff, Mrs. Patrick, Mr. Struve
- 104A-104B. Fourth-year Russian. (3-3) Yr. Mr. Lednicki
- *105. Written Translation from Slavic Languages. (1-3) I and II.
 The Staff (Mr. Maslenikov in charge)
 This course may be taken only in combination with some other course in Slavic languages.
- 107A-107B. Second-year Polish. (3-3) Yr. Mr. Whitfield
- *108A-108B. Third-year Polish. (3-3) Yr. Mr. Lednicki
- *111A-111B. Second-year Serbo-Croatian. (3-3) Yr. Mr. Voge
- *112A-112B. Third-year Serbo-Croatian. (3-3) Yr. Mr. Voge
- *115A-115B. Second-year Czech. (3-3) Yr. Miss Pospíšilová
- 116A-116B. Third-year Czech. (3-3) Yr. Miss Pospíšilová
- 119A-119B. Intermediate Russian Conversation. (2-2) Yr. Mr. Grigorieff
- 120A-120B. Advanced Russian Conversation. (2-2) Yr. Mr. Grigorieff
- *121. The Pronunciation of Russian. (2) I. Mr. Maslenikov
 Phonetics and accentuation.
- *122. The Russian Language. (2) II. Mr. Maslenikov
 Morphological and etymological structure.
123. Russian Syntax. (2) II. Mr. Whitfield
- 124A-124B. Advanced Russian Composition. Mrs. Patrick
 Open to students enrolled in Russian 103 or 104.
198. Advanced Group Work. (1-3) I and II. The Staff
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Lednicki in charge)

B. Lecture Courses on Slavic Literature

These courses require no knowledge of any language other than English. They are open to all students of at least junior standing and, with the consent of the instructor, to properly qualified sophomores.

130. Introduction to Russian Literature. (3) I. Mr. Lednicki
 Survey of Russian literature and intellectual trends.
 Open also to sophomores who in the judgment of the instructor are properly qualified, including those enrolled in courses in the Slavic languages.
- *131. Russian Literature (1880-1917). (3) II. Mr. Maslenikov
 Garshin, Chekhov, Gorky, Andreyev, Bunin, Kuprin, Korolenko, the Symbolists, and others.
132. Russian Literature Since 1917. (2) I. Mr. Struve
 Alexey Tolstoy, Gladkov, Fadeyev, Fedin, Leonov, Sholokhov, Simonov, Aldanov, Nabokov, and others.

* Not to be given, 1949-1950.

- *133A-133B. Russian Novelists of the Nineteenth Century (except Tolstoy and Dostoyevski). (2-2) Yr. Mr. Lednicki
Prerequisite: course 130 or consent of the instructor.
- *133C-133D. Dostoyevski and Tolstoy. (2-2) Yr. Mr. Lednicki
133C: Dostoyevski; 133D: Tolstoy.
Prerequisite: course 130 or consent of the instructor.
134. Russian Literature and Folklore. (2) II. Mrs. Patrick
Development of the literature, exclusive of the novelists, and general features of the folklore.
- *135. The Russian Drama. (2) II. Mrs. Patrick
Survey of Russian drama from the seventeenth century to the twentieth.
- *136. Russian Poetry. (2) II. Mr. Maslenikov
Prerequisite: courses 103A and 130 or equivalent.
Study of form and content from the Byliny to present-day poetry.
- *138. Modern Russia. (2) I. Mr. Struve
Prerequisite: junior standing.
Life and intellectual currents of modern Russia as reflected primarily in Russian literature.
- *144. Slavic Folklore. (2) I. Mr. Whitfield
150. Survey of Polish Literature. (3) II. Mr. Lednicki
The development of Polish literature from the sixteenth century to the present.
- *152. Polish Romantic Poetry. (2) II. Mr. Lednicki
Mickiewicz, Slowacki, and Krasiński.
- †160. Survey of Czech and Slovak Literature. (2) II. Miss Pospíšilová
The development of Czech and Slovak literature from the sixteenth century to the present.
- *170. Survey of South Slavic Literature. (2) II. Mr. Whitfield
- 180A-180B. Survey of Russian Culture. (2-2) Yr. Mr. Guins
180A. Origin of Russian culture and its peculiarities. Eastern and Byzantine influences. Rapprochement with the West and development of a national consciousness, literature, art, religion, science, and social institutions in the seventeenth and eighteenth centuries.
180B. Development of Russian material, social, and spiritual culture since the beginning of the nineteenth century and its features before and after the Revolution.
- *188. The Slavic-Speaking World. (1) II. Mr. Lednicki
Survey of Slavic-speaking peoples.
190. Introduction to Slavic Linguistics. (2) I. Mr. Whitfield

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

Language Courses

- *200. Slavic Bibliography. (1) II. The Staff
- 224A-224B. Old Church Slavic. (2-2) Yr. Mr. Whitfield
Relation to other Indo-European languages. The textbook for this course is in German.
- †225. Old Church Slavic and Early Russian. (2) II. Mr. Maslenikov
Continuation of course 224A-224B. Relation of Old Church Slavic to Russian and other Slavic languages.

* Not to be given, 1949-1950.

† To be given if a sufficient number of students enroll.

226. Historical Russian Grammar. (2) I. Mr. Maslenikov
 †227. Historical Polish Grammar. (2) I. Mr. Whitfield
 Prerequisite: course 224A-224B.
 †228. Historical Serbo-Croatian Grammar. (2) II. Mr. Whitfield
 Prerequisite: course 224A-224B.
 *229. Historical Czech Grammar. (2) II. _____
 Prerequisite: course 224A-224B.

Literature Courses

- *237. Early Russian Literature. (2) I. Mr. Maslenikov
 *238. Eighteenth-Century Russian Literature. (2) I. Mr. Struve
 240. Pushkin. (2) I. Mr. Lednicki
 *245. Studies in the Russian Novel. (2) I. Mr. Lednicki
 246. Twentieth-Century Russian Literature. (2) II. Mr. Struve
 247. The Russian Critics. (2) I. Mr. Struve
 †248. The Symbolist Movement. (2) II. Mr. Maslenikov
 *250. Mickiewicz. (2) I. Mr. Lednicki
 298. Individual Work. (1-4) I and II.

The Staff (Mr. Lednicki in charge)

Graduate students will be offered opportunities for independent reading and study. Credit will be assigned according to the amount of work done.

INSTITUTE OF SLAVIC STUDIES

The Institute of Slavic Studies was established in 1948, with the assistance of the Rockefeller Foundation, for the purpose of encouraging graduate teaching and research on the Slavic nations, both Russian and non-Russian. The Institute is University-wide in scope and functions on the several campuses. Its organization consists of a Director, an Advisory Board, an Academic Staff which includes members of the faculty giving instruction in Slavic studies in the various departments, and additional members appointed on the budget of the Institute. Particular attention is given to the development of scholars in the social sciences and the humanities. Courses in the fields of Slavic studies in the departments of Anthropology, Economics, Geography, History, Political Science, and Slavic Languages and Literature may be selected for inclusion in the curriculum for the doctorate in Slavic studies.

Further information may be obtained from the Director, Mr. Robert J. Kerner, Room 11, Charles Franklin Doe Library.

SOCIAL WELFARE

MILTON CHERNIN, Ph.D., Professor of Social Welfare (Chairman of the Department).

WALTER FRIEDLANDER, Ph.D., Associate Professor of Social Welfare.

DAVIS McENTIRE, Ph.D., Associate Professor of Social Welfare.

MAURINE McKEANY, Ph.D., Associate Professor of Social Welfare and Supervisor of Field Work.

PEARL L. AXELROD, M.A., Assistant Professor of Social Welfare and Supervisor of Psychiatric Field Work.

RUTH COOPER, M.A., Assistant Professor of Social Welfare.

HAZEL H. FREDERICKSEN, M.A., Assistant Professor of Social Welfare.

GORDON HEARN, Ph.D., Assistant Professor of Social Welfare.

† To be given if a sufficient number of students enroll.

* Not to be given, 1949-1950.

MARTIN B. LOEB, A.B., Assistant Professor of Social Welfare.



PEARL H. BERMAN, M.S.S., Lecturer in Social Welfare and Field Work Supervisor.

RALPHYNE B. DEVERILL, M.S., Lecturer in Social Welfare and Field Work Supervisor.

SALLY DEWEES, M.S., Lecturer in Social Welfare.

MARY E. DUREN, M.S., Lecturer in Social Welfare.

ANNA MAENCHEN, Ph.D., Lecturer in Social Welfare.

RUTH H. MORGAN, M.S.W., Lecturer in Social Welfare and Field Work Supervisor.

JULIA R. TARNOPOLO, M.S.W., Lecturer in Social Welfare.

HASSELLTINE BYRD TAYLOR, J.D., Ph.D., Lecturer in Social Welfare.

ERNESTINE WERTHEIMER, M.A., Lecturer in Social Welfare and Field Work Supervisor.



DOUGLAS G. CAMPBELL, M.D., Lecturer in Social Welfare and Assistant Clinical Professor of Psychiatry and Lecturer in Neuroanatomy in the Medical School.

PORTIA B. HUME, Lecturer in Social Welfare, Assistant Clinical Professor of Psychiatry and Associate Psychiatrist, Student Health Service.

CARL H. JONAS, M.D., Lecturer in Social Welfare and Assistant Clinical Professor of Psychiatry in the Medical School.

NORMAN REIDER, M.D., Lecturer in Social Welfare and Assistant Clinical Professor of Psychiatry in the Medical School.

ALEXANDER SIMON, M.D., Lecturer in Social Welfare and Associate Professor of Psychiatry in the Medical School.

The School of Social Welfare administers a two-year graduate program of training for social work, leading to the degree of Master of Social Welfare. For information regarding admission to and requirements prescribed for the graduate program, see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

The department administers the group major in social welfare (in the College of Letters and Science), a preprofessional preparatory program, which is described on page 84.

Letters and Science List.—Courses 100, 101A, 101B, 106, and 110A–110B are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

UPPER DIVISION COURSES

100. The Field of Social Welfare. (3) I. Mrs. Fredericksen
A survey of the field of social welfare and social work functions. The rise of modern social work and the distinctive techniques of the social work profession. Designed to acquaint undergraduates and nonprofessional students with the field of social welfare. Not open to students who are taking or have completed course 110A–110B.
- 101A–101B. Crime and Delinquency. (2–2) Yr. Mr. Chernin
101A. Survey of the problem of adult crime and juvenile delinquency, including nature and extent, statistics, associated factors, processes in the administration of criminal justice, and the juvenile court.
101B. Survey of the treatment of adult and juvenile delinquents, including penal and correctional institutions, private agencies, parole and probation, and crime prevention activities.
102. Methods in Social Work. (3) II. Mr. Loeb
Prerequisite: course 110A (may be taken concurrently). Open only to seniors in the social welfare major.
An introduction to the techniques or skills of social case work, social

- group work, and community organization, designed to acquaint undergraduates with the leading concepts of these methods and with the literature. Observational visits to agencies and institutions will be arranged.
104. Health and Medical Care. (2) I and II. Miss Cooper in charge
Prerequisite: senior standing.
Health as a social problem; elementary medical information for social workers; the major health and medical services, public and private.
105. Psychiatry and Social Welfare. (2) I. Mr. Campbell
Prerequisite: senior standing and completion of Psychology 160, 162, or 168.
Elementary psychiatry for students of social welfare. An introduction to the development of the normal person and to deviations from the norm, including the neuroses and psychoses.
106. Community. (2) II. Mr. Loeb
The concept of community; the major institutions of the modern community; community surveys in the United States; how to study the community; the sociological background of "community organization."
108. Race Relations. (2) I. Mr. Loeb
The composition and background of American population; biological, social, and cultural aspects of race; interracial tensions in America; techniques for improving race relations.
- 110A-110B. The Social Services. (3-3) Yr. Mr. Friedlander
Course 110A is prerequisite to 110B.
110A. History of the development of the social services in England and the United States from the British Poor Law to the present. In 1949-1950 course 110A will be given in the spring semester also.
110B. Present system of social services in the United States. Problems of organization and administration of public assistance, child welfare, medical care, mental hygiene, corrections, veterans' services, and social insurance.
191. Function and Organization of the Modern Social Services. (2) I and II. Mr. Friedlander
Designed primarily for graduate students who have not completed the group major in social welfare. Not available to those who have completed course 110A-110B.
199. Special Study for Advanced Undergraduates. (1-3) I and II. The Staff (Mr. Friedlander in charge)
Prerequisite: senior standing and approval of the major adviser.
Individual readings, research, and conferences with instructor in a field chosen by the student with approval of the instructor.

GRADUATE AND PROFESSIONAL COURSES

These courses are intended primarily for students enrolled in the graduate program of the department, and are limited to such students except by permission of the department.

201. Law and Social Welfare. (2) I and II. Mrs. Taylor, ———
I: Mrs. Taylor; II: ———.
Legal information for social workers; the sources of California laws. The courts of California; fundamentals of law governing domestic relations, neglected and dependent children, delinquents, landlord and tenant, etc.; problems of legal procedure.
- 202A-202B. Social Case Work. (2-2) Yr. Mrs. Deverill, Mrs. Dewees
Introduction to the study and practice of social case work.
203. Community Organization. (2) I and II. Mr. Loeb
A study of the social resources of the community and of methods of organizing these resources for the meeting of human needs.

- 251A-251B. Public Assistance. (2-2) Yr. Miss McKeany
 251A. The problem of relief for the needy; poor law policy and practice; the categorical aids, problems of policy and administration. In 1949-1950 course 251A will be given in the spring semester also.
 *251B. Medical care; work relief programs; youth programs; rural relief and rehabilitation; relations with social insurance and other security measures; the prevention of destitution.
- 252A-252B. Public Welfare Administration. (2-2) Yr. Mrs. Taylor, ———
 252A: Mrs. Taylor; 252B: ———.
 252A. The organizational structure of public welfare services in the United States, on federal, state, and local levels, and problems of reorganization.
 252B. The administrative process within the public welfare agency. Problems of administration.
- 253A-253B. Child Welfare. (2-2) Yr. Mrs. Fredericksen
 253A. The Field of Child Welfare: history and background of child welfare; changing conceptions of children's needs in the light of modern theory; special measures for the care and protection of dependent and neglected children; the organization and functions of public and private services for children. In 1949-1950, course 253A will be given in the spring semester also.
 253B. Child Placing: principles and methods of child placing; adoptions; selection of substitute environments such as foster homes and institutions.
- 254A-254B. Medical Social Work. (2-2) Yr. Miss Cooper
 254A. The social component of illness; social case work in the medical setting.
 254B. The development, organization, and administration of medical social service functions in institutional and extramural settings.
- 255A-255B. The Medical Services. (2-2) Yr. Miss Cooper in charge
 255A. Advanced medical information regarding causes of disease, diagnosis, treatment, and prevention.
 255B. The public medical services. Policies and problems of organization, administration, and services.
- 257A-257B. The Treatment of Delinquency. (2-2) Yr. Mr. Chernin
 257A. Institutional treatment; history and development of penal and correctional institutions for adults and juveniles; theories and programs of treatment; organization and administration of correctional services.
 257B. Noninstitutional treatment, probation, and parole; theory and development of probation, parole, and the indeterminate sentence; the organization and administration of parole and probation services.
- 258A-258B. Advanced Social Case Work. (2-2) Yr. Miss Berman, Miss Duren
 258A. Philosophy of social case work theory and practice, with consideration of treatment problems.
 258B. Continuation of course 258A with greater emphasis on refinement of skill in diagnosis and treatment.
259. Principles and Methods of Supervision in Social Welfare. (2) I and II.
 Mrs. Axelrod, Miss Morgan
 Prerequisite: completion of one year of training in a recognized school of social work, including a case-work or group-work and field-work sequence.
 Educational and psychological principles involved in supervision; the

* Not to be given, 1949-1950.

- purposes, possibilities, and current practices of supervision in social agencies; critical evaluation of supervising case material drawn from present practice.
262. **Psychiatry and Social Work.** (2) I. _____
The diagnosis and treatment of the psychoneuroses, neuroses, psychoses, and mental deficiencies, and their social implications; the various schools of psychiatric thought.
263. **Psychiatric Social Work.** (2) II. Mrs. Axelrod
The practice of psychiatric social work; case work in the psychiatric setting; methods and procedures in handling cases; the organization and administration of psychiatric social work units.
Limited to students specializing in psychiatric social work.
264. **The Mental Hygiene Services.** (2) I. Mrs. Fredericksen
The mental hygiene movement and the basic principles of mental health; the development of specialized services for the mentally ill and deficient; commitment policies and procedures; the organization, functions, and administration of mental institutions and clinics; extramural programs.
265. **Social Welfare Research.** (2) I and II. Mr. McEntire
Prerequisite: Economics 2 or Psychology 5 or equivalent.
Fields and methods of social welfare research; techniques of collecting data; analytical methods.
- 266A-266B. **Emotional Development of Children.** (2-2) Yr. Mr. Jonas, Mrs. Maenchen
266A: Mr. Jonas; 266B: Mrs. Maenchen.
Course 266A is not prerequisite to 266B.
266A. Dynamics of childhood behavior in conflicting situations; the contribution of psychoanalytic theory to social case work with children. In 1949-1950, course 266A will be given in the spring semester also.
266B. Child development and family structure; the dynamics of the relationship between the social and cultural determinants of personality. This course is limited to students specializing in psychiatric social work.
280. **Introduction to Group Work.** (2) I and II. Mr. Hearn, Miss Morgan
The group work process as a basic method in social work; historical development; relationships to social psychology, philosophy, sociology, anthropology, and to other social work specialties.
281. **The Practice of Group Work.** (2) II. Miss Morgan
(Formerly numbered 282.)
Analysis of effective leadership and program development in Group Work.
282. **The Theory of Group Development.** (2) I. Mr. Hearn
(Formerly numbered 281.)
Processes and stages in group growth and development; interaction of groups with cultural environment; function of group worker in group development.
283. **Advanced Seminar in Group Work.** (2) II. Mr. Hearn
Professional, theoretical, and research problems in group work theory and practice. For advanced group work students.
291. **International Social Services.** (2) II. Mr. Friedlander
An examination of the international social agencies and their activities. Comparative analysis of the development and main characteristics of the system of public and private social services in selected foreign countries.
292. **Cultural and Social Aspects of Social Welfare Practice.** (2) I. Mr. Loeb
Prerequisite: open to graduate students in any school or department

whose interest and research is concerned with such problems, and who have permission of the instructor.

Intensive survey of the relationships of diverse social and cultural backgrounds of groups (ethnic, racial, religious, class, caste) in the United States to the problems and practice of professional social work.

293. Seminar on Social Security. (2) I. Mr. Friedlander
Prerequisite: Economics 185 or an equivalent course in social insurance.
Advanced study and research in social security; special emphasis on relationship between the social insurances and social welfare programs.
298. Special Studies. (1-6) I and II. The Staff (Mr. Chernin in charge)
Individual or group study, with emphasis on original research, as may be arranged.
299. Special Research. (2) I and II.
The Staff (Mr. McEntire, Mrs. Tarnopol in charge)
Group research on selected problems in social welfare. Open to candidates for the degree of Master of Social Welfare who have completed course 265 or the equivalent.
401. Field Work. (2-10) I and II. The Staff (Miss McKeany in charge)
Field work in social agencies under supervision, as prescribed and arranged by the staff. The normal program for first-year students is 400 hours of supervised work (two days per week during two semesters), for which 8 units of credit are granted; for less work, proportionately less credit is allowed. For second-year students advanced field practice in specialized types of social work, to be offered two or three days a week during each semester, or to be arranged in periods of continuous work, is normally required. Arrangements of field work vary in extent and credit in accordance with the needs of individual students.
- Conference on Social Welfare (no credit) I and II.
The Staff (Mr. Loeb in charge)
Lectures and discussion by members of the staff and by visitors on current problems in social welfare.

SOCIOLOGY AND SOCIAL INSTITUTIONS

EDWARD STRONG, Ph.D., Professor of Philosophy (Chairman of the Department of Sociology and Social Institutions).

WOLFRAM EBERHARD, Ph.D., Associate Professor of Sociology and Social Institutions.

MARGARET T. HODGEN, Ph.D., Associate Professor of Sociology and Social Institutions.

² ROBERT A. NISBET, Ph.D., Associate Professor of Sociology and Social Institutions.

REINHARD BENDIX, Ph.D., Assistant Professor of Sociology and Social Institutions.

SEYMOUR M. LIPSET, Ph.D., Assistant Professor of Sociology and Social Institutions.

KENNETH E. BOCK, Ph.D., Instructor in Sociology and Social Institutions.

ALBERT PIERCE, Ph.D., Instructor in Sociology and Social Institutions.

Letters and Science List. — All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Bock.

² In residence spring semester only, 1949-1950.

Preparation for the Major.—Required: courses 1, 2, 10A–10B, Economics 2, or Psychology 5. Recommended: Anthropology 2A–2B, Economics 1A–1B, History 4A–4B, Philosophy 20A–20B, Psychology 1A–1B.

The Major.—Required: 24 units in the upper division consisting of 6 units in each of the three groups A, B, and C under I, and 6 units from I and II, as approved by the departmental major adviser. The completion of the major will require the maintenance of a satisfactory grade average.

LOWER DIVISION COURSES

1. Introduction to Sociology. (3) I. Mr. Bendix
Two lectures; one recitation section weekly to be arranged.
Principal concepts and problems, such as culture, personality, association, status, change. Types of social relations in Western and non-Western societies.
2. Social Organization. (3) II. Mr. Nisbet
Two lectures; one recitation section weekly to be arranged.
Social relations and structures. Emphasis will be on recent American society.
Course 1 is not prerequisite to course 2.

SOPHOMORE COURSE

- 10A–10B. Progress and Civilization. (3–3) Yr. Mr. Bock
Prerequisite: course 10A or consent of the instructor.
Historical and critical examination of leading ideas in the social sciences.

UPPER DIVISION COURSES

I

Group A: Method and Theory

- 101A–101B. Theories of Social Change. (3–3) Yr. Miss Hodgen
101A. Critical analysis of geographical, racial, and economic theories of social progress.
101B. Comparison of the procedures of investigation employed in studies of social evolution, in natural history, and history.
 - 105A–105B. Social Research. (3–3) Yr. Mr. Pierce, Mr. Lipset
105A: Mr. Pierce; 105B: Mr. Lipset.
Basic methodological problems: relation of theory to empirical investigation; objectivity, causation, formulation of problems. Techniques of research: interview, case study, participant observation, field study, content analysis. Illustrative analyses of sociological monographs.
 121. Historical Sociology. (3) I. Mr. Bock
(Formerly numbered 121A.)
Exposition and criticism of some major contributions in the field of historical sociology. Emphasis on leading figures such as Comte, Spencer, Spengler, Teggart, Sorokin, Toynebee.
 122. Sociological Theory. (3) II. Mr. Nisbet
(Formerly numbered 121B.)
The emergence of sociology in the nineteenth century; relation of sociology to the other social sciences. Principal problems and concepts.
 125. Contemporary Issues in Social Theory. (3) I. Mr. Bendix
Development of social theory in Germany, especially with regard to the sociology of knowledge. Contributions to sociology by Max Weber, Karl Mannheim, and others will be examined.
- Theory of Historical Inquiry (Philosophy 147). (3) I.

Group B: Historical and Comparative

- The Nature of Culture (Anthropology 118A-118B). (3-3) Yr.
- 131A-131B. History of Social Institutions. (3-3) Yr. Mr. Bock
 Nine hours of laboratory weekly.
 Research in selected fields of institutional history such as family, state, war, technology, art, music, religion; preceded by critical examination of representative works in the subject chosen.
- 141A*-141B. History of Western Social Organization. (3-3) Yr. Mr. Nisbet
 (Formerly numbered 141.)
 An analysis of the changing position of the family and community in Western society; effects of war, industrialism, and nationalism upon these groups; background of contemporary problems.
- 142A-142B. Comparative Institutions. (3-3) Yr. Mr. Eberhard
 (Formerly numbered 142.)
 Comparative treatment of social and political institutions in selected areas; relation of ideas to institutions; the state and social groups; emphasis on the problem of superstratification.
144. Migration. (3) II. Mr. Pierce
 Examination of empirical data on spatial shifts of population; historical comparisons; special attention to the Pacific region; analysis of factors in migration, and critique of generalizations.
- 151A-151B. The History of Civilization. (3-3) Yr. Miss Hodgen
 Nine hours of laboratory weekly.
 A study of historical changes in the civilization of selected areas.
160. The City. (3) I. Mr. Lipset
 Social structure of the urban community. Comparative materials from earlier historical periods and from contemporary societies will be used. Emphasis on the effects of urbanization upon various social institutions.
- 166A-166B. Oriental Societies. (3-3) Yr. Mr. Eberhard
 166A. Main characteristics of Asiatic agricultural societies (China, Japan, India). Differences from Western cultures. Research methods. Emphasis on the medieval periods.
 166B. Main characteristics of Asiatic nomadic societies (Central Asia, Turks, Mongols, Middle East). Their contacts with nonnomadic cultures.
 Course 166A is not prerequisite to 166B.

Group C: Social Processes and Relations

- *102. Social Problems of Large-Scale Organizations. (3) II. Mr. Bendix
 The growth of large-scale organizations in business and government; social and psychological factors affecting human relations.
- The Professions and Modern Society (Education 108). (2) II.
- *132. Social Stratification. (3) I.
 Analysis of recent occupational trends and of social problems of occupational stratification; social classes in local communities and the nation as related to interest organizations.
133. Population. (3) I. Mr. Pierce
 Quantitative and qualitative study of populations throughout the world, dynamics of population, methods of analysis, and sources of information. Special emphasis on the articulation of population study with sociology.
134. Population Characteristics in North America. (3) II. Mr. Pierce
 Study of population phenomena in the United States, Canada, and Mexico. Emphasis will be on the Pacific region.

* Not to be given, 1949-1950.

- 137A-137B. Regional Sociology of the United States. (3-3) Yr. Mr. Pierce
Development of concept of "region." Analysis of the United States on
a regional basis. Contemporary social and economic regional problems. Spe-
cial attention will be given to the Pacific Coast area.
- Social Psychology (Psychology 145). (3) I and II.
148. Problems in the Study of Group Behavior. (3) II. Mr. Bendix
Modern theories of group behavior examined in the light of empirical
studies dealing with the interrelation of personality and culture.
- Living Races of Man (Anthropology 153). (3) I.
161. Community and Modern Industry. (3) II. Mr. Lipset
Institutional and ideological setting of industry; effects of size and
composition of the community on industry and trade unions; social group-
ings in the community and the factory.
- ◇
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Mr. Bock in charge)

II

RECOMMENDED COURSES IN OTHER DEPARTMENTS

Group A: Method and Theory

- Economic Theory (Economics 100A-100B). (3-3) Yr.
Ethics (Philosophy 104). (3) I.
Social Philosophy (Philosophy 108). (3) II.
Political Philosophy (Philosophy 128). (3) II.
Principles of Politics (Political Science 112A-112B). (3-3) Yr.
Elements of Jurisprudence (Political Science 117). (3) I.

Group B: Historical and Comparative

- History of Economic Doctrine (Economics 101A-101B). (3-3) Yr.
Social Reform Movements (Economics 106). (3) I and II.
Economic History Since 1850 (Economics 110). (3) I and II.
Contemporary Civilization (Anthropology 160). (3) II.
Social History of the United States (History 176A-176B). (3-3) Yr.

Group C: Social Processes and Relations

- Rural Sociology (Agricultural Economics 112A-112B). (2-2) Yr.
Population and Migration (Economics 188A-188B). (3-3) Yr.
Crime and Delinquency (Social Welfare 101A-101B). (2-2) Yr.
Social Problems of Families (Home Economics 142). (3) II.
Problems of Poverty (Economics 180). (3) I and II.
Public Opinion (Political Science 114). (3) I.
Personality (Psychology 148A). (3) II.
Personality in Society and Culture (Psychology 141). (3) I.

GRADUATE COURSES

202. Seminar in Social Problems of Large-Scale Organization. (2) II.
(Formerly numbered 202A-202B.) Mr. Bendix
203. Seminar in Contemporary Social Theory. (2) I. Mr. Bendix
210. Seminar in Historical Sociology. (2) II. Mr. Bock
Problems and procedures in the sociological treatment of temporal
social phenomena.

- *215A-215B. Interdepartmental Seminar. (2-2) Yr. The Staff
 221A-221B. Seminar in Social and Historical Processes. (2-2) Yr.
 Miss Hodgen
 235A-235B. Seminar in Non-European Cultural Stratification. (3-3) Yr.
 Mr. Eberhard
 Social, economic, and political relations between Central Asiatic cultures and Chinese or Middle Eastern cultures; relations between Chinese and Indo-Chinese cultures. Colonization.
- *241A-241B. Seminar in Social Organization. (2-2) Yr. Mr. Nisbet
 Studies in the relationships of social groups to modern political and economic institutions.
260. Seminar in Political and Industrial Sociology. (2) I. Mr. Lipset
 Contributions of sociology to theory and research in politics and industrial relations. Analysis of structure and ideology of organized groups.
- *Seminar in Theories of History (Philosophy 247). (2) II. _____
299. Individual Study and Research. (3-6) I and II.
 The Staff (Mr. Bendix in charge)

SPANISH AND PORTUGUESE

ERASMO BUCETA, Doctor en Derecho, Professor of Spanish.

¹ CHARLES E. KANY, Ph.D., Professor of Spanish.

JOSÉ F. MONTESINOS, Licenciado en Filosofía y Letras, Professor of Spanish.

² LESLEY B. SIMPSON, Ph.D., Professor of Spanish (Chairman of the Department, spring semester).

ROBERT K. SPAULDING, Ph.D., Professor of Spanish (Acting Chairman of the Department, fall semester).

ARTURO TORRES-RIOSECO, Ph.D., Professor of Latin-American Literature.

S. GRISWOLD MORLEY, Ph.D., Litt.D., Professor of Spanish, Emeritus.

BEATRICE Q. CORNISH, Ph.D., Assistant Professor of Spanish, Emeritus.

YAKOV MALKIEL, Ph.D., Associate Professor of Romance Philology.

EDWIN S. MORBY, Ph.D., Associate Professor of Spanish.

FERNANDO A. ALEGRIA, Ph.D., Assistant Professor of Spanish.

G. ARNOLD CHAPMAN, Ph.D., Assistant Professor of Spanish.

DOROTHY C. SHADI, Ph.D., Assistant Professor of Spanish.

EDWIN J. WEBBER, Ph.D., Instructor in Spanish.

BENJAMIN M. WOODBRIDGE, JR., Ph.D., Instructor in Portuguese.

MARIAN FREDINE, M.A., Associate in Spanish.

MADRE MERRILL, M.A., Associate in Spanish.

Letters and Science List.—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Advisers.—For Plan A, Mr. SPAULDING; for Plan B, Mr. TORRES-RIOSECO.

Preparation for the Majors.—Majors in Plan A and Plan B (described below) have a common preparation, namely: four years of high school Spanish, or courses 1, 2, and 3 (if course 3 is passed with a grade of at least B; otherwise include course 4); course 25A-25B or 25 (with a grade of at least B);

* Not to be given, 1949-1950.

¹ In residence fall semester only, 1949-1950.

² In residence spring semester only, 1949-1950.

two years of high school Latin, or Latin 1 and 2 (to be completed before entering upon the senior year).

Students transferring from other institutions with advanced standing and intending to major in the department must present evidence (by examination or otherwise) that their preparation includes the equivalent of Spanish 25.

The Majors.—Two majors are offered in the department: Plan A, the Literature and Language of Spain; Plan B, The Literature and Language of Latin America.

Requirements for Plan A: 24 units of upper division work in the department, including courses 107A–107B (6 units) and 112A–112B (4 units). The remaining units may be completed from courses 100, 103A–103B, 105, 109, 110, 111, and 115. Recommended electives: further study in French, Italian, Portuguese, and Latin, and History 160A–160B.

Requirements for Plan B: 24 units of upper division work in the department, including courses 104A–104B (6 units), 107A–107B (6 units), 113A–113B (4 units), 114A–114B (4 units). The remaining units may be completed from Portuguese 123, Spanish 102, 105, 110, 111, 112A–112B, and 115. Recommended electives: Spanish 103A–103B; History 161A–161B; French 112A–112B, French 121A–121B.

Students who fail to maintain at least an average grade of C in the Spanish courses taken in the upper division will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major.

The requirements for Plan A and Plan B (including preparation) apply to all students entering the upper division in September, 1948, and thereafter.

Honor Students in the Upper Division.—Candidates for honors must do distinguished work (B average or better) in their major programs.

Higher Degree.—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

SPANISH

LOWER DIVISION COURSES

Students whose native tongue is Spanish or Portuguese will not normally be admitted into any lower division courses in their respective languages except Spanish 25A–25B or 25, or Portuguese 25.

1. Elementary Spanish. (4) I and II. Miss Fredine in charge
Sections meet five hours weekly.
2. Elementary Spanish (continuation of 1). (4) I and II.
Sections meet five hours weekly. Mr. Webber in charge
Prerequisite: course 1 or two years of high school Spanish, or the equivalent.
3. Intermediate Spanish (continuation of 2). (4) I and II.
Sections meet five hours weekly. Mrs. Shadi in charge
Prerequisite: course 2 or three years of high school Spanish, or the equivalent.
4. Intermediate Spanish (continuation of 3). (4) I and II.
Sections meet five hours weekly. Mrs. Shadi in charge
Prerequisite: course 3 or four years of high school Spanish, or the equivalent.

25A–25B. Advanced Spanish. (3–3) Yr. Beginning each semester.

Mr. Alegria, Mr. Chapman, Mr. Morby, Mrs. Shadi,
Mr. Spaulding, Mr. Webber

Required as preparation for the major.

Prerequisite: four years of high school Spanish, or course 3 (with a grade of at least B) or 4, or the equivalent.

25. Advanced Spanish. (5) II. Mr. Morby
 Prerequisite: same as for 25A.
 Alternative course to 25A-25B, designed for students entering in mid-year who wish to prepare themselves for entering the upper division the following fall.

UPPER DIVISION COURSES

100. Introduction to Spanish Linguistics. (2) I. Mr. Kany
 (Formerly numbered 100A.)
102. American-Spanish Divergencies from Standard Castilian. (2) I. Mr. Kany
 (Formerly numbered 100B.)
- 103A. History of Spanish Literature (1680-1900). (3) I. Mr. Montesinos
 103B. Study of a Prose Genre of the Nineteenth Century. (3) II. Mr. Montesinos
- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester. Mr. Torres-Rioseco, Mr. Chapman
 Required of majors in Plan B.
105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I. Mrs. Shadi
 (Formerly numbered 105A-105B.)
- 107A-107B. History of Spanish Literature to 1680. (3-3) Yr. Mr. Buceta, Mr. Morby
 Prerequisite: senior standing.
 Required of majors in Plan A and Plan B.
- 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
- 110A-110B. Twentieth-Century Peninsular Prose. (2-2) Yr. Mr. Buceta
- 111A-111B. Cervantes. (2-2) Yr. Mr. Morby, Mr. Simpson
 111A. Mr. Morby; 111B. Mr. Simpson.
- 112A-112B. A Survey of Spanish Culture. (2-2) Yr. Mr. Malkiel, Mr. Montesinos
 112A. Mr. Malkiel; 112B. Mr. Montesinos.
 Required of majors in Plan A.
- 113A-113B. A Survey of Latin-American Culture. (2-2) Yr. Mr. Torres-Rioseco
 Required of majors in Plan B.
- 114A-114B. The Contemporary Spanish-American Novel. (2-2) Yr. Mr. Alegria
 Required of majors in Plan B.
115. A Survey of Spanish Lyric Poetry. (3) II. Mrs. Shadi
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. Spaulding
 Required only of candidates for the Certificate of Completion, teacher-training curriculum.
199. Special Study for Advanced Undergraduates. (1-3) I and II. Mr. Spaulding in charge

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 163)

- In the requirements for the master's degree this department follows Plan II.
- 201A-201B. History of the Spanish Lyric. (2-2) Yr. Mr. Buceta
- *202A-202B. History of the Spanish Novel to the End of the Seventeenth Century. (2-2) Yr. Mr. Buceta
- *204A-204B. La novela hispanoamericana. (2-2) Yr. Mr. Torres-Rioseco
- *206. Problems in American Spanish. (2) II. Mr. Kany
- *208A-208B. The Ballad. (2-2) Yr.

* Not to be given, 1949-1950.

- *209A-209B. The Drama of the Golden Age. (2-2) Yr.
An intensive study of one author.
- 212A-212B. Old Spanish. (2-2) Yr. Mr. Spaulding
Reading and historical grammar. Required for candidates for the master's degree.
- *213A-213B. The Spanish Novel in the Nineteenth Century. (2-2) Yr.
Mr. Montesinos
- 214A-214B. Modernism in Hispano-America. (2-2) Yr. Mr. Torres-Rioseco
- 215A-215B. Moralists and Satirists of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
216. Spanish Versification. (1) II. Mrs. Shadi
- *218A-218B. Seminar in Spanish Diplomatic Paleography of the Sixteenth Century. (2-2) Yr. Mr. Simpson
225. Pronunciation. (2) I. Mr. Kany
299. Special Advanced Study. (1-4) I and II. Mr. Spaulding in charge
Open to qualified students who wish to take special advanced work.

PORTUGUESE

LOWER DIVISION COURSES

1. Elementary Portuguese. (4) I and II. Mr. Woodbridge in charge
Sections meet five hours weekly.
2. Elementary Portuguese. (4) I and II. Mr. Woodbridge in charge
Sections meet five hours weekly.
Prerequisite: course 1 or oral command of the language.
25. Advanced Portuguese. (3) I. Mr. Woodbridge
Reading and composition.
Prerequisite: courses 1 and 2 or the equivalent, or consent of the instructor.

UPPER DIVISION COURSES

121. Readings in Portuguese. (3) I and II. Mr. Woodbridge
Prerequisite: junior standing and a satisfactory reading knowledge of Latin or one Romance language, or consent of the instructor.
Course 121 or the equivalent is prerequisite to courses 122, 123, 131, 199, 201, and 299.
- *122. Portuguese Literature. (3) II. Mr. Malkiel
Survey of the literature of Portugal, with emphasis on the sixteenth and nineteenth centuries.
123. Brazilian Literature. (3) I and II. Mr. Woodbridge
Survey of the literature of Brazil, with emphasis on the nineteenth and twentieth centuries.
131. Advanced Portuguese Composition and Conversation. (3) II. Mr. Woodbridge
199. Special Study for Advanced Undergraduates. (1-3) I and II. Mr. Woodbridge

GRADUATE COURSES

- *201. The Brazilian Novel. (2) II. Mr. Woodbridge
299. Special Advanced Study. (1-4) I and II. Mr. Malkiel in charge

* Not to be given, 1949-1950.

SPEECH

- GERALD E. MARSH, M.A., Professor of Speech (Chairman of the Department).
 ALAN R. THOMPSON, Ph.D., Professor of Speech and Dramatic Literature.
 DWIGHT E. WATKINS, M.A., Associate Professor of Speech, Emeritus.
 †C. DOUGLAS CHRÉTIEU, Ph.D., Associate Professor of Speech.
 ARNOLD PERSTEIN, Ph.M., Associate Professor of Speech.
 EDWARD Z. ROWELL, Ph.D., Associate Professor of Speech.
 DAVID RYNIN, Ph.D., Associate Professor of Speech.
 JACOBUS TEN BROEK, J.S.D., Associate Professor of Speech.
 *EDWARD N. BARNHART, Ph.D., Assistant Professor of Speech and Lecturer in Psychology.
 WOODROW W. BORAH, Ph.D., Assistant Professor of Speech.
 WILLIAM B. HOLTHER, Ph.D., Assistant Professor of Speech.
 ISABEL HUNGERLAND, Ph.D., Assistant Professor of Speech.
 AURORA M. QUIROS, M.A., Assistant Professor of Speech.
 JOSEPH TUSSMAN, Ph.D., Assistant Professor of Speech.
 GARFF B. WILSON, Ph.D., Assistant Professor of Speech.
 WILLIAM FEARNside, LL.B., Ph.D., Instructor in Speech.



- ROBERT L. BELOOF, M.A., Lecturer in Speech.
 MARGARET BLACKBURN, M.A., Lecturer in Speech.
 RICHARD HAGOPIAN, M.S., Lecturer in Speech.
 REBECCA HAYDEN, M.A., Lecturer in Speech.
 SINCLAIR KEEBY-MILLER, Ph.D., Lecturer in Speech.
 *WILLIAM B. McCOARD, Ph.D., Lecturer in Speech.
 ANTHONY OSTROFF, M.A., Lecturer in Speech.
 ELIZABETH RUSSELL, Ph.D., Lecturer in Speech.
 WILLIAM SHEPARD, M.A., Lecturer in Speech.
 FRED STRIPP, M.A., Th.D., Lecturer in Speech.
 ANGELA SULLIVAN, M.A., Lecturer in Speech.
 WARD E. TABLER, A.B., Lecturer in Speech.
 HYPATIA N. TEAGUE, A.B., Lecturer in Speech.
 WALTER UTT, M.A., Lecturer in Speech.
 MARJORIE WALSH, M.A., Lecturer in Speech.
 RICHARD B. WILSON, M.A., Lecturer in Speech.

Students must have passed Subject A before taking any course in speech.

The courses in speech fall into two well-defined groups:

(a) *Oral Expression*. In this group come such courses as those in voice culture and oral interpretation of literature.

(b) *Logical Discourse—Expository and Argumentative*. Under this heading are grouped the courses covering the logical and rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect speech for their major study are required to so arrange their courses as to cover the fundamentals in both phases of the work before taking advanced studies in their special field. It is hoped that by a combination of both kinds of work a foundation may be laid which will prove

† Sabbatical leave in residence, 1949-1950.

* Absent on leave, 1949-1950.

valuable not only to teachers of oral English in the high school but also to all those who are preparing for professional careers in which the clear and orderly presentation of thought, orally, plays an important part.

Letters and Science List.—All undergraduate courses in speech are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Rowell.

Preparation for the Major.—Students who wish to make speech their major subject must have completed, with an average grade of C or better, courses 1A-1B and 2A-2B. It is recommended that Philosophy 6A-6B be taken concurrently with course 1A-1B.

The Major.—Required: 24 units in upper division courses which must include 107A-107B, 110A-110B, and 111A-111B. Course 107A-107B should be taken in the junior year. Six of the 24 units required for the major may, with the approval of the departmental representative, be chosen from the following courses in English: 153A-153B, 114A-114B, 116, 117E, and 110; or the following courses in Philosophy: 104, 108, 112, 125, 128, 136A-136B, and 146.

Honors.—Candidates for honors at graduation must have completed the major with an average grade not lower than B.

LOWER DIVISION COURSES

1A-1B. Elements of Speech. (3-3) Yr. Beginning each semester.

Mr. Borah, Mr. Chrétien, Mr. Fearnside, Mr. Holther, Mr. Kerby-Miller, Mr. Marsh, Mr. Perstein, Mr. Rowell, Mr. Rynin, Mr. Shepard, Mr. Stripp, Mr. ten Broek, Mr. Tabler, Mr. Thompson, Mr. Tussman, Mr. Utt, Mr. R. B. Wilson

A forum of organized student discussion and speeches based on an intensive study of selected essays chosen from the writings of representative English and American authors; training in the principles of oral rhetoric, in summarizing and outlining, in the use of the library, and in the presentation from the platform of prepared speeches.

In each semester Mr. ten Broek's section of 1A and 1B is primarily for prelegal students.

2A-2B. The Fundamentals of Oral Interpretation of Literature. (3-3) Yr. Beginning each semester.

Mr. Belooof, Miss Blackburn, Mr. Hagopian, Miss Hayden, Mrs. Hungerland, Mr. Ostroff, Miss Quiros, Mrs. Russell, Mrs. Sullivan, Mrs. Teague, Miss Walsh, Mr. G. B. Wilson

Introduction to the oral reading of prose and poetry; practice in speaking and reading with training in the principles for effective delivery.

10. Logic of Argument. (3) I and II.

Mr. Rynin

An introduction to the problems of evidence and inference with emphasis on the application of logic to rational discussion of social problems.

12. Psychology of Argument. (3) I.

Mr. Kerby-Miller

Primarily concerned with the function of communication in inducing belief and directing behavior; an introductory study of techniques used in political propaganda and other forms of persuasion.

25. Oral English for Foreign Students. (4) I and II.

Miss Hayden

For foreign students only. Pronunciation, speaking, grammar, reading, and writing of English. Required for those who fail to pass the Examination in English and who are not qualified to take course 26.

26. Oral English for Foreign Students. (4) I and II.

Miss Hayden

Continuation of and required for those who take course 25.

40. Advanced Oral English for Foreign Students. (3) I and II. Mrs. Russell
Prerequisite: course 26 or consent of the instructor.

Practice in précis writing of advanced material, designed to improve the student's ability to grasp and restate meaning of material and to plan and present formal speeches.

UPPER DIVISION COURSES

- *103. English Phonetics. (3) II. Mr. Chrétien
Lectures on physical, anatomical, and physiological background of speech. Detailed study of American English speech sounds. Construction of phonemic patterns. Standards of pronunciation. American dialects.
106. The Oral Reading of Poetry and Prose. (3) I and II. Mr. G. B. Wilson
Prerequisite: primarily for candidates for teaching credentials whose major is English; others admitted by special permission of the instructor. Not open to students who have taken course 2A or 2B.
The study of poetry and prose from the point of view of oral interpretation. The principles of effective oral reading of literature; much practice in platform reading.
- 107A-107B. Argumentative Discourse: Oral and Written. (3-3) Yr. Beginning each semester. Mr. Borah, Mr. Kerby-Miller, Mr. Rowell, Mr. Tussman, Mr. Holther, Mr. Fearnside
Prerequisite: course 1A-1B.
- 110A-110B. Oral Argumentation and Debate. (3-3) Yr. Mr. Marsh, Mr. Perstein
Prerequisite: courses 1A-1B, 2A-2B, and 107A-107B.
- 111A-111B. The Reading of Prose and Poetry. (3-3) Yr. Miss Blackburn, Mrs. Hungerland, Miss Quiros, Mr. G. B. Wilson
Prerequisite: course 2A-2B.
111A: The essay and the short story. 111B: The ballad, the lyric, the ode, etc.
- 117A-117B. Semantics. (3-3) Yr. Mr. Rynin
An examination of the nature and functions of language with special emphasis on the problems of meaning.
117A: The language of science. 117B: The language of values.
118. Symbolism: A Study of the Expressive Functioning of Signs. (3) II. Mrs. Hungerland
Prerequisite: course 12 or consent of the instructor.
The nature of symbols, with special emphasis on their function in poetry.
119. Analysis of Communication Content. (3) II. Mr. Holther
Introduction to research techniques in communication with special emphasis on content analysis and audience response; individual and group research projects will be carried out by students under supervision.
- *120. The Use of the Library. (3) II. Mr. Barnhart
Open to sophomores.
Practical exercises in the use of the research facilities of the library, student projects centering around propaganda techniques, symbols, and campaigns in European history since the French Revolution.
132. Classical Rhetoric. (3) II. Mr. Holther
A study of rhetoric based on the writings of Plato, Aristotle, and other writers, with reference to criticism, aesthetic theory, and speech in the Classical era.
- *135. British Public Address During the Eighteenth and Nineteenth Centuries. (3) II. Mr. ten Broek
Critical analysis of speeches of Burke, Pitt, Peel, Cobden, Bright, Glad-

* Not to be given, 1949-1950.

- stone, Disraeli, Newman, Huxley, Mill, and others. Attention given to issues with which they were identified and their relationship to the social movements of their time.
137. American Public Address During the Eighteenth and Nineteenth Centuries. (3) I. Mr. ten Broek
Critical analysis of speeches of Randolph, Williams, Franklin, Washington, Hamilton, Marshall, Calhoun, Webster, Emerson, Lincoln, Douglas, and others.
138. Modern Public Address. (3) II. Mr. ten Broek
Critical analysis of speeches of Wilson, Roosevelt, Churchill, and other leaders from 1914 to the present time.
139. Modern Spokesmen. (3) I. Mr. Tussman
An examination of the writings and speeches of leading spokesmen for major contemporary movements—political, social, and religious—with special reference to problems of ideology and ideological conflict, objectivity and evaluation, and the rationalization of conflict.
152. Debate. (2) I and II. Mr. ten Broek, Mr. R. B. Wilson
Designed for those who wish to participate in intercollegiate debate. It may be repeated for a maximum of 6 units. Students wishing to take this course and 107A-107B may enroll in the latter only with the permission of the instructor and in any combination of the two courses may not receive more than 8 units.
198. Directed Group Studies for Upper Division Students. (1-5) I and II.
The Staff (Mr. Marsh in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Marsh in charge)

SUBJECT A: ENGLISH COMPOSITION

EDWIN S. MORBY, Ph.D., Associate Professor of Spanish.

PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.

R. BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.



PHIL S. GRANT, M.A., Supervisor of Instruction in Subject A.

Subject A. (No credit) I and II.

Mr. Grant and Assistants

Three hours weekly.

Required of all students who do not pass the examination in Subject A. Fee, \$20. To those students who maintain an average grade of A during the first seven weeks of the semester half of the fee will be refunded, and they may discontinue attending the course. For the regulations governing this requirement, see page 38.

Training in correct writing, including drill in sentence and paragraph construction, diction, punctuation, grammar, and spelling. Weekly compositions and written tests on the text. The principles of English composition are presented, and typical student compositions are analyzed and discussed in sections limited to thirty students.

VETERINARY SCIENCE†

J. RAYMOND BEACH, D.V.M., Professor of Veterinary Science.

GEORGE H. HART, M.D., D.V.M., Professor of Veterinary Medicine, Davis
(Chairman of the Department).

OSCAR W. SCHALM, D.V.M., Ph.D., Professor of Veterinary Science.

JACOB TRAUM, D.V.M., Professor of Veterinary Science.

WILLIAM H. BOYNTON, D.V.M., Professor of Veterinary Science, Emeritus.

CLARENCE M. HARING, D.V.M., Professor of Veterinary Science, Emeritus.

KENNETH B. DEOME, Ph.D., Associate Professor of Animal Pathology.

RAYMOND A. BANKOWSKI, D.V.M., Ph.D., Assistant Professor of Veterinary
Science.

UPPER DIVISION COURSES

- *101. Poultry Hygiene. (3) II. Mr. Beach, Mr. Bankowski, Mr. DeOme
Lecture and laboratory. Given each fourth semester.
Prerequisite: Bacteriology 1 (may be taken concurrently) or Bacteri-
ology 1 (Davis); Physiology 1 and 1L or Animal Husbandry 110 (Davis).
A study of the principles of pathology and measures for the mainte-
nance of health of poultry.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Bankowski, Mr. Beach, Mr. DeOme, Mr. Schalm, Mr. Traum
Prerequisite: courses basic to the problem elected and consent of the
instructor.

GRADUATE COURSE

- 200A-200B. Research in Animal Pathology. (1-6; 1-6) Yr.
Mr. Bankowski, Mr. Beach, Mr. DeOme, Mr. Schalm, Mr. Traum
Research in poultry diseases may be elected in above courses.

ZOOLOGY

RICHARD M. EAKIN, Ph.D., Professor of Zoölogy.

HAROLD KIRBY, Ph.D., Professor of Zoölogy (Chairman of the Department).

ALDEN H. MILLER, Ph.D., Professor of Zoölogy and Director of the California
Museum of Vertebrate Zoölogy.

PAUL R. NEEDHAM, Ph.D., Professor of Zoölogy.

CURT STERN, Ph.D., Professor of Zoölogy.

RICHARD GOLDSCHMIDT, Ph.D., M.D., Sc.D., Professor of Zoölogy, Emeritus.

SAMUEL J. HOLMES, Ph.D., LL.D., Professor of Zoölogy, Emeritus.

JOSEPH A. LONG, Ph.D., Professor of Embryology in the Institute of Experi-
mental Biology, Emeritus.

SETH B. BENSON, Ph.D., Associate Professor of Zoölogy and Curator of
Mammals, California Museum of Vertebrate Zoölogy.

J. E. GULLBERG, A.B., Associate Professor of Metrology.

WILLIAM E. BERG, Ph.D., Assistant Professor of Zoölogy.

† Information concerning the School of Veterinary Medicine is contained in the ANNOUNCEMENT OF THE SCHOOL OF VETERINARY MEDICINE and the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, which is available without charge from the College of Agriculture, University of California, Berkeley 4, California. Specific questions should be directed to the Dean, School of Veterinary Medicine, College of Agriculture, University of California, Davis, California. See also the Preveterinary Science curriculum in the College of Agriculture, page 94 of this bulletin.

* Not to be given, 1949-1950.

MORGAN HARRIS, Ph.D., Assistant Professor of Zoölogy.

A. STARKER LEOPOLD, Ph.D., Assistant Professor of Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy.

OLIVER P. PEARSON, Ph.D., Assistant Professor of Zoölogy and Assistant Curator of Mammals, California Museum of Vertebrate Zoölogy.

¹ FRANK A. PITELKA, Ph.D., Assistant Professor of Zoölogy and Curator of Birds, California Museum of Vertebrate Zoölogy.

RALPH I. SMITH, Ph.D., Assistant Professor of Zoölogy.

¹ ROBERT C. STEBBINS, Ph.D., Assistant Professor of Zoölogy and Curator in Herpetology, California Museum of Vertebrate Zoölogy.

HOWARD A. BERN, Ph.D., Instructor in Zoölogy.

PAUL H. BALDWIN, M.S., Associate in Zoölogy for the spring semester.

PHYLLIS B. KUTSKY, A.B., Associate in Zoölogy for the fall semester.

GEORGE W. SALT, M.A., Associate in Zoölogy for the spring semester.

ROBERT SAMUELS, M.A., Associate in Zoölogy.

ELIZABETH SCOTT, M.A., Associate in Parasitology for the spring semester.

MARIETTA VOGEL, M.A., Associate in Zoölogy for the fall semester.



FRANCES M. WEESNER, M.A., Lecturer in Zoölogy.

Letters and Science List.—All undergraduate courses in Zoölogy except courses 109 and 145 are included in the Letters and Science List of Courses. For regulations governing this list, see page 85.

Departmental Major Adviser: Mr. Harris.

Preparation for the Major.—Required: courses 1A, 1B, Chemistry 1A, and either Chemistry 1B or 8. Recommended: German, French, and elementary courses in other biological and physical sciences.

The Major.—Required: (1) 24 units of upper division courses in Zoölogy. (a) For 6 of these units substitutions may be made from upper division courses in bacteriology, biochemistry, botany, organic chemistry, entomology, genetics, microscopic anatomy, paleontology, physiology, physical chemistry and physics. (b) Honor students whose major is zoölogy may be permitted a broader selection of related courses, and may under special circumstances make substitution for more than 6 units. (2) At least a 1.5 average in upper division courses included in the major.

LOWER DIVISION COURSES

- 1A. General Zoölogy. (4) I and II. Mr. Harris, Mr. Samuels, ———
 I: Mr. Harris, Mr. Samuels; II: Mr. Samuels, ———.
 Lectures and laboratory.
 Prerequisite: Chemistry 1A.
 An introduction to the principles of biology with special reference to structure, physiology, heredity, and evolution of animals.
- 1B. General Zoölogy. (4) II. Mr. Bern, Mr. Salt
 Lectures and laboratory.
 Prerequisite: course 1A.
 An introduction to vertebrate zoölogy. Structure, function, development, and history of the vertebrate body.
4. Microscopic Technique. (2) I and II. Miss Weesner
 Laboratory.
 Prerequisite: course 1A and elementary chemistry.

¹ In residence fall semester only, 1949–1950.

10. General Biology. (3) I and II. Mr. Berg, ———
 I: Mr. Berg; II: ———.
 Lectures and demonstrations.
 An outline of the main facts and principles of biology with special reference to the bearing of biology upon human life. Open without prerequisite to all students, but designed for those not specializing in zoölogy. Not open for credit to students who have had course 1A, but students who have taken course 10 may elect course 1A for credit.

UPPER DIVISION COURSES

100. Vertebrate Embryology. (4) I. Mr. Eakin, Mrs. Kutsky
 Lectures and laboratory.
 Prerequisite: course 1B.
 Details of development of the vertebrate body with emphasis in lectures on human embryology, and in laboratory on that of the chick and pig.
- *101. Introduction to Physicochemical Biology. (2) I. ———
 Prerequisite: elementary zoölogy, botany, chemistry, and physics.
 The application of physical and chemical methods to the study of the nature of protoplasm, diffusion processes, absorption, accumulation, and bioelectric phenomena.
- *101C. Physicochemical Biology Laboratory. (2) I. ———
 Prerequisite: course 101 (may be taken concurrently).
- *102. Introduction to Physicochemical Biology. (2) II. ———
 Prerequisite: course 101.
 A continuation of course 101, applied to reactions, enzymes, oxidation, growth, and the effects of salts, temperature, and radiation.
- *102C. Physicochemical Biology Laboratory. (2) II. ———
 Prerequisite: courses 101, 101C, and 102 (may be taken concurrently).
103. Experimental Embryology. (2) II. Mr. Eakin
 Prerequisite: course 1B.
 A study of the production of body form and the induction, differentiation, and growth of primary organ systems.
- 103C. Experimental Embryology Laboratory. (2) II. Mr. Eakin, Mr. Berg
 Prerequisite: course 100 or 103, and 123. (103 and 123 may be taken concurrently with 103C.)
 Descriptive and experimental embryology of the invertebrates; studies of determination, differentiation, and regulation in the vertebrate embryo. Enrollment limited to ten students.
105. Growth and Form. (2) II. Mr. Harris
 Prerequisite: course 1B. Recommended: Chemistry 8.
 The mechanics and regulation of body growth; repair, ageing, and abnormal growth of adult tissues as studied in regeneration, transplantation, and tissue culture.
106. Comparative Anatomy of the Vertebrates. (4) II. Mr. Harris, Mr. Baldwin
 Lectures and laboratory.
 Prerequisite: course 1B. Recommended: course 100.
 Evolution of organ systems and phylogeny of the major vertebrate groups.
107. Cytology. (2) I. Mr. Goldschmidt
 Prerequisite: elementary zoölogy or botany.
 The structure and activities of the cell, especially in development, in sex determination, and in heredity.

* Not to be given, 1949-1950.

- 107C. Cytology Laboratory. (2) I. Mr. Goldschmidt
Prerequisite: course 107 (may be taken concurrently).
109. Biological Examination of Water. (1) II. Mr. Kirby
Microorganisms, other than bacteria, in relation to water supplies.
Restricted to students in sanitary engineering.
- *110. Biology of the Protozoa. (4) I. Mr. Kirby
Lectures and laboratory.
Prerequisite: course 1A and upper division standing. Recommended:
course 119A, Botany 1A.
Study of free-living and symbiotic lower organisms included in this
division of living things, with regard to morphology, physiology, develop-
ment, and biological significance other than applied vertebrate parasitology.
Laboratory work, including microscopy, cytological technique, culture tech-
nique, and study of living and prepared material.
111. General Animal Parasitology. (4) I. Mr. Kirby, Mrs. Voge
Lectures and laboratory.
Prerequisite: course 1A and upper division standing.
Characteristics, life histories, and host relationships of animal parasites
in general, an extended study of helminths, and an account of other para-
sites excepting higher arthropods.
112. Invertebrate Zoölogy. (4) II. Mr. Smith
Lectures, laboratory, and field work.
Prerequisite: course 1A.
Anatomy, classification, and natural history of common invertebrate
animals.
Given also at the seashore in the first summer session.
113. Natural History of the Vertebrates. (4) II.
Mr. Miller, Mr. Benson, Mr. Pearson
Lectures, field trips, and laboratory.
Prerequisite: course 1B.
The birds, mammals, reptiles, and amphibians, chiefly of California;
identification of species; observational methods in study of behavior and
habitat relations; systematics. Field work emphasized.
114. Genetics. (3) I. Mr. Stern
Prerequisite: course 1A, Botany 1A, or course 10, and upper division
standing.
The facts of heredity, basic and advanced.
- 114C. Genetics Laboratory. (1) I. Mr. Stern
Prerequisite: course 114 (may be taken concurrently).
Limited to twenty-four students.
115. Human Genetics. (3) II. Mr. Stern
Prerequisite: course 1A, Botany 1A, or course 10, and upper division
standing.
A study of the principles of inheritance as applied to the physical and
mental characteristics of man, of the heredity-environment problem, and
of the genetic constitutions of populations.
116. Introduction to Wildlife and Fisheries Management. (4) I.
Lectures and laboratory. Mr. Leopold, Mr. Needham
Prerequisite: course 1A or 10 and upper division standing.
Theory and practice of wildlife and fisheries management; identifica-
tion, distribution, and life histories of important species.
- *117. History of Biology. (2) II. _____

118. Comparative Endocrinology. (3) I. Mr. Bern
Prerequisite: course 1B and Chemistry 8.
Lectures on the biology of hormonal mechanisms, with reference to the invertebrates and lower vertebrates, as well as mammals.
- 118C. Comparative Endocrinology Laboratory. (1) I. Mr. Bern
Prerequisite: courses 4 and 118 (course 118 may be taken concurrently).
Laboratory exercises and demonstrations illustrating hormonal mechanisms. Enrollment limited to ten students.
- 119A-119B. Optics and Metrology in Biology. (2-2) Yr. Mr. Gullberg
119A. The theoretical principles and the critical use of the microscope, spectroscope, and other primary optical instruments. Open to students with upper division or graduate standing in biological or physical science.
119B. The theory and advanced technique of scientific photography, photomicrography, and special photometric methods. Prerequisite: course 119A.
- 120A-120B. Electrical Measurements in Biology. (2-2) Yr. Mr. Gullberg
Lectures and laboratory.
Enrollment limited and requires the consent of the instructor.
An analytical study of direct and alternating current circuits and instruments used in biological research.
- *121. Advanced Physicochemical Biology. (2) I. _____
Prerequisite: course 1A, Mathematics 1, Physics 2A-2B, Chemistry 1A and 8, and a reading knowledge of German. Recommended: courses 101, 102, and 112, Mathematics 3A-3B, Chemistry 109, Biochemistry 105A, Botany 2, and a reading knowledge of French.
The molecular structure, permeability, and electrical relations of protoplasm.
- *122. Advanced Physicochemical Biology. (2) II. _____
Prerequisite: course 121 or equivalent training.
Biological effects of radiant energy.
123. Invertebrate Embryology. (2) II. Mr. Berg
Prerequisite: course 1B.
Special emphasis will be given to the experimental embryology of marine invertebrates.
124. Experimental Invertebrate Zoölogy. (4) I. Mr. Smith
Lectures and laboratory.
Prerequisite: course 112 or consent of the instructor.
Comparative physiology of the invertebrates, with individual laboratory problems on nutrition, respiration, excretion, coördination, and other functions.
- *125. General Ecology. (2) II. Mr. Pitelka
Prerequisite: two semesters of upper division work in biology, or graduate status in a related field.
Study of terrestrial communities, succession, effects of physical gradients, food chains, and population dynamics.
- *125C. Field Ecology. (2) II. Mr. Pitelka
Prerequisite: courses 112 or 113 or equivalent, 125 (may be taken concurrently), and Botany 108.
Study of distribution, composition, and dynamic relations of terrestrial communities in central California; problems of faunal analysis in relation to vegetation; descriptive and quantitative methods. Enrollment limited to ten students.

128. Vertebrate Reproduction. (3) II. Mr. Pearson
Lectures and laboratory.
Prerequisite: courses 100 and 113.
The reproductive biology of native vertebrate animals with special emphasis on mammals. Comparison of cycles and factors influencing reproductive physiology in natural populations.
135. Systematic Mammalogy. (2) I. Mr. Benson
Lecture and laboratory.
Prerequisite: courses 106 and 113.
Principles of classification and nomenclature; anatomy, relationships, and distribution of mammalian groups.
136. Ornithology. (2) I. Mr. Miller
Lecture and laboratory.
Prerequisite: course 113.
Advanced study of classification, anatomy, and function in birds. Enrollment limited to ten students.
- *137. Herpetology. (2) II. Mr. Stebbins
Lecture and laboratory.
Prerequisite: course 113.
Advanced study of classification, anatomy, and functions in amphibians and reptiles.
138. Ichthyology. (4) II. Mr. Needham
Lectures and laboratory.
Prerequisite: course 1B and two semesters of upper division work in zoölogy. Recommended: courses 106 and 116.
Structure, classification, and ecology of fishes, including the application of limnological methods to fish cultural and management problems.
140. Internal Animal Parasites of Man. (4) II. Mr. Kirby, Mrs. Scott
Lecture and laboratory.
Prerequisite: course 1A, or equivalent basic work, and consent of the instructor. Recommended: course 119A.
Lectures primarily on the protozoan and helminth parasites of man, including their host relationships and significance. Laboratory study of materials and methods in protozoölogy of the human host, and of significant helminthological material.
145. Advanced Wildlife Management. (3) II. Mr. Leopold
Lectures and laboratory.
Prerequisite: course 116.
Manipulation of environments in the control of bird and mammal populations. Characteristics of wild populations. Field and laboratory techniques.
197. Extra Session Work. (1-4) The Staff
Work on assigned topics carried on in the field, or in Berkeley when the University is not in session, under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Kirby in charge)
Prerequisite: senior standing with at least a B average in upper division courses in zoölogy; background courses in chosen subjects.

GRADUATE COURSES

For admission to a graduate course a student should have permission of the instructor (which may be given to graduate students and seniors with not less than a B average), and should have 12 units of basic upper division work.

* Not to be given, 1949-1950.

208. Seminar in Invertebrate Zoölogy. (2) I. Mr. Smith
Prerequisite: graduate standing and courses in invertebrate zoölogy.
212. Advanced Marine Invertebrate Zoölogy. (4) Mr. Smith
Given at the seashore in the first Summer Session.
214. Seminar in Heredity and Evolution. (2) I. Mr. Stern
Prerequisite: graduate standing and one course in genetics.
Topics will vary from year to year.
220. Seminar on Speciation in Vertebrates. (2) I. Mr. Miller, Mr. Benson
Prerequisite: course 113.
Problems of speciation and isolating mechanisms in vertebrates.
222. Seminar in Wildlife Management and Population Dynamics. (2) II. Mr. Leopold
Prerequisite: courses 116 and 145 or consent of the instructor.
Review of current research by students; review of literature and special topics.
224. Research. (1-8) I and II. The Staff (Mr. Kirby in charge)
Original study on special topics in laboratory, field, and museum. The work may be carried on in the laboratories at Berkeley or at a marine station at any season of the year. Credit awarded according to work accomplished.
240. Zoölogy Seminar. (No credit) I and II. The Staff (Mr. Miller in charge fall semester; Mr. Stern in charge spring semester)
Meetings for the presentation of original work by the faculty, visiting lecturers, and graduate students.
241. Seminar in Protozoölogy and Parasitology. (2) I. Mr. Kirby
242. Seminar in Experimental Morphogenesis. (1) I. Mr. Eakin, Mr. Berg
243. Vertebrate Review. (1) II. Mr. Benson, Mr. Pearson
Review of current literature.
244. Genetics Review. (1) II. Mr. Stern
Prerequisite: graduate standing and one course in genetics.
Review of current literature and of special topics.
245. Seminar in Advanced Genetics. (2) II. Mr. Goldschmidt
Prerequisite: graduate standing and a course in genetics.
299. Special Study for Graduate Students. (1-4) I and II. The Staff (Mr. Kirby in charge)
Prerequisite: graduate status in zoölogy and consent of the instructor.
Any properly qualified graduate student who wishes to pursue a problem through reading or other advanced study may do so if his proposed project is acceptable to a member of the staff.

MUSEUM OF VERTEBRATE ZOÖLOGY

This Museum, situated in the Life Sciences Building on the Berkeley campus, was founded and endowed by Miss Annie M. Alexander as a repository for specimens and information relative to the higher vertebrate animals of the Pacific Coast region of North America. The particular groups of animals with which it is concerned are the mammals, birds, reptiles, and amphibians; of these, it has a large and continually growing collection, as indicated (on March 28, 1949) by a total of 277,211 catalogue entries. The specimens, with the accompanying field notes, photographs, and maps, provide the bases for studies along systematic, faunistic, ecologic, and economic lines. Persons interested in employing the facilities of the Museum may address the Director.

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Administrative Bulletins of the University of California 1949-1950

The administrative bulletins of the University of California present information concerning the colleges, schools, and departments of the University. For copies of general bulletins and of bulletins or other information concerning instruction at Berkeley and Davis, address the Registrar of the University of California, Berkeley 4; for bulletins concerning instruction at Los Angeles, address the Registrar of the University of California, Los Angeles 24; for bulletins concerning instruction at Santa Barbara, address the Registrar of Santa Barbara College, Santa Barbara; bulletins of the schools and colleges in San Francisco may be had by addressing the deans in charge.

UNIVERSITY OF CALIFORNIA
BULLETIN

Prospectus of the
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Agriculture

FALL AND SPRING SEMESTERS

1949-1950

MAY 10, 1949

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Attention is directed to the fact that courses offered in the College of Agriculture are listed separately in this Prospectus for each of the four campuses of the University on which instruction in agriculture is available.

Students at Berkeley and Los Angeles should consult the General Catalogues published on those campuses for courses given in Colleges other than Agriculture.

UNIVERSITY OF CALIFORNIA

Prospectus of the

COLLEGE OF AGRICULTURE

UNIVERSITY OF CALIFORNIA

Prospectus of the

**College
of Agriculture**

Fall and Spring Semesters

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CALENDAR, 1949-1950†

FALL SEMESTER, 1949-1950

Sept. 12, Monday	Fall Semester begins.
Sept. 13, Tuesday	} Registration.
Sept. 15, Thursday	
Sept. 19, Monday	Instruction begins.
*Nov. 24, Thursday	Thanksgiving Day.
Dec. 19, Monday	} Christmas Recess.
*Dec. 24, Saturday	
*Dec. 26, Monday	
Dec. 31, Saturday	

1950

*Jan. 2, Monday	New Year's Holiday.
Jan. 3, Tuesday	Instruction resumes.
Jan. 14, Saturday	Instruction ends.
Jan. 16, Monday	} Final Examinations.
Jan. 26, Thursday	

SPRING SEMESTER, 1950

Feb. 6, Monday	Spring Semester begins.
Feb. 7, Tuesday	} Registration.
Feb. 8, Wednesday	
Feb. 13, Monday	Instruction begins.
*Feb. 22, Wednesday	Washington's Birthday.
Apr. 24, Monday	} Spring Recess.
Apr. 29, Saturday	
*May 30, Tuesday	Memorial Day.
June 3, Saturday	Instruction ends.
June 5, Monday	} Final Examinations.
June 15, Thursday	

† Information concerning summer courses may be obtained from the Summer Sessions Offices of the University on the Berkeley and Los Angeles campuses.

* Academic and Administrative Holiday.



Air view of the Berkeley campus (1948)

Courtesy, R. L. COPELAND

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H. S. HINKLEY, M.S., Associate Agriculturist.

Ventura—52 N. California Street, Ventura

C. C. DELPHEY, B.S., Associate Agriculturist.
D. E. CREIGHTON, B.S., Associate Agriculturist.
R. A. BRENDLER, B.S., Assistant Agriculturist.
G. E. GOODALL, B.S., Assistant Agriculturist.
LAURA G. COOLEY, B.S., Assistant Home Economist.

Yolo—Courthouse, Woodland

W. D. NORTON, B.S., Agriculturist.
WILLIAM M. HERMS, B.S., Associate Agriculturist.
DAVID M. HOLMBERG, B.S., Assistant Agriculturist.
T. S. TORNGREEN, B.S., Assistant Agriculturist.
JEAN MCCLEW, M.A., Associate Home Economist.

Yuba—Federal Building, Marysville

M. D. COLLINS, B.S., Agriculturist.
LEMUEL OSBORNE, JR., B.S., Assistant Agriculturist.
W. M. ANDERSON, B.S., Assistant Agriculturist.
TUNIA M. VANDENBOUT, A.B., Assistant Home Economist.



Students on the Los Angeles campus use special area devoted to the training of majors in ornamental horticulture

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF AGRICULTURE not only offers resident instruction, but administers the California Agricultural Experiment Station and the California Agricultural Extension Service. In this respect it is unlike the other academic colleges of the University. It also differs in that its administration extends to all four of the campuses where major work in agriculture is offered—Berkeley, Davis, Los Angeles, and Riverside.

RESIDENT INSTRUCTION ON ALL CAMPUSES

Instruction at Riverside is limited to graduate students. Undergraduate instruction (leading to the degree of Bachelor of Science), as well as graduate work, is offered at Berkeley, Davis, and Los Angeles. In general, freshmen may pursue the first two years of their four-year course on any one of these three campuses of the University, at junior colleges, or at state colleges. At the beginning of the junior year, however, students will normally transfer to the campus where major work in their specialty is offered; for, except in the general curriculum in home economics, no major offerings are duplicated. The following table lists the three undergraduate campuses and notes the major subjects that the College offers on each:

BERKELEY	DAVIS	LOS ANGELES
Agricultural Economics Agricultural Engineering* (third year) Entomology and Parasitology Food Science Forestry Genetics Home Economics General Child Development Clothing and Textiles Family Economics Food Chemistry and Technology Nutrition and Dietetics Landscape Design Plant Nutrition Plant Pathology Poultry Husbandry Soil Science	Agricultural Education and General Agriculture Agricultural Engineering* (fourth year) Agronomy Animal Husbandry Dairy Industry Home Economics (general) General Horticulture Irrigation Plant Pathology Pomology Truck Crops Veterinary Medicine Viticulture and Enology	Agricultural Engineering* (third year) General Horticulture Ornamental Horticulture (including Floriculture) Subtropical Horticulture

In addition to these major subjects, all the necessary supporting courses are offered on all three campuses. Service courses in a given major field are often available on campuses other than the one that offers the complete sequence of work for the major. The entrance requirements for degree work on all three campuses are identical.

At Davis, instruction in the Two-Year Curricula in Agriculture is also provided for persons who wish to obtain, in a comparatively short time,

* An offering in the Colleges of Engineering.

information about California agriculture, but who do not desire or are not qualified to take the regular four-year degree program of study.*

BERKELEY CAMPUS

The main headquarters of the College of Agriculture are at Berkeley; however, sections of the Dean's Office are maintained on the Davis and Los Angeles campuses. As indicated in the table above, the major subjects offered on this campus are restricted mainly to majors in what might be termed the specialized, professional areas of agriculture and home economics, rather than majors in the production areas. All courses in the University are open to students in agriculture on the same terms as those applying to other University students.

The activities of the College are carried on in Agriculture Hall, Hilgard Hall, Giannini Hall, Forestry Building, Life Sciences Building, and the buildings housing the divisions of Poultry Husbandry and Veterinary Science. Fourteen greenhouses and eleven headhouses provide facilities for research and both undergraduate and graduate instruction. Planned for the immediate future is a new building for the Department of Home Economics.

The Berkeley campus of the University, situated on sloping hills overlooking San Francisco Bay and directly opposite the Golden Gate, comprises about 600 acres. The climate, without extremes of temperature, is well suited for university work throughout the year.

Descriptions of the courses offered in Berkeley will be found on pages 109-133.

DAVIS CAMPUS

This campus, situated in the city of Davis in Yolo County, is 13 miles west of Sacramento and 67 miles northeast of Berkeley. It specializes in the production fields of agriculture, general curriculum in home economics, the field of agricultural education, and veterinary medicine. The teaching facilities are impressive; and the area of high-class agricultural land available, which now totals 2,175 acres, makes possible exceptional demonstration and research plantings. Besides many modern buildings devoted to teaching and experimentation, there are also the necessary barns, creamery, greenhouses, seedhouse, and other specialized facilities for a well-rounded program in agriculture. An ultra-modern School of Veterinary Medicine Building is now under construction, and a new Soil Science Building and Plant Science Building have been completed.

Descriptions of the courses offered on the Davis campus are given on pages 137-173.

LOS ANGELES CAMPUS

The Los Angeles campus is the center for instructional work in general horticulture as it relates to subtropical fruits, ornamental plant materials, and flower crops. Most of the laboratory and classroom facilities are in the north

* For those interested, the bulletin entitled ANNOUNCEMENT OF THE TWO-YEAR CURRICULA IN AGRICULTURE may be obtained without charge from the College of Agriculture at Davis or Berkeley.

wing of the Physics-Biology Building. These facilities are modern and effective and include a controlled environment installation for physiological and storage studies.

Forty acres, consisting of the 14-acre subtropical horticulture area and the 26-acre ornamental horticulture area, have been allocated to the College of Agriculture. The latter area is being developed as rapidly as practicable. Floriculture plantings for research purposes have already been established; and glasshouses and headhouses for research in floriculture and ornamental horticulture, including entomology and plant pathology, have recently been constructed.

General horticulture, ornamental horticulture (including floriculture), and subtropical horticulture are the only agricultural majors that can be completed entirely on the Los Angeles campus.

Descriptions of the courses offered at Los Angeles will be found on pages 177-183.

RIVERSIDE CAMPUS

By legislative enactment, the Citrus Experiment Station of the College of Agriculture, as it now exists, was created at Riverside in 1913, and an outstanding center of research in subtropical agriculture has been developed there. Available on the 751 acres of this campus, of which more than 300 are given over to orchard and nursery plantings, are splendid facilities, including a library, laboratories, a modern insectary, greenhouses and lathhouses, and an orchard tree lysimeter installation.

Early in its history graduate instruction was instituted, which at present is confined to students working for the doctorate who have satisfied all course requirements and have left for completion only their research problems. The courses available, therefore, are limited to seminars and graduate research. Descriptions of the courses offered at Riverside will be found on page 187 of this prospectus.

THE AGRICULTURAL EXPERIMENT STATION

The research program in agriculture for the State of California is the responsibility of the Agricultural Experiment Station, an integral part of the College of Agriculture of the University of California. The work is supported jointly by federal and state funds. Most of the teaching staff of the College hold Experiment Station titles, and their research work constitutes the projects of the Experiment Station. This feature is particularly valuable from the standpoint of resident instruction: (1) it increases the number of instructors available and allows for instruction by specialists rather than general teachers who must of necessity cover many subjects; (2) it brings the students into daily contact with active research projects; and (3) it makes available to them many facilities and much equipment that could scarcely be brought to the campus for instructional use alone. Facilities and personnel of the station are distributed

on all four campuses of the college and at numerous other points throughout the State, such as the Meloland Station in Imperial Valley, the Deciduous Fruit Field Station at San Jose, and the Blodgett Forest in El Dorado County.

THE AGRICULTURAL EXTENSION SERVICE

The Agricultural Extension Service extends to the farmers of California the results of the researches of the Experiment Station and the United States Department of Agriculture. Farm Advisors are established in forty-eight counties of the state,* and Home Demonstration Agents are at work in thirty-nine counties. 4-H clubs are organized among the younger people in many localities. Thus farmers may come into direct touch with the College of Agriculture through its own representatives.

* The list of Farm Advisors, by counties, is given on pages 25-31.

MISCELLANEOUS UNIVERSITY INFORMATION

EXPENSES

THE TOTAL AVERAGE yearly expense in the College of Agriculture is estimated at approximately \$700 for the student who is a resident of California, and \$850 for the nonresident student. The entering student must be prepared to meet expenses amounting to \$150 in the first month.

FEEES

Tuition Fee.—Tuition is free to residents of California. The student classed as a nonresident pays a tuition fee of \$150 a semester, in addition to the incidental fee. (See the GENERAL CATALOGUE, Berkeley or Los Angeles, for regulations concerning the tuition fee.)

Incidental Fee.—The incidental fee for the student at Berkeley is \$35, and at Davis it is \$42.50. The incidental fee for undergraduate students at Los Angeles is \$39. This fee, which must be paid on the date of registration, covers certain expenses of students for library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, for registration and graduation, for all laboratory and course fees, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service on each campus. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges.

The incidental fee at Los Angeles and Davis includes the student body membership fee. At Berkeley, the student pays an additional \$10 a year to join the student body association. Membership privileges include participation in student affairs, a free subscription to the student newspaper, free admission to many athletic contests and reduced admission rates to others, and membership in the Henry Morse Stephens Memorial Student Union, which is the center of campus life.

Graduate students who have received cadet appointments for teacher training are required to pay only a \$3 incidental fee each semester or summer session.

LIVING ACCOMMODATIONS AND COSTS

Berkeley

Advice and information about all types of living accommodations may be obtained from the Housing Office, Building Q, University of California, Berkeley 4, California. Lists of approved boarding and lodging houses for men and women, lists of rooms in private homes, and apartments (including those available in the two Veterans Villages in Albany and Richmond) are all available at the Housing Office.

The cost of room and board depends entirely upon the type of accommodations desired. In the residence halls and boarding houses, the estimated cost per semester is between \$250 and \$330 for men, and between \$250 and \$350

for women. In most of the boarding houses, the cost includes room and 12 or 14 meals a week. In the University residence halls and International House, the cost includes room and 20 meals a week. In coöperative houses for single men, the cost is approximately \$190 to \$205 a semester plus 5 hours of work a week. In coöperative houses for single women, the cost is between \$180 and \$195 a semester plus 5 hours of work a week. Rooms in private homes and apartments vary greatly in price depending upon size and location. Apartments are difficult if not impossible to find.

Householders and students are expected, at the time the accommodations are arranged for, to have a contract in writing covering terms of payment, indicating whether or not rent is to be paid during vacations, what laundry facilities are available, stating the number of meals served per day and including any other matters which would affect their business relations. Students should read with care any contemplated contract, in order that no misunderstanding may arise either on the part of the householder or the student. Contracts in the University residence halls are for the period of an academic year. Customarily, arrangements for other accommodations are made for a period of at least an entire semester.

Approved boarding and lodging houses, exclusively for women, have been inspected by the University authorities. They are all within walking distance of the campus. A list of these houses is published annually. Reservations must be made with the person whose name appears on the list as manager.

University residence halls for women include Stern Hall and the seven Fernwald halls: namely, Mitchell, Peixotto, Richards, Oldenberg, Freeborn, Cheney, and Cunningham halls. Stern Hall is a gift of Mrs. Sigmund Stern; it accommodates 89 undergraduate women. The price for room and board is \$325 a semester or \$650 for the academic year. Application must be made to the Housing Office the semester prior to prospective residence. The Fernwald halls accommodate 466 women. Five of the halls house 78 undergraduate women each, and two of the halls house 38 undergraduate women each. The price for room and board is \$315 a semester or \$630 for an academic year. Application should be made to the Housing Office, Building Q.

Approved boarding and lodging houses, exclusively for men, have been inspected by the University authorities. These houses are within walking distance of the campus. Reservations must be made with the person whose name appears on the list as manager.

The University residence hall for men, Bowles Hall, is a memorial to Philip Ernest Bowles, member of the Class of 1882 and for twelve years a Regent of the University. Two hundred and four undergraduate men can be accommodated. The price for room and board is \$295 a semester or \$590 for an academic year. Application must be made to the Housing Office the semester prior to prospective residence.

Davis

The University maintains at the College of Agriculture at Davis residence halls for men and women, a dining hall, and emergency housing apartments for married veterans. Board and room in the University dormitories costs approximately \$235 a semester. The price is about the same in private homes in the city of Davis and in the various fraternities and clubhouses.

Rooms in the residence halls contain the necessary furniture, linen, and blankets; the rent includes the weekly laundering of linen. For further information write to the Residence Halls Supervisor, College of Agriculture, Davis, California.

All women students under 21 years of age are required at the time of registration to have their college residence approved by the Adviser to Women. This approval is given to women students living with their parents and to those living in the University dormitories or in houses which have been approved by the University.

Los Angeles

Mira Hershey Hall, a dormitory for women, provides board and room for 129 students at \$300 per person a semester. There is no University dormitory for men on the Los Angeles campus.

The cost of board and lodging near the campus ranges from \$65 to \$80 a month. The student who does his own cooking may obtain a housekeeping room for from \$30 to \$50 a month.

Women students are not permitted to live in apartments unless the Dean of Women approves their arrangements for chaperonage.

Lists of approved boardinghouses for men and for women and information concerning sororities, fraternities, residence halls, and coöperatives may be obtained from the Housing Office, Room 105, Building 1L, and from the Office of the Dean of Students.

More detailed information regarding the accommodations at Los Angeles may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES, obtainable for 25 cents from the Registrar, University of California, Los Angeles 24, California.



Air view of the Los Angeles campus

OFFICE OF VETERANS AFFAIRS

An Office of Veterans Affairs, in the charge of a Coördinator of Veterans Affairs, has been established by the University to work out with returning service men and women the many irregularities in their educational programs resulting from war service, to maintain liaison in their behalf with the United States Veterans Administration, and to assist them in becoming assimilated in the life and spirit of the University.*

In addition, the United States Veterans Administration maintains an office, in the charge of a Training Officer, to assist returning service men and women who are applying for federal educational benefits.†

Information regarding educational benefits available from the State of California may be obtained from the California Veterans Welfare Board, Sacramento 7, Sacramento.

Veterans must present an original or supplemental Certificate of Eligibility and Entitlement (Veterans Administration Form 7-1950 or 7-1953) and register within the registration period to obtain full veteran benefits. Veterans should apply to their local United States Veterans Administration Office in sufficient time to receive their certificates of eligibility prior to registration, or be prepared to pay all expenses (tuition, fees, books, and supplies).

Counseling centers are located on or in the vicinity of each campus. Services of these centers are available to all veterans without cost. They offer vocational counseling which may include aptitude testing and use of the center's library of occupational materials, as well as extensive interviewing.

STUDENT HEALTH SERVICE

A Student Health Service is maintained by the University on its campuses at Berkeley, Davis, and Los Angeles. The purpose of this service is to conserve the time of students for their classwork and studies by preventing and treating acute illnesses. This service is made possible by the general funds of the University and in part by the staff physicians, and is not a health insurance plan; therefore, the services are limited by the staff and facilities available.

Each registered student on any of these campuses may, at need, have such consultations and medical care as the Student Health Service on the particular campus is staffed and equipped to provide, from the time of payment of his registration fee to the last day of the current semester.

Hospitalization for a limited time is provided on the Berkeley and Davis campuses on recommendation of the University physician. If illnesses are of a nature requiring long-continued care so that the student may not be returned to classes during the current semester, or if at the end of the semester the

* This office is situated on the Berkeley campus in Building F, Dana Street; on the Davis campus in Room 206, Library and Administration Building; and on the Los Angeles campus in Room 321, Administration Building.

† Berkeley campus, Building E, Dana Street; Davis campus, Room 207, Library and Administration Building; Los Angeles campus, Room 115, Building 1L.

patient is still ill, he will be released to his home or community as soon as the University physician considers it safe. Charges will be made for unusual appliances or remedies not ordinarily available or for hospitalization in excess of thirty days.

The Health Service does not take responsibility for certain chronic physical defects or illnesses present at the time of entrance (for example, hernias, chronic bone and joint diseases or deformities, chronic gastrointestinal disorders, fibroids of the uterus, chronically infected tonsils, tuberculosis, syphilis, malignant diseases, and allergic and endocrine disorders).

Furthermore, it does not take responsibility for any injury or illness wherein treatment has been initiated elsewhere, with the exception of first aid and emergency care. It does not take responsibility for remedial defects where medical or surgical treatment is elective and not of an emergency nature, and where the best interests of the student will be served by treatment during vacation.

OPPORTUNITIES FOR STUDENT EMPLOYMENT

Self-supporting students have many opportunities for employment. A diligent student may spend from twelve to twenty-five hours a week in outside employment while undertaking a study program of from 12 to 16 units, which requires from thirty-six to forty-eight hours of work a week. The student seeking employment should bear in mind, however, that not every kind or amount of outside work is compatible with his main purpose at the University, namely, his education.

Only rarely may a student be entirely self-supporting. No student who intends to support himself should enter the University without sufficient funds to cover the expenses of the first semester. The State Labor Code of California prohibits the employment of an alien by any department of the State. In conformity with this law, no alien student may be employed by the University. Students seeking work should apply to the Bureau of Occupations, Berkeley or Los Angeles, or to the Office of the Comptroller, Davis.

LOANS

In addition to the general University loan funds, regulations for which are given in the GENERAL CATALOGUE, a number of specific loan funds have been established for students of agriculture. Applications for loans should be made to the Loan and Scholarship Officer at Berkeley and to the Assistant Dean at Davis. Students at Los Angeles should apply to the Committee on Loans.

SCHOLARSHIPS AND FELLOWSHIPS

For information regarding undergraduate scholarships on the Berkeley and Davis campuses, write to the Committee on Undergraduate Scholarships, University of California, Berkeley 4. For information concerning scholarships on the Los Angeles campus, write to the Committee on Undergraduate Scholarships, University of California, Los Angeles 24.

Although all students of the College of Agriculture are eligible to become candidates for any general University scholarship, the following undergraduate scholarships by terms of their bequests are restricted to students of this College.

Borden Agricultural Scholarship, \$300.—The award is made annually on the Davis campus by the Borden Company to a student entering his senior year in agriculture who has taken at least two courses in dairy subjects, and holds the highest scholastic standing among similarly eligible students.

Borden Home Economics Scholarship, \$300.—This award is made annually on the Berkeley campus by the Borden Company to a student entering her senior year in home economics who has taken at least two courses in nutrition and holds the highest scholastic standing among similarly eligible students.

Jesse D. Carr Scholarships and Fellowships.—These awards were established through the bequest of Mrs. Henry W. Seale (Jesse D. Carr) for the benefit of students in the College of Agriculture.

Farm Home Department Home Economics Scholarship, \$300.—This scholarship was established by the Farm Home Department of the California Farm Bureau Federation. It is awarded annually at Davis to a student majoring in home economics, preferably a sophomore from a rural home.

Herbert Kraft Scholarships, approximately ten scholarships, averaging \$300 each.—These scholarships, which are established from the income of the sum of \$50,000 given, in 1917, to the Regents of the University by the late George S. Kraft in memory of his father, are open to any graduate of a high school in Tehama County, California, if he or his parent or parents have lived in that county for at least five years.

Loughridge Scholarship.—The late Professor R. H. Loughridge bequeathed a sum of \$3,000 to the University for the establishment of a scholarship for a student in the College of Agriculture.

Alex McDonald Undergraduate Scholarship in Animal Husbandry.—The award is made annually on the Davis campus, and is restricted to students in animal husbandry.

James Monroe McDonald Scholarships, three with a stipend of \$300 or more.—A series of scholarships was established in 1921, by the late Mrs. Mary J. L. McDonald. Each applicant for one of these scholarships must be a male student who uses correct English and has good character and courteous manners, and must be enrolled or have his major studies in the department in which the scholarship is given. The scholarships are primarily for undergraduates, but may be awarded for one year of postgraduate study.

Three of these scholarships are awarded annually to students in the College of Agriculture at Berkeley or Davis who have attained senior standing; one to a student who is taking special work in stock raising and grazing; one to a student specializing in horticulture; and the remaining one to a student in any major in the College of Agriculture.

Dr. S. T. Michael Scholarship Fund for Veterinary Students.—This award was established in 1942 by a gift of \$1,000 from Mr. and Mrs. Berthold Guggenheimer.

Henry W. Seale Scholarship.—These are loan scholarships. The beneficiaries must agree to return to the University of California all or part of the sums they may have received from the scholarships, without interest, when their financial condition is such that a return can be made without serious inconvenience.

Peter J. Shields Scholarship, approximately \$300.—Established by Regent Garret W. McEnerney for a student of the College of Agriculture enrolled on the Davis campus, and preferably from Sacramento County.

Leopold Edward Wrasse Scholarship, \$300.—Established by the late Leopold Edward Wrasse, a farmer in Fresno County. Awarded annually to a junior or senior student enrolled on the Davis campus.

RESEARCH ASSISTANTSHIPS IN THE AGRICULTURAL EXPERIMENT STATION

Several research assistantships at an annual stipend of \$1,540 are available for graduate students. These involve half-time employment during the two regular sessions of the University and full-time work during the summer vacation.

PRIZES

Alpha Zeta Award in Agriculture.—An award made by the Alpha Zeta fraternity, agricultural honor society, each fall, to the sophomores in the College of Agriculture, one at Berkeley and one at Davis, who have made the highest scholarship records in their first year's work. The names of the winners and their scholarship records are engraved each year upon a permanent plaque.

John Belling Prize in Genetics.—Established by Mr. James Belling and Miss Annie Belling in memory of their brother, the late Dr. John Belling, Research Associate in Genetics in the University of California from 1927 to 1933. A prize of approximately \$75 to be awarded in June, 1950, and in each succeeding fifth year, to a recipient of the degree of Ph.D. in genetics during the five-year period ending in June, 1950, and during each succeeding five-year period. The basis of award shall be (1) scholarship, (2) research ability, and (3) fundamental contribution to biology.

Burpee Award in Floriculture.—Established by the W. Atlee Burpee Company, Seed Growers, Philadelphia, Pennsylvania, and Clinton, Iowa. A prize of \$50 to be awarded to the student in his third year in the College of Agriculture recommended by the Division of Ornamental Horticulture on the basis of his scholarship, practical experience, and interest in floriculture.

Burpee Award in Truck Crops.—Established by the W. Atlee Burpee Company, Seed Growers, Philadelphia, Pennsylvania, and Clinton, Iowa. A prize of \$50 to be awarded to the student in his third year in the College of Agriculture

and recommended by the Division of Truck Crops on the basis of scholarship, practical experience, and interest in vegetable crops.

California Farm Bureau Federation Rural Leadership Trophy.—Given by the California Farm Bureau Federation, and awarded to the senior student in the College of Agriculture who shows, by his ability, energy, and coöperative spirit, the greatest promise of leadership in the development of the farm and farm home. The name of the winner is engraved on a permanent plaque displayed in the offices of the College of Agriculture on the campus where the recipient is resident.

Howard Walton Clark Prize in Plant Breeding and Soil Building.—Established by Mrs. Prudence L. Clark in memory of her late husband, Howard Walton Clark, sometime Curator of the Department of Ichthyology of the California Academy of Sciences. A prize of \$100 to the senior student in the College of Agriculture whose high scholastic achievement, talent for independent research, and other characteristics, with particular reference to either plant breeding or soil building, seem to show the greatest promise.

Mary Jeanne Gilhooley Memorial Award.—Established by the Associated Students at Davis in 1942–1943 in memory of Mary Jeanne Gilhooley, a student on the Davis campus killed in an automobile accident. An award to a graduating woman, resident at the Davis campus for at least four semesters, to be made on the basis of scholarship and participation in activities. A certificate is presented to the woman best meeting the qualifications, and her name is placed on the permanent memorial plaque.

John W. Gilmore Foreign Student Award.—A plaque presented to the Associated Students of the College of Agriculture at Davis in 1948 by Mr. L. N. Irwin in memory of Professor John W. Gilmore, who contributed much to the better understanding and fellowship between foreign and native students. The award to be made to a foreign student (graduate or undergraduate) who has a high scholastic record, participates in campus activities, and contributes to international understanding and friendliness both on the campus and beyond its borders. A certificate is presented to the student meeting the qualifications, and his name is placed on the permanent memorial plaque.

The Johnson Award in Forestry.—Established by Colonel S. Orie Johnson and the California Forest Protective Association to provide an incentive for forestry graduates of the University to seek careers in the forest industries of the State. The award is based on academic performance in the School of Forestry and demonstrated aptitude for industrial forestry. Preliminary selection of candidates will be made by the faculty of the School from students attending summer camp prior to the junior year; and, in order to retain eligibility, the candidates shall have had employment in the forest products industry of the State throughout the period of their vacation between the junior and senior years. Each of the five best candidates selected at the begin-

ning of the senior year will receive an award of \$100 and upon graduation, the candidate then of first choice will receive an additional \$150.

W. P. Lindley Trophy for Scholastic and Athletic Achievement.—A plaque donated in the spring of 1923 by Mr. W. P. Lindley, the sixty-year-old retired sea captain who, when a student at Davis, was affectionately known as the "Skipper." It is awarded each year to an athlete who is considered most outstanding in sports, student activities, and scholarship.

Warden Prize in Dairy Industry.—Established by Messrs. Robert and James Warden of Australia. A small prize awarded to the student in dairy industry who has maintained the highest scholastic record in the three-year period covering his freshman, sophomore, and junior years.

Xi Sigma Pi Awards in Forestry.—Two annual scholastic awards for forestry students made by Xi Sigma Pi, the honorary forestry fraternity. An award is made to the sophomore who attained the highest grade-point average during his freshman year on the Berkeley campus while following a preforestry course of studies of not less than 30 units. A senior award is given to the forestry major in the previous senior class who had the highest scholastic average during his junior and senior years at the University of California. His grade-point average must be over 2.00 and he must have taken a full program during those years. The name of the winner of each award is inscribed on the appropriate permanent plaque maintained in the Office of the School of Forestry. In addition, the senior chosen is presented one book of his choice on the subject of forestry or an allied field.

STUDENT ACTIVITIES

Students in the College of Agriculture participate not only in the general student affairs of the University, but also in activities of their own.

Most of the divisions at Berkeley have divisional clubs made up of both graduate and undergraduate students. These clubs are social as well as professional in character. They hold meetings at least once a month to discuss matters of interest in their departments, and outside speakers connected with the particular fields of interest are frequently invited to address students in regard to job opportunities and profitable lines of research.

The national professional honor fraternity for agriculture students is Alpha Zeta, founded at Ohio State University in 1897. In 1908 the California Chapter was established at Berkeley; in 1937 the California Beta chapter at Los Angeles; and in 1938 the California Gamma chapter at Davis. Members are selected for personality, capacity for leadership, and scholarship.

The national honor society for students in home economics, Omicron Nu, has a chapter, Alpha Lambda, at Berkeley. In addition, the Home Economics Club, which is open to all students, maintains an active program of meetings and projects.

At Davis nearly every form of activity is maintained. The entire student

body are members of the Associated Students of the California Aggies, which governs all student affairs on the campus and supervises the Honor System.

The students at Davis publish *El Rodeo*, a yearbook, and the *California Aggie*, a weekly newspaper.

Opportunity to participate in many forms of athletics is presented at Davis. The California Aggies are members of the Far Western Conference and stress both intercollegiate and intramural athletics. The major sports include football, basketball, boxing, track, and baseball; the minor sports are tennis, wrestling, golf, riding, swimming, and skiing.

The Associated Student of the California Aggies support other activities as well. These include the band, the orchestra, the men's and women's choruses, debating, dramatics, radio broadcasting, and the rifle team. The California Club, designed to emphasize the unity of student life on all campuses of the University, is active.

Many organizations sponsor the development of special interests at Davis. The Golden Hoof Club, the Blue and Gold Dairy Club, the Horticultural Round Table, the Home Economics Club, the Senior 4-H Club, and the Gilmore Collegiate Chapter of the Future Farmers of America meet regularly to hear outstanding speakers and to enjoy social contacts. The Music Association encourages the further use of talents; the Women's Association includes all women students on the campus; and the International Forum promotes friendly relations between foreign-born and native students, and studies world problems.

The Agriculture Club provides the medium for organized student body activities on the Los Angeles campus.

DISCIPLINE

When a student enters the University it is taken for granted by the University authorities that he has an earnest purpose and that his conduct will bear out this presumption. If, however, he should be guilty of unbecoming behavior or should neglect his academic duties, the University authorities will take such action as, in their opinion, the particular offense requires. Students who fail to make proper use of the opportunities freely given to them by the University must expect to have their privileges curtailed or withdrawn.

By authority of the Academic Senate, the President of the University is entrusted with the administration of student discipline with full power to act. He accomplishes this through the assistance of his teaching staff, the administrative officers concerned with student welfare, and the Faculty Administration Committee on Student Discipline. There are five degrees of discipline: warning, censure, suspension, dismissal, and expulsion. Censure indicates that the student is in danger of exclusion from the University. Suspension is exclusion from the University for a definite period. Dismissal is exclusion for an indefinite period, with the presumption that the student's connection with the

University will be ended by it. Expulsion is the most severe academic penalty, and is final exclusion of the student from the University, and in effect excludes him from other institutions in the state.

SCHOLARSHIP

Minimum Requirements

Probation.—A student will be placed on probation

(1) If at the close of his first semester his record shows a total deficiency of 6 or more grade points; or

(2) If at the close of any subsequent semester, his grade-point average is less than 1 (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

Dismissal.—A student will be subject to dismissal for scholarship

(1) If during any semester he fails to pass with a grade of C or higher courses totaling at least 4 units; or

(2) If while on probation his grade-point average for the work undertaken during any semester falls below 1 (a C average); or

(3) If after two semesters of probationary status he has not obtained a grade-point average of 1 (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

A student who becomes subject to the provisions of this regulation will also be subject to such supervision as the faculty may determine. The faculty may dismiss from the University students under its supervision or may suspend the provisions of this regulation and permit the retention in the University of the students subject to dismissal, and the return to the University of students who have been dismissed under this regulation.

Right of Appeal.—Any student who receives a notice of dismissal from the University may petition the Dean for a hearing. Ordinarily, however, students dismissed for unsatisfactory scholarship will be excluded from the University for an indefinite period, with the presumption that their connection with the University will be ended by such exclusion.

Grades and Grade Points

In the College of Agriculture the result of the student's work in each course (graduate and undergraduate, including courses in which credit is sought by examination) is reported to the Registrar in one of six scholarship grades, four of which are passing, as follows: A, excellent; B, good; C, fair; D, barely passing; E and F, not passing. Grades are not otherwise defined, as for example, by percentages, or by a rule stipulating the manner in which the several grades shall be distributed.

Grade E (not passed) indicates a record below passing, but one which may be raised to a passing grade without repetition of the course by passing a further examination or by performing other tasks required by the instructor. Grade

F (not passed) denotes a record so poor that it may be raised to a passing grade only by repeating the course.

The term "incomplete" is not used in reporting the work of students. The instructor is required to assign, for every student, a definite grade based upon the work actually accomplished, irrespective of the circumstances which may have contributed to the results achieved.

Course reports filed by instructors at the end of each semester are final, not provisional.

Grade points are assigned to the respective scholarship grades as follows: for each unit of credit, the scholarship grade A is assigned 3 points; B, 2 points; C, 1 point; D, E, and F, no points.

Every student who desires to obtain his scholarship grades at the end of the semester should deposit with the Registrar a self-addressed stamped envelope for the return of his report.

CREDIT BY EXAMINATION

Provision is made whereby an undergraduate student in residence and in good standing may under certain conditions take examinations for degree credit either (a) in courses offered in the University, without formal enrollment in them, or (b) in subjects appropriate to the student's curriculum, but not offered as courses by the University. The results of all such examinations, with grades and grade points, are entered upon the student's record in the same manner as for regular courses of instruction.

The privilege of taking an examination for credit will ordinarily be granted only to students who have at least a B average for all courses undertaken in the University.

Arrangements must be made in advance with the dean of the student's college or school; his approval, and that of the instructor who is appointed to give the examination, are necessary before an examination can be given.

The application form for examinations may be obtained from the Registrar.

HONORS

Honorable Mention in Junior Standing.—The student who has completed 62 units in the curriculum of his choice, and thereby attains junior standing in the College, is given honorable mention if he has obtained an average of at least two grade points for each unit of credit undertaken. He remains in honor status unless his scholarship for any one semester falls below this average.

Honors with the Bachelor's Degree.—Honors are granted to the graduating student who has completed his major with distinction and whose general record is satisfactory to the Study-Lists Committee of the faculty. The student who has done work of unusual excellence may be recommended for highest honors.

The list of students who have received highest honors and honors is published in the COMMENCEMENT PROGRAMME.

OTHER UNIVERSITY RULES

The student should familiarize himself with other University rules and regulations, and with the details of those which have been outlined above. This information is given in the GENERAL CATALOGUE, which may be obtained at a cost of 25 cents from the Registrar, either at Berkeley or at Los Angeles. Additional rules and procedures which apply on the Davis campus may be obtained from the Recorder, University of California, College of Agriculture, Davis, California.

GENERAL ADMISSION REQUIREMENTS

UNDERGRADUATE STATUS

AN APPLICANT who wishes to enter the University must fulfill the general requirements for admission, as set forth below. Application blanks may be obtained from the University Admissions Director, University of California, on the campus at which registration is desired. Every applicant for admission is required to pay a fee of \$5 when the first application is filed.* Remittance by bank draft or money order should be made payable to The Regents of the University of California. With the application for admission there must be filed a certificate showing successful vaccination against smallpox within the last seven years. A form for this purpose will be furnished by the University, and must be signed by a licensed physician or registered nurse.

The University of California bases its entrance requirements on two principles: first, that the best guarantee of success in the University is high quality of scholarship in previous work, and second, that the study of certain specified subjects will give to the student both good preparation for the work of the University and reasonable freedom of choice of a major field of study after his entrance. These principles apply to admission in either freshman or advanced standing.

LIMITATION OF ENROLLMENT OF OUT-OF-STATE APPLICANTS

Within the limits of its capacity, the University of California ordinarily makes no restriction on admission of applicants from areas outside of California. Out-of-state students will be admitted to the junior and senior classes provided they meet the regular requirements for admission to the University, but enrollment in the freshman and sophomore classes will be restricted to students of exceptional promise (the upper half of applicants ordinarily eligible). Such applicants must submit, in addition to scholastic records, a properly certified standing on either the College Entrance Examination Board Scholastic Aptitude Test or the American Council on Education Psychological Examination.

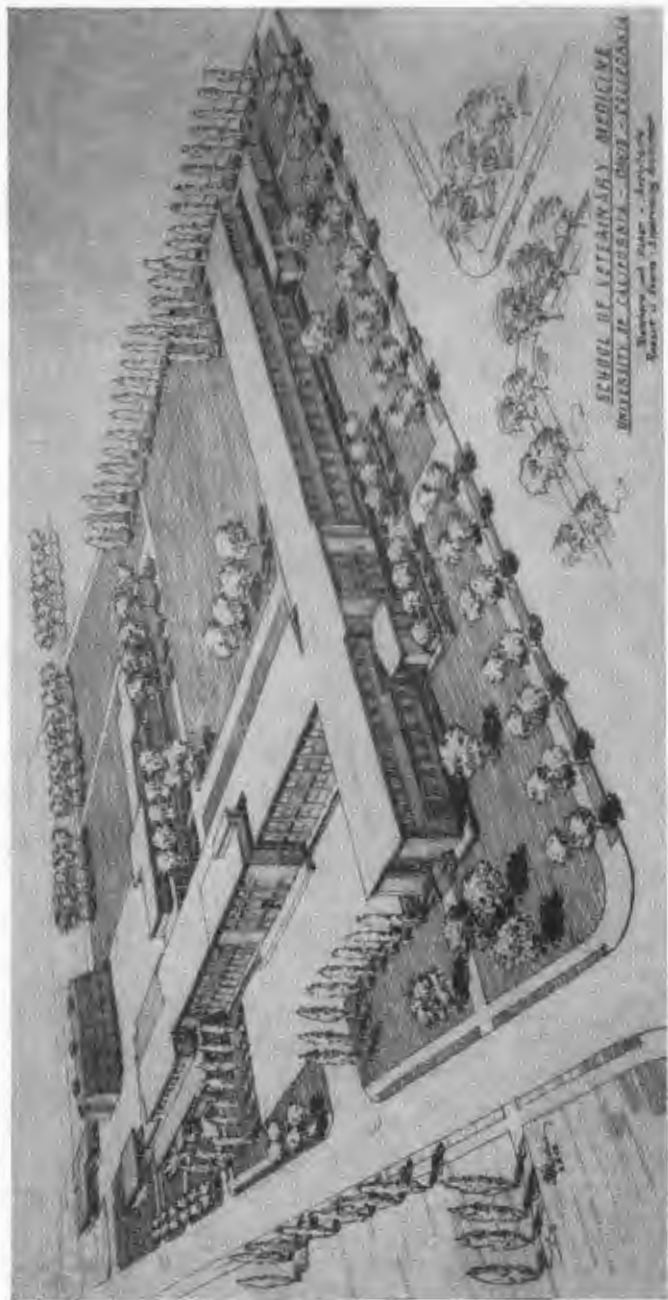
There are special limitations concerning nonresidents in certain of the professional schools and colleges. Students desiring to enter these schools should keep informed as to the prerequisite requirements, date of application, and required aptitude examinations.

ADMISSION IN FRESHMAN STANDING (BERKELEY, DAVIS, AND LOS ANGELES CAMPUSES)

ADMISSION ON THE BASIS OF THE HIGH SCHOOL RECORD

The applicant must file with the Admissions Office a regular application, on or before the last date for the receipt of applications for the semester desired, and

* Veterans who expect to enroll under the provisions of Public Law 346 or Public Law 16 are not required to remit this fee at the time of application; if the applicant is accepted and registers in the University, the fee will be paid by the government.



Architects' sketch of the School of Veterinary Medicine, Davis campus

must have the secondary schools he has attended send to the Admissions Office complete transcripts of record of all studies undertaken in those schools. Such transcripts must show that the applicant has graduated from an accredited high school.† The Admissions Office will then evaluate the high school record, and the applicant will be eligible for admission if he qualifies under any one of the following methods:‡

1. Complete the high school courses listed under (a) to (f) below with grades that demonstrate ability to do University work with good prospect of success. Courses in the (a) to (f) list taken in the ninth grade need show passing marks only; courses in the (a) to (f) list taken in the tenth, eleventh, and twelfth grades must be passed with marks that will make an average of grade B. Courses in which a grade of D is received may not be counted either in reckoning the required scholarship or in satisfaction of the subject requirements. Grade A in one course will balance a grade C in another course. Grades are considered on a semester basis, except from schools that give only year marks.

The courses that must be completed under this plan of admission are as follows:

- (a) History 1 unit. —This requirement must be satisfied by 1 unit of United States history or 1 unit of United States history and civics.
- (b) English 3 units.—These may consist of any six semesters that give preparation in written and oral expression and in the reading and study of literature. Reading and study of contemporary literature may be included. The requirement in English must be satisfied by credit designated "English."
- (c) Mathematics 2 units.—These must consist of two semesters of elementary or advanced algebra, and two semesters of plane geometry, or solid geometry and trigonometry. (See "Preparation for Curricula in Agriculture," page 54.)
- (d) Science 1 unit. —This may consist of a year course in one field of science, namely, biology, botany, chemistry, physics, physical science, physiology, or zoölogy. The science selected must be an advanced (3d- or 4th-year) laboratory science, and the two semesters must be in the same subject field. (See "Preparation for Curricula in Agriculture," page 54.)
- (e) Foreign language 2 units.—These must be in one language.

† An accredited high school is one that has been officially designated, under the rules of the Board of Regents of the University, as a school from which graduates will be admitted to the University without examination, on the basis of the high school record of subjects completed and scholarship attained. The list of accredited schools is published by the University annually in the month of June or July. For information concerning the accrediting of schools, principals may communicate with the Director of Relations with Schools, Berkeley or Los Angeles.

‡ Although this minimum program will entitle the student to entrance in the University, it will not give him the right to enter unconditionally the curriculum of his choice unless he has credit for the prescribed subjects. Information regarding the preparation required and recommended for each curriculum may be found in the GENERAL CATALOGUE for the campus concerned, or in the special leaflet, *PREREQUISITES AND RECOMMENDED SUBJECTS*.

(f) Advanced course chosen from one of the following

1 (or 2) units.—(1) Mathematics, a total of 1 unit (second-year algebra, $\frac{1}{2}$ or 1 unit; solid geometry, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit); (2) foreign language, either 1 additional unit in the same foreign language offered under (e), or 2 units of a different foreign language; (3) science, 1 unit of either chemistry or physics in addition to the science offered under (d) above.

2. Achieve a scholarship rank in the highest tenth of his graduating class, with a substantial academic preparation, although he need not complete the exact pattern of subjects (a) to (f) listed above.

3. Complete not less than 15 high school units of grade A or B in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units of grade A or B in the work of the tenth, eleventh, and twelfth years; and not more than two subject deficiencies in the required list (a) to (f).

4. Complete not less than 15 high school units with no grade lower than C in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years; and not less than 6 high school units of grade A or B selected from the following 10 units of academic subjects:

Third- and fourth-year English
 Third- and fourth-year mathematics
 Third- and fourth-year laboratory science
 Third- and fourth-year foreign language
 Third- and fourth-year history

5. Complete not less than 15 high school units with no grade lower than C in work taken in the ninth, tenth, eleventh, and twelfth years, or not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years; and pass the *Examination in Subject A*; and have grade A or B in the following subjects:

Plane geometry, 1 unit
 Second-year foreign language, 1 unit
 Third- or fourth-year laboratory science, 1 unit
 Requirement (f), 1 unit.

Preparation for Curricula in Agriculture

In addition to those subjects required for admission to the University, certain preparatory subjects are recommended for each University curriculum which, if included in the high school program, will give the student a more adequate background for his chosen field of study.

Students entering the College of Agriculture will be seriously handicapped in undertaking the lower division courses required in the various curricula of this College unless they have completed, in addition to those subjects required for admission, the following subjects in high school: algebraic theory,

½ or 1 unit; trigonometry, ½ unit; physics, 1 unit; chemistry, 1 unit; and, for those proposing to major in landscape design, agricultural engineering, or forestry, geometrical drawing, 1 unit.

ADMISSION BY EXAMINATION

The University of California does not itself offer entrance examinations, but accepts on all campuses the results of examinations given by the College Entrance Examination Board.

Information about dates and places of examination may be secured from the Admissions Office or from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey, or P. O. Box 775, Berkeley, California. Definite arrangements to take the tests must be made with the Board at least four weeks previous to the date of the tests. If the applicant has completed all of the subjects in the (a) to (f) list with grades of C or better, but is deficient in the scholarship average, he may clear his admission requirements by a satisfactory score on the Scholastic Aptitude Test and on three achievement tests in subject fields. If the (a) to (f) list of subjects has not been completed with grade of C or better, the applicant should consult the Admissions Office in regard to the tests he must take.

ADMISSION OF RETURNING MEMBERS OF THE ARMED FORCES

Some exceptions in the subject requirements for admission will be made for men and women who were for at least one year members of the armed forces of the United States in World War II. Such exceptions will apply, however, only when the scholarship record is high enough to indicate probable success in the University. Veterans whose scholastic records are good, and whose high school subject deficiencies total not more than 3 units, are encouraged to make application, even though they may not have all of the usual requirements. A veteran with a good scholarship record but with subject deficiencies will be classified as a special student until deficiencies are removed, or until all of the requirements for junior standing in the college of his choice have been completed.

REMOVAL OF ADMISSION DEFICIENCIES

Deficiencies in high school scholarship or subject requirements must be removed by examination or additional studies before admission is approved. The applicant whose only deficiency arises from not having studied a required subject may remove the deficiency by a satisfactory grade in a course acceptable for that purpose, and by maintaining a satisfactory scholarship average in other studies pursued in the meantime. The applicant whose deficiency is caused by a low scholarship average or by a combination of low scholarship and incomplete subject preparation, may remove his deficiencies as follows:

1. By college courses of appropriate content and amount completed with satisfactory scholarship in junior colleges, or state colleges of California, or

in other approved colleges. The applicant must include in his program courses acceptable for removing his subject shortages and present either:

- (a) Sixty units with at least an average of grade C in college transfer courses, or
- (b) a minimum of fifteen units of college transfer courses with a grade-point average of 1.5

Ordinarily, it is recommended that graduates of California high schools who are not eligible for admission to the University attend one of the California junior colleges and complete there the lower division requirements of the college in which they wish to register.

2. By college courses in one of the three following divisions of the University of California:

- (a) *University Extension*. These courses are of three types—correspondence; general adult education classes marked “X,” “XB,” or “XL”; and special classes designed to make up entrance deficiencies. There are no restrictions on enrollment in correspondence courses, but only those with 5 units or less of scholarship deficiencies in their high school records are eligible for the special program of class courses designed to make up entrance deficiencies. To be acceptable, grades received in this program must be definitely above the C average, and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.
- (b) *Combination Program of the College of Agriculture at Davis*. For high school graduates with not more than three matriculation deficiencies, a combination program is offered at the College of Agriculture of the University of California, Davis. These three matriculation deficiencies may be entirely subject shortages, entirely scholarship deficiencies, or a combination of both. A grade of D or F on high school transcripts shall count as both a scholarship and a subject deficiency. Students cannot remove entrance deficiencies in the Two-Year Curricula (non-degree courses).
- (c) *Summer Session*. For students with only one or two deficiencies, the first summer session of the University may be used to make up shortages. Courses taken in the second summer session may not be used to make up deficiencies for entrance to the fall semester immediately following.

3. By postgraduate courses in accredited high schools.

4. By College Entrance Examination Board Examination (refer to “Admission by Examination,” page 55).

5. As an alternative to making up high school subject deficiencies, the Board of Admissions and Relations with Schools has approved an experimental plan of admission, limited to the years 1949–1953 inclusive. Under this plan an applicant may be admitted on the basis of a record showing completion of at

least 60 units of C-average work, in which must be included all of the subjects required for junior standing in the College of the University for which application is made.

ADMISSION IN ADVANCED STANDING BERKELEY, DAVIS, LOS ANGELES CAMPUSES

An applicant for admission to the University in advanced standing must present evidence that he has satisfied, through either high school or college courses, the subjects and scholarship required for admission of high school graduates in freshman standing (see sections on admission from high school and on removal of admission deficiencies), and that advanced work in institutions of college level has met the minimum scholarship standard required of transferring students (namely, an average of grade C or higher in all college courses undertaken).

As an integral part of the system of public education of California, the University of California accepts at full value academic courses completed with satisfactory grades in the public junior colleges of the State; students who intend to complete their advanced studies at the University will frequently find it to their advantage to complete the first two years of their college course in one of the many excellent California public junior colleges.

An applicant may not disregard his college record and apply for admission in freshman standing; he is subject without exception to the regulations governing admission in advanced standing. He should ask the registrars of all preparatory schools and colleges he has attended to forward complete official transcripts directly to the University Admissions Director. A statement of honorable dismissal from the last college attended must also be sent.

REMOVAL OF SCHOLARSHIP DEFICIENCIES BY APPLICANTS FROM OTHER COLLEGES

Applicants otherwise eligible who seek to transfer from other institutions of collegiate rank, but whose college records fail to show a satisfactory scholarship average, may be admitted only when the deficiency has been removed by additional work, completed with grades sufficiently high to offset the shortage of grade points. This may be accomplished by work in other approved higher institutions, in summer sessions, or in correspondence courses in University Extension. Except for veterans, applicants for advanced standing who have scholarship deficiencies will not be admitted to the admissions program classes of University Extension.

ADMISSION OF SPECIAL STUDENTS

Special students are students of mature years who have not had the opportunity to complete a satisfactory high school program, but who, by reason of special attainments, may be prepared to undertake certain courses in the Uni-

versity. The conditions for the admission of each applicant under this classification are assigned by the University Admissions Director. Ordinarily, a personal interview is required before final action can be taken and, in general, special students are required to confine their attention to some special study and its related branches.

Transcripts of records from all schools attended beyond the eighth grade must be submitted. An applicant for special status may be required to take an aptitude test and the *Examination in Subject A*. The University Admissions Director will supply, upon request, the forms of application for admission and for transcript of high school record.

No person under the age of 21 years will be admitted as a special student, but the mere attainment of any given age is not in itself a qualification for admission.

An applicant will not be admitted directly from high school to the status of special student. Graduates of high schools are expected to qualify for admission in accordance with the usual rule; students so admitted, if not candidates for degrees, may, with the approval of the proper study-list officer, pursue elective or limited programs.

The University has no "special courses"; all courses are organized for regular students. A special student may be admitted to those regular courses for which, in the judgment of the instructor, he has satisfactory preparation. *A special student will seldom be able to undertake the work of the engineering and professional colleges or schools until he has completed the prerequisite subjects.*

A special student may at any time attain the status of regular student by satisfying all the matriculation requirements for admission to the University, but an applicant will not be admitted to special status for the purpose of making up requirements.

ADMISSION FROM SCHOOLS AND COLLEGES IN FOREIGN COUNTRIES

The credentials of an applicant for admission from a foreign country, either in undergraduate or graduate standing, are evaluated in accordance with the general regulations governing admission. An application and official certificates and detailed transcripts of record should be submitted to the University Admissions Director several months in advance of the opening of the semester in which the applicant hopes to gain admittance. This will allow time for exchange of necessary correspondence relative to entrance and, if the applicant is admitted, be of assistance to him in obtaining the necessary passport visa.

An applicant from a foreign country whose education has been conducted in a language other than English may be admitted only after demonstrating that his command of English is sufficient to permit him to profit by instruction in this University. An applicant's knowledge of English is tested by an oral and

written examination. This regulation applies to both graduate and undergraduate foreign students. The admission of an applicant who fails to pass this examination will be deferred until such time as he has acquired the required proficiency in the use of English.

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

Special advisers have been appointed by the President of the University to assist foreign students in all matters pertaining to their attendance at the University. Every student from another country is urged, upon his arrival at the University, to consult Foreign Student Advisers: Mr. Allen C. Blaisdell, International House, Berkeley; or Mr. Clifford H. Prator, 232 Administration Building, University of California, Los Angeles.

ADMISSION IN GRADUATE STANDING

Holders of bachelors' degrees (representing the usual college course of four years) from institutions on the Accepted List of the Association of American Universities will be admitted to the Graduate Division of the University of California, Berkeley, upon presentation of credentials including a diploma or certificate of graduation, with the proviso that the University of California may deny admission to graduate status in cases where the undergraduate program has not been of such character as to provide an adequate basis for advanced work leading to academic or professional higher degrees or certificates. This applies to colleges within the University of California as well as to those outside.

Applicants for admission to graduate work at the College of Agriculture at Davis must first secure admission to the Graduate Division and authorization to pursue such work through the Dean of the Graduate Division, Northern Section, Berkeley. *In the absence of a diploma or other official evidence of graduation or degree, registration will not in any case be permitted.*

The Accepted List of the Association of American Universities is printed in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION. Graduates of institutions not on this list may be admitted to the Graduate Division with the approval of the Dean of the Graduate Division if the evaluation of their certified college records by the University Admissions Director proves them eligible for graduate status. Every applicant for admission to the Graduate Division is required to pay an application fee of \$5 at the time the application is presented.* Remittance should be made payable to The Regents of the University of California.

The level of work to which graduate students are assigned, and their stand-

* Veterans who expect to enroll under the provisions of Public Law 16 or Public Law 346 are not required to remit this fee with their applications; if the applicant is accepted and registers in the University, the fee will be paid by the government.

ing as candidates for degrees, depends upon the extent and character of their undergraduate courses. If in any department the preliminary training of an applicant has not been sufficient to qualify him for graduate work, he may be admitted to such undergraduate courses as may be suited to his needs.

Applicants for admission to the Graduate Division on credentials from universities and colleges in foreign countries may be admitted only after demonstrating, in the examination in English for foreign students described in the preceding section, that their command of English is sufficient to permit them to profit by instruction in this University.

For information concerning all matters pertaining to the Graduate Division, Northern Section, including the list of available fellowships and graduate scholarships, and the requirements for all higher degrees and certificates see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be obtained upon application to the Dean of the Graduate Division, University of California, Berkeley 4, California.

For regulations concerning graduate study at Los Angeles consult the ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION, which may be obtained upon request from the Dean of the Graduate Division, University of California, Los Angeles 24, California.

ENROLLMENT RESTRICTION

Within the limits of its capacity, the University of California ordinarily makes no restriction on admission of applicants from areas outside of California. For the year 1949-1950, however, it is necessary to restrict enrollment in the Colleges of Engineering in the freshman, sophomore, and junior years to bona fide residents of California. In the other colleges there will be no restriction on admission in the junior and senior classes other than the regular requirements for admission to the University, but enrollment in the freshman and sophomore classes will be restricted to applicants of exceptional promise (the upper half of applicants ordinarily eligible). Such applicants must submit, in addition to scholastic records, a properly certified standing on either the College Entrance Examination Board Scholastic Aptitude Test or the American Council on Education Psychological Examination. There are special limitations concerning nonresidents in certain of the professional schools.

SUBJECT A: ENGLISH COMPOSITION

The University requires that every accepted student pass an examination in English composition, or complete in college a course in English composition with a satisfactory grade. Students who enter the University with credentials showing the completion elsewhere of the required training in composition, or with a satisfactory score in the College Entrance Examination Board Achievement Test in English Composition, are considered to have met the Subject A requirement. An examination by this University is required of all other students.

AMERICAN HISTORY AND INSTITUTIONS

All students who are candidates for the bachelor's degree must demonstrate a knowledge of American History and Institutions and may meet the requirement in the following ways:

1. By passing a single examination in American History and Institutions. Passing this examination will not entitle the student to receive unit credit.

2. By completing any two of the following courses:* American Institutions 101 (Summer Session), or XB7ABC or X7AB (University Extension); Business Administration 155; Economics 113, 150B; History 17A, 17B, or XB17A, XB17B (University Extension), 167A, 167B, 172A, 172B, 173A, 173B, 174A, 174B, 176A, 176B, 187A, 187B; Political Science 1, XB1 (University Extension), 113, 115, 119, 128, 140, 150, 151, 152, 154, 155, 157A, 157B, 159, 162, 172, 175, 182; Speech 137. Any one of these courses offered in the Summer Sessions is acceptable.

3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California in those cases where an official transcript of record from such an institution indicates satisfaction of the requirement by such courses.

(b) By presenting a certificate of completion of acceptable courses at other collegiate institutions. Certificates may be obtained from the office of the Supervisor.

For further information regarding this requirement, and examination necessary to meet it, see the Supervisor of the Requirement of American History and Institutions.

CLASSIFICATION OF STUDENTS AT DAVIS

For administrative purposes, undergraduate students on the Davis campus are classified into four groups on the basis of their academic preparation or their professional and vocational objectives:

GROUP I. *Four-year students seeking the bachelor's degree.* All students who have fulfilled the entrance requirements of the University of California and are pursuing courses leading to the bachelor's degree are given this classification.

GROUP II. *Students with matriculation deficiencies who wish to qualify for regular standing in the University of California.* This group includes high school graduates who have minor matriculation deficiencies. For further details, see pages 55-56.

GROUP III. *Students in the Two-Year Curricula in Agriculture.* High school graduates and qualified persons more than 18 years of age who are not high

* These courses are offered at Berkeley. Students at Los Angeles should consult the GENERAL CATALOGUE for that campus.

The following courses are offered at Davis: History 17A, or 171A, or XB17A (University Extension); History 17B, or 171B, or XB17B (University Extension); History 174B; Political Science 113, 151.

school graduates but who are registered for a two-year major-subject program leading to the Certificate of Graduation are placed in this group.

GROUP IV. *Special students*. Students in this classification are mature persons who have not had the opportunity to complete a satisfactory high school program, but who may be prepared to undertake certain courses in the University. For further details, see page 57. Such persons may also register at Davis as "visitors" and be granted special privileges for a brief period of intensive study with some member of the staff. Visitors pay a fee of \$3 for the first week and \$2 for each additional week of residence. They must have their applications endorsed by the staff member with whom they plan to study and approved by the Assistant Dean, College of Agriculture, Davis. Except for conduct, visitors are not held to the same academic regulations as regular students. They may use the Library, but not the Student Health Service.

REGISTRATION AT DAVIS*

The prospective student should plan to arrive in Davis by Monday of registration week. Formal registration should be completed by Friday afternoon. All new students may be required to take certain tests, including the examination in Subject A, which are scheduled for specific hours on Monday and Tuesday. A fee of \$1 is charged any student who fails to take the required examination at the prescribed time.

* For information regarding registration at Berkeley and Los Angeles, write to the Registrar's Office, University of California, Berkeley 4; or Registrar's Office, University of California, Los Angeles 24.

DEGREE OF BACHELOR OF SCIENCE IN THE COLLEGE OF AGRICULTURE

REQUIREMENTS

THE DEGREE OF Bachelor of Science is awarded to those candidates who:

1. Satisfy the general University requirements as follows:
 - (a) *Subject A.* The Subject A examination in English composition is required of every undergraduate student at the time of his first registration in the University.
 - (b) *Military or Naval Science* (for male students).
 - (c) *American History and Institutions.* The student may meet this requirement by the passing of an examination in American History and American Institutions or by the completion of courses prescribed by the University.
 - (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
 - (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.
2. Satisfy the general requirements of the College of Agriculture as follows:
 - (a) *At least 12½ units of University work.* Not more than 4 units may be in lower division physical education courses.
 - (b) *Thirty-six units of the above total in upper division courses* (courses numbered 100-199).
 - (c) *Nine units of mathematics including trigonometry.* Matriculation work may be offered toward this requirement, counting each year of high school work as 3 units. The student normally satisfies this requirement before the end of his sophomore year.
3. Satisfy the requirements of one of the curricula in the College of Agriculture.

CURRICULA

The student *must consult* his adviser each semester for guidance in following the curriculum requirements of his choice. No Associate in Arts degree is given in the College of Agriculture.

Program examples are shown for each curriculum. Students who are unable to meet the suggested outlines of study during the first two years may take some of the requirements in their junior or senior year. It should be noted, however, that any great departure from the recommended programs may delay graduation beyond the normal four-year period.

AGRICULTURAL ECONOMICS

Instruction in agricultural economics is intended to prepare the student for leadership in rural affairs. A wide choice of courses within the required fields is permitted. Thus, the student may obtain a broad university education without sacrifice of the training essential to successful raising, processing, and marketing of farm products. It is sought to foster in the student an ability to



Section of the Forestry Library, Berkeley campus

analyze the impact of economic forces upon general welfare, as well as upon the economic efficiency of the farm enterprise. There are three major fields in which graduates from this division are employed. Many engage in farming as proprietors or managers. Others are employed by commercial agencies, by agricultural marketing organizations, by handlers of farm products, materials, and equipment, or by farm credit agencies. Still others become teachers or obtain work with public agencies, such as the agricultural extension service, and state and federal agencies dealing with economic issues. Students who expect to become professional agricultural economists should complete one or more years of graduate work.

The headquarters of the division are at Berkeley. All of the graduate instruction and much of the undergraduate instruction are given on that campus. However, a number of undergraduate courses in agricultural economics are available at Davis and Los Angeles. Students majoring in this field are required to be in residence during two full consecutive semesters in the regular sessions at Berkeley in either their junior or senior year, preferably the latter. Most students will find it advantageous to spend both of these years there.

There are no formal subdivisions or major groups within the curriculum, although students are frequently permitted to develop various sub-fields by selecting desired courses within the required fields. Thus, emphasis may be laid upon production economics, land utilization, marketing, price analysis, taxation, finance, rural sociology, etc. Students may also emphasize either the plant or animal sciences. For example, a student interested in the management of a livestock enterprise could select science and agricultural courses in accordance with his interest and objectives. Students with general interests are permitted to select courses from several sciences, and the required 15 units in agricultural courses may be met by courses in several fields of agricultural production.

(a) Required:	Curriculum in Agricultural Economics	Units
	Bacteriology, botany, chemistry, geology, physics, physiology, zoölogy, or additional mathematics*	18
	*Mathematics	6
	English or speech	6
	Business administration or economics.....	15
	Anthropology, geography, history, philosophy, political science, psychology, or sociology and social institutions...	12
	Agriculture	15
		72

- (b) In addition to the above, every student must complete at least 15 units of upper division work in agricultural economics selected with the approval of the major adviser.

One course in statistics is required, but it may also be partial satisfaction of other requirements.

* This requirement is *not* satisfied by Mathematics 2 or mathematics courses designated by letters, such as Mathematics C or D.

Examples of Agricultural Economics Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A, 8	5	3	Business Administration		
Economics 1A-1B	3	3	1A-1B	3	3
English 1A-1B	3	3	Mathematics 3A-3B†	3	3
Zoölogy 10	3	..	Economics 2	..	3
Botany 12	..	4	Agricultural Economics 1	3	..
			Geology 1	3	..
			Animal Husbandry 7	..	3
			Elective	3	3
	16	15		17	17

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
English 1A-1B	3	3	Economics 1A-1B	3	3
Botany 1	5	..	Chemistry 1A-1B	5	5
Agronomy 1	3	..	Agricultural Engineering		
Animal Husbandry 7	3	..	12	..	2
Poultry Husbandry 1	..	3	Horticulture 2	3	..
Truck Crops 1	..	3	Mathematics 11A-11B	3	3
Elective	..	5			
	16	16		16	15

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science*	1½	1½	Military Science*	1½	1½
Physical Education	½	½	Physical Education	½	½
English 1A-1B	3	3	Economics 1A-1B	3	3
Botany 1	5	..	Business Administration		
Chemistry 2, 2A	3 or 5	..	1A-1B	3	3
Entomology 1	..	4	Mathematics 3A-3B†	3	3
Geography 5A-5B	3	3	Physics 10	..	3
Geology 2	..	3	Subtropical Horticulture 2	3	..
Elective	..	2	History 17A	..	3
			Elective	3	..
	16 or 18	17		17	17

† Mathematics 3A must be preceded by Mathematics D or 1, unless the student is excused by passing special examination.

* Or Naval Science (3 units per semester).

AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

This curriculum provides a broad agricultural training for students who desire a general course in agriculture. Two specializations or majors are available: (1) a major in agricultural education for those who intend to qualify for teaching agriculture in the high schools and junior colleges of the State, and (2) a major in general agriculture for students who desire preparation for occupations requiring training which may involve two or more major agricultural fields.

The basic requirements provide a good foundation in the physical and biological sciences and in English and economics, and include the necessary prerequisites for many courses in all of the major agricultural divisions. These general requirements include 52 units of course work. In addition to the basic preparation, introductory courses in animal husbandry, dairy industry, poultry husbandry, agronomy, truck crops, horticulture, and agricultural engineering and upper division courses in each of the major agricultural divisions are available to make up the 50 units of required work in agriculture.

Certain parts of the required curriculum may be completed at Berkeley or Los Angeles, but only on the Davis campus are all of the requirements offered. The lower division courses in this curriculum may also be completed in many of the junior colleges.

Majors

(1) *Agricultural Education*.—This major is designed specifically to provide the undergraduate preparation required for teaching agriculture in California high schools and junior colleges. It provides the preparation required for teaching vocational agriculture under the Smith-Hughes Act and for the special secondary credential in that subject, as well as for teaching general courses in agriculture and related science. (See "Graduate Study," page 102.)

State Department of Education requirements for the special vocational credential include the following:

1. Three years of farm experience or its equivalent.
2. Technical agriculture subjects totaling 60 units selected to insure that the minimum number of units are included in each of the following fields:

	<i>Minimum</i>	<i>Recommended</i>
(a) Plant and soil science.....	15	20
(b) Animal science.....	15	20
(c) Agricultural engineering and mechanics....	8	10
(d) Agricultural economics and rural sociology	6	10

Students who have not acquired the requisite farm experience should consult their major adviser for assistance in arranging for summer work.

There are two credentials which authorize the holder to teach general agriculture: the general secondary credential and the special secondary limited

credential. The special secondary limited credential authorizes the holder to teach the agricultural subjects named in the credential and requires 8 units of work in each of the subjects named. Because of especially favorable conditions for supervised practice teaching, afforded by the Los Angeles City School system, the Los Angeles campus offers excellent opportunities for students who desire to qualify for the special or limited general secondary credential. A special secondary credential in vocational agriculture entitles the holder to teach vocational agriculture in departments organized under the Federal and State Vocational Acts. Training for this credential is centered at Davis.

For requirements of the general secondary credential see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, Los Angeles or Berkeley.

(2) *General Agriculture*.—Among the occupations for which this major provides preparation are the following: farming, agricultural extension and farm advisory work, sales and service positions with firms which process and distribute agricultural products and equipment, and for positions with federal and state departments of agriculture.

The basic requirements are identical with those of agricultural education, but the 50 units of agriculture may be selected in terms of the training needed, provided the minimum requirements are met.

Curriculum in Agricultural Education and General Agriculture

(a) Required:	<i>Units</i>
Chemistry	13
Physics	6
Botany, zoölogy, and/or bacteriology	12
Soil science or geology	3
Genetics	4
Economics	6
English and/or speech	6
Business administration, sociology, history, political science, or additional economics	5
	<hr style="width: 10%; margin: 0 auto;"/> 55

(b) In addition, students must complete 50 units of work in agriculture selected with the approval of the major adviser, including at least 15 units of animal science, 15 units of plant science, 8 units of agricultural engineering, and 6 units of agricultural economics.

Certain courses are required by the following majors:

Agricultural Education.—Psychology 1A or an equivalent course and Education 160 are required in this major.

Soils 106 or an equivalent course in soils must be completed under requirement (a) or (b).

General Agriculture.—Soils 106 or an equivalent course in soils must be completed under requirement (a) or (b).

Examples of Agricultural Education Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Zoölogy 1A	4	..
Botany 1	5	..	Physics 2A-2B	3	3
English 1A .....	..	3	Economics 1A-1B	3	3
Horticulture 2	3	..	Poultry Husbandry 1	3	..
Animal Husbandry 7 .....	..	3	Bacteriology 2 .....	..	4
Elective .....	..	3	Chemistry 8 .....	..	3
	—	—		—	—
	15	16		15	15

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Botany 1 .....	..	5
Animal Husbandry 7	3	..	Physics 2A-2B	3	3
Animal Husbandry 8	1	..	Economics 1A-1B	3	3
Zoölogy 1A	4	..	Bacteriology 2	4	..
Poultry Husbandry 1 .....	..	3	Chemistry 8	3	..
Truck Crops 1 .....	..	3	Horticulture 2	3	..
Elective .....	..	3	Elective .....	..	3
	—	—		—	—
	15	16		18	16

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
*Military Science	1½	1½	*Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
Bacteriology 1 .....	..	4	Chemistry 8 .....	..	3
Botany 1	5	..	Economics 1A-1B	3	3
Chemistry 1A-1B	5	5	Physics 2A-2B	4	4
English 1A	3	..	Zoölogy 15	5	..
Political Science 1	3	..	Subtropical Horticulture 2, 110	3	2
History 7A .....	..	3	Psychology 21 .....	..	8
Speech 1A .....	..	3		—	—
	—	—		17	17
	18	17			

* Or Naval Science (3 units per semester).

ANIMAL SCIENCE

The animal science curriculum is designed to train men in the fundamentals of animal production, including the handling and processing of animal products. It thus covers a very broad field. The courses include the physical and biological sciences, with English and economics, in a general requirement of 67 units listed below.

This is followed by a wide range of specialization in the upper division work between and within the majors involved—animal husbandry, genetics, and poultry husbandry.

Graduates are fitted to enter a variety of animal production and technical fields, including general agriculture. They may also become teachers and investigators, or proceed with graduate work in genetics, nutrition, agricultural chemistry, and physiology, or complete the course in veterinary medicine.

Majors

Animal Husbandry.—Instruction in animal husbandry deals with the basic sciences and their application to livestock husbandry, with special reference to conditions in California. This major is offered on the Davis campus.

The division has developed herds and flocks of several breeds of each species of livestock of economical importance. These are used for student instruction in breeding, feeding, management, and judging.

Nutrition, physiology, genetics, and wool laboratories, a respiration chamber and a psychrometric room for large animals, and a small animal colony are provided in the Animal Science Building. The Davis divisions of Zoölogy and Entomology and Parasitology have their laboratories in the same building, and with the Department of Veterinary Science coöperate closely in research and teaching with the Animal Husbandry Division.

Genetics.—The principles of genetics are the same in plants and animals (see "Plant Science," page 87), but mathematical and statistical methods play an especially important role in the improvement of domestic animals by selective breeding. Students who intend to specialize in the genetics of farm animals should therefore obtain an adequate mathematical background for the study of modern statistical methods.

Poultry Husbandry.—Courses in this major present the applications of scientific knowledge to commercial poultry production. Special emphasis is placed upon the methods of poultry husbandry practiced in California and other western states.

The introductory course consists of a survey of the poultry industry in the United States, including the application of the several sciences which contribute methods used in poultry husbandry. Laboratory instruction deals with the biology of the fowl, culling and selection, poultry products, and flock management. Advanced courses in the application of genetics, biochemistry, and embryology to poultry production provide a review of knowledge regard-

ing successful methods of breeding, feeding, and incubation, as well as the basis for the experimental solution of problems in these fields. Special studies are designed to be taken by advanced undergraduates or graduates and provide opportunities to become acquainted with experimental methods; they involve work dealing with some form of poultry or poultry products elected by the student.

This major prepares students for the various kinds of commercial poultry farming, for service or production work with poultry breeders, hatcheries, and feed manufacturing firms, and for positions with organizations dealing with poultry products or supplies. Students with good scholarship and sound fundamental training are eligible for employment in federal, state, or commercial experimental work, and in agricultural extension services. Excellent opportunities exist for men in graduate study in fields related to poultry husbandry.

The facilities of the division include poultry plants and laboratories at Davis and Berkeley. All work with turkeys is conducted at Davis. Students in this major should spend the last year, at least at the present time, on the Berkeley campus in order to obtain certain courses required by the major.

Curriculum in Animal Science

(a) Required:	<i>Units</i>
Chemistry, including biochemistry	16
Botany	4
Physics	6
Economics	6
Zoölogy	10
Genetics	4
Bacteriology	4
Geology or soils	3
Animal physiology	5
Animal nutrition	3
Animal pathology or parasitology	3
English	3
	67

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following divisions, or in a closely related division, selected with the approval of the major adviser: animal husbandry, poultry husbandry, and genetics.

Certain courses are required by the following majors:

Animal Husbandry: Animal Husbandry 7, 8, 102, and 103 are required in this major. Animal Husbandry 103 satisfies the animal nutrition requirement. Animal Husbandry 101 or Poultry Husbandry 106 are required but may be counted as part of the 16 chemistry units required of all students. Chemistry 1A, 1B, and 8 are required in these 16 units.

Poultry Husbandry: Majors in this subject are required to take Poultry

Husbandry 1. Either Poultry Husbandry 106 or Animal Husbandry 101 should be taken as part of the curricular requirements in biochemistry. Poultry Husbandry 104 will satisfy the animal nutrition requirement.

Examples of Animal Science Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Chemistry 8	3	..
Physics 2A-2B	3	3	Botany 1	..	5
English 1A	..	3	Physiology 1	3	..
Geology 1	3	..	Physiology 1L	2	..
Poultry Husbandry 1	3	..	Zoölogy 1A-1B	4	4
Elective	..	3	Bacteriology 2	..	4
			Economics 1A-1B	3	3
	16	16		17	18

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Zoölogy 1A-1B	4	4	Chemistry 8	3	..
Chemistry 1A-1B	5	5	Animal Husbandry 101 and 102*	..	3 to 5
English 1A	3	..	Bacteriology 2	4	..
Geology 1	..	3	Economics 1A-1B	3	3
Animal Husbandry 7 and 8* or elective	4 or 3	..	Physics 2A-2B	3	3
Poultry Husbandry 1 or elective	..	3	Botany 1	..	5
	18 or 17	17	Zoölogy 100A* or elective.2 or 3	..	..
				17 or 18	16 to 18

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military or Air Science†	1½	1½	Military or Air Science†	1½	1½
Physical Education	½	½	Physical Education	½	½
Bacteriology 1	..	4	Chemistry 8	..	3
Botany 1	5	..	Economics 1A-1B	3	3
Chemistry 1A-1B	5	5	Zoölogy 15	5	..
Geology 2	..	3	Physics 2A-2B	4	4
Zoölogy 1A-1B	4	4	Elective	3	3
	16	18		17	15

* Required of animal husbandry majors only.

† Or Naval Science (3 units per semester).

ENTOMOLOGY AND PARASITOLOGY

The curriculum in this division is organized to furnish the basic training for students planning to make a career of one of the phases of entomology and parasitology, and to serve the needs of students in the general fields of biology and agriculture. The fundamental background is intended for those individuals planning to engage in research, teaching, public service, or in the many commercial fields of the numerous phases of entomology and parasitology. Careers are open for graduates of the four-year curriculum with private, municipal, county, state, and federal agencies employing entomologists and quarantine officers, public health specialists, inspectors, and technicians; and as pest control operators. Professional positions on the higher levels in college teaching and in experiment station work, as well as research with commercial organizations, usually require additional training which is obtained in a minimum of from one to three years of graduate study leading to a higher degree. (See ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION.)

The courses offered enable the student to specialize in several principal fields of entomology and parasitology as follows:

Medical and Veterinary Entomology and Parasitology.—The noxious insects and parasites which torment and transmit diseases of human beings and domesticated animals.

Economic Entomology.—Study of the insects which attack agricultural crops, their life histories, mode of injury, economics, distribution, and methods of control.

Insect Toxicology.—The field of entomology dealing chiefly with the chemistry of insecticides: their uses and modes of action on insects and plants.

Insect Vectors of Plant Diseases.—Study of insects which are responsible for the transmission and causation of plant virus diseases involving field and greenhouse work, and the methods of insect transmission of the diseases and their control.

Forest Entomology.—Study of insects affecting forest trees, shade trees, and ornamentals, and their control.

Systematic Entomology.—Phylogeny, classification, nomenclature, and identification of insects.

Insect Anatomy and Physiology.—A study of the external and internal organs of insects and their functions.

Insect Pathology.—The diseases of insects and their relation to insect rearing and control.

Insect Ecology.—The relation of insects to climates and to their natural and artificial environments.

Biological Control.—The effects of insects and other parasites, predators, and destroyers of insects and weed pests, under natural and artificial conditions.

Insects and Wildlife Conservation.—Study of insects of importance as food of game birds, fishes, and other animals.

Apiculture, or Beekeeping.—The life history, practical handling, and the agricultural importance of the honeybee. This course is given at Davis.

Plant Nematology.—Symptomatology, pathology, and control of nemie infections in cultivated crops.

The subject matter presented in the courses in medical, veterinary, and economic entomology, forest entomology, insect toxicology, and others, satisfy certain of the requirements of students majoring in plant and animal sciences, public health, or agricultural chemistry.

While it is possible for the student to take the basic courses of the freshman and sophomore years at Davis or Los Angeles, he must spend three to four semesters at Berkeley to complete the requirements of the division.

Students unable to satisfy the curriculum requirements and those interested mainly in inspection, quarantine, and regulatory work should consult the ANNOUNCEMENT OF THE TWO-YEAR CURRICULA IN AGRICULTURE.

Curriculum in Entomology and Parasitology

(a) Required:	Units
Chemistry	13
Agriculture and/or forestry, other than entomology and parasitology	6
Botany and zoölogy	20
Bacteriology	4
Mathematics* and/or physics	6
English and/or speech	6
Genetics	3
Plant or animal physiology or nutrition or biochemistry....	3
Plant or animal pathology	4
Geography, geology, or paleontology	3
	68

(b) In addition to the above, every student shall complete a summer practice course in entomology and parasitology (course 49).

(c) In addition to (b) above, students must complete at least 23 units of courses in entomology and parasitology. (Courses 1, 106, 112, and 127 should be included.)

* Analytic geometry and calculus, statistics, or biometry.

Examples of Entomology and Parasitology Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Zoölogy 1A-1B	4	4
Botany 1	5	..	Entomology 1	4	..
English 1A-1B or Speech 1A-1B	3	3	Chemistry 8 .....	..	3
Elective .....	..	4	Physics 10	3	..
	—	—	Bacteriology 2 .....	..	4
	15	14	Elective	3	3
	—	—		—	—
	15	14		16	16

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Entomology 1 .....	..	4
English 1A-1B	3	3	Chemistry 8	3	..
Zoölogy 1A-1B	4	4	Bacteriology 2	4	..
Elective	3	3	Physics 2A .....	..	3
	—	—	Botany 1 .....	..	5
	17	17	Agronomy 1	3	..
	—	—	Elective	3	3
	17	17		—	—
	17	17		15	17

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
*Military Science	1½	1½	*Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
Botany 1, 3	5	4	Chemistry 8	3	..
Chemistry 1A-1B	5	5	Entomology 1 .....	..	4
English 1A-1B or Speech 1A-1B	3	3	Subtropical Horticulture 2	3	..
Physics 10	3	..	Bacteriology 1 .....	..	4
Electives .....	..	3	Zoölogy 1A-1B	4	4
	—	—	Electives	5	3
	18	17		—	—
	18	17		17	17

* Or Naval Science (3 units per semester).

FOOD SCIENCE

The curriculum in food science is intended to prepare students for service and leadership in the food processing industries—dairy industry, enology, and food technology. The courses include the physical and biological sciences with English and economics in a general requirement of at least 62 units, as mentioned below, followed by intensive specialization in the upper division work between and within the majors involved.

Several lines of specialization are open to the student. Graduates are fitted for a career in plant operation and the handling of milk, fresh fruits, or vegetables intended for processing, in chemical research and control, or in the economic and business side of the food processing industries. Many graduates are engaged in creameries, wineries, breweries, canneries, freezing plants, dried fruit packing plants, and other food plants. Some have followed the plant operation, managerial, or sales phases of the food industries. Others are engaged in research or teaching in various universities and experiment stations and in Federal research and food inspection laboratories. The student may also pursue graduate work to fit him more particularly for one of these fields.

Majors

No formal subdivisions have been made in the curriculum; but with the approval and advice of his faculty adviser, a student may plan a curriculum leading to specialization in one of the following majors:

Dairy Industry.—Instruction in this major is offered in the principles and art of manufacturing dairy products for the student who wishes to enter dairy manufacturing or dairy farming; to prepare for positions as operator, manager, or inspector of dairy farms, creameries, cheese factories, or city milk and ice-cream plants; or to become a farm advisor, a teacher in high school or agricultural college, a technician, or a research worker in an agricultural college.

The facilities of the Division of Dairy Industry at Davis consist of a modern dairy plant, with the latest types of equipment for dairy products manufacturing, and chemical, bacteriological, and testing laboratories. The dairy manufacturing is in daily operation: market milk is pasteurized, and butter, cheese, ice cream, condensed milk, and dried milk are processed regularly. This provides excellent opportunities for student instruction. Courses in dairy cattle production are given by the Division of Animal Husbandry, which maintains a well-equipped dairy barn and a herd representing the principal breeds of dairy animals.

Enology.—The Division of Viticulture on the Davis campus offers facilities for undergraduates and graduate work in enology. A vineyard of over 1,000 named varieties of wine grapes is maintained for instruction and research. The Enology Building, designed for teaching and investigation, provides chemical and microbiological laboratories, fermentation and conditioning

rooms, distilling equipment, and storage and aging cellars for research on wines and brandies. Classroom instruction is supplemented by actual field and cellar practice.

Students primarily interested in grape and raisin production will normally major in viticulture under plant science.

Food Technology.—The headquarters of the Division of Food Technology at present are at Berkeley; however, funds have been appropriated and plans prepared for a new Food Technology Building at Davis. When this is available, much of the applied instruction will be given there.

The division's laboratories afford facilities for instruction and research in the application of chemistry, physics, and microbiology to the manufacture, utilization, and preservation of fruits and vegetables. Typical fields of advanced study include the microbiological and chemical factors involved in the preparation and preservation of canned, dried, and frozen foods; enzyme behavior and control; factors affecting corrosion of metals by food products; behavior and properties of the pigments of foods; the properties of and utilization of yeasts, lactic and acetic bacteria; the role of pH value in food processing and preservation, and the chemical changes in the freezing preservation of foods.

Curriculum in Food Science

(a) Required:	Units
Chemistry	19
Microbiology	8
Botany or zoölogy	5 or 3
Physics (including laboratory)	8
Biochemistry and/or physiology	6
Mathematics (including differential calculus)	6
Speech and/or English	6
Economics	6
	64 or 62

(b) Six units of course work in production fields of agriculture. A summer practice course may be required.

(c) In addition, every student must complete at least 20 units of courses in one of the following majors: dairy industry, enology, or food technology. A limited number of allied subjects, selected with the approval of the major adviser, may apply to this requirement.

Certain courses are required by the following majors:

Dairy Industry: Animal Husbandry 103, and 108; Chemistry 1A, 1B, 5, and 8; Dairy Industry 1, 2, 49, 160A, and 160B.

Enology: Agricultural Engineering 102; Botany 1 and 7; Chemistry 1A, 1B, 5, 8, and 101 or 111; Horticulture 2, 116, 105V, 130A, 130B, 120A, 120B, 140, and 141.

Food Technology: Bacteriology 1; Chemistry 1A, 1B, 5, 8, and 109; Food Technology 112, 113, 114, 115, and 127.

Examples of Food Science Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Physics 2A-2B	3	3
Botany 1	5	..	Physics 3A-3B	1	1
Speech 1A-1B	3	3	Chemistry 8, 5	3	3
Economics 1A	..	3	Bacteriology 1	..	5
Agricultural Engineering	..	..	Mathematics 8A-8B	3	3
12	..	2	Economics 1B	3	..
	<hr/>	<hr/>		<hr/>	<hr/>
	15	15		15	17

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Physics 2A-2B	3	3
Botany 1 or Dairy Industry 1 and 2	5 or 4	..	Physics 3A-3B	1	1
Mathematics 11A-11B	3	3	Chemistry 8, 5	3	3
*Zoology 10 or elective	..	3	Bacteriology 1	..	5
English 1A-1B	3	3	Economics 1A-1B	3	3
	<hr/>	<hr/>	Electives	3	..
	18 or 17	16		<hr/>	<hr/>
				15	17

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
†Military Science	1½	1½	†Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
Botany 1	5	..	Physics 2B	..	4
Chemistry 1A-1B	5	5	Chemistry 8, 5A	3	3
Mathematics 3A-3B	3	3	Subtropical Horticulture 2	3	..
Physics 2A	..	4	Bacteriology 1	..	4
English 1A-1B	3	3	Economics 1A-1B	3	3
	<hr/>	<hr/>	Zoology 1A	4	..
	18	17	Electives	2	..
				<hr/>	<hr/>
				17	16

FORESTRY

Although forestry is an old and well-known profession in Europe, it is one of the newer and smaller professions in this country. It has developed and expanded rapidly in recent decades. Foresters are now employed, not only by a

* Dairy industry students only.

† Or Naval Science (3 units per semester).

number of federal agencies including the Forest Service, the Park Service, the Bureau of Entomology and Plant Quarantine, the Soil Conservation Service, and the Grazing Service, but in increasing numbers by states, lumber companies, and cities and counties. However, the number of foresters recruited each year is comparatively small, and it is usually necessary for graduates to have several years of experience before they become rangers or are engaged in responsible forestry work for private companies.

The School of Forestry of the University of California now occupies the new Forestry Building on the Berkeley campus. Blodgett Forest, a 2,600-acre tract in the central Sierra Nevada, is the property of the School and serves as a research forest for faculty members and advanced students. The School also has a permanent summer camp in the Plumas National Forest where all undergraduates spend one summer in field practice work and instruction.

The preforestry work of the freshman and sophomore years is administered by the College of Agriculture. It is possible to complete the requirements for admission to the School of Forestry in the College of Agriculture on the Berkeley campus, the Los Angeles campus, the Davis campus, or at any junior college or four-year college offering the courses prescribed for the freshman and sophomore years.

Curriculum in Preforestry

(a) Required:	<i>Units</i>
Botany (general botany)	5
(This requirement is based on Botany 1 as given at Berkeley.)	
Chemistry (general inorganic and organic)	8
Engineering (plane surveying)	6
Economics (elements of economics)	6
Geology (structural)	3
Mathematics (analytic geometry and differential calculus)	6
Physics (general physics with laboratory)	8
Statistical methods	3
Zoölogy (general biology)	3
Speech, English, or philosophy	6
	54

(b) For admission to the School of Forestry, a student must have junior standing with at least 60 units of credit, including the prescribed subjects listed above, a grade average of C or higher, and have attended the summer forestry field practice courses, Forestry 49A-49B.

The schedule of study offers a broad basic training in the first four semesters. To complete his work for the degree of Bachelor of Science in the normal eight-semester period, the student should adhere closely to the recommended program, which follows. It enables him to complete the maximum number of lower division courses in an orderly manner and without conflicts. Much of this work is prerequisite to necessary courses in the School of Forestry, and by so following the recommended program the student is prepared to make an advan-

tageous selection of electives and a logical arrangement of requirements after his admittance to the School of Forestry.

Examples of Preforestry Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A, 8	5	3	Physics 2A-2B, 3A-3B....	4	4
Zoölogy 10 .....	..	3	†Botany 1	5	..
Geology 1	3	..	†Engineering 1A-1B	3	3
Speech 1A-1B or English 1A-1B	3	3	Economics 1A-1B	3	3
Mathematics 3A-3B	3	3	Statistics .....	..	3
	—	—		—	—
	16	14		17	15

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A	5	..	Chemistry 8	3	..
Botany 1	5	..	Physics 2A-2B, 3A-3B....	4	4
English 1A .....	..	3	Engineering 1A	3	..
Mathematics 11A-11B ...	3	3	Economics 1A-1B	3	3
Mathematics 13 .....	..	3	Speech 1A .....	..	3
Zoölogy 10 .....	..	3	Elective .....	..	3
Elective .....	..	2		—	—
	—	—		—	—
	15	16		15	15

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
*Military Science	1½	1½	*Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
Botany 1	5	..	Physics 2A-2B	4	4
Chemistry 1A .....	..	5	Economics 1A-1B	3	3
English 1A-1B or speech 1A-1B	3	3	Biology 12	3	..
Mathematics 3A-3B	3	3	Economics 2 .....	..	3
Engineering 1LA-1LB	2	2	Chemistry 10	4	..
Engineering 1FA-1FB	1	1	Geology 5 .....	..	4
	—	—		—	—
	16	16		16	16

† Students who prepare for forestry at other institutions which do not offer a one-semester course in general botany (equivalent to Botany 1) should take the year course (Botany 1A-1B or equivalent) usually with a total of 8 units of credit. This does not take the place of 4 units of plant physiology with laboratory (Botany 111).

† Trigonometry and geometrical drawing are prerequisite to Engineering 1A-1B, and should be taken in the high school.

* Or Naval Science (3 units per semester).

It is suggested that students interested in the study of forestry write to the School of Forestry, 243 Forestry Building, University of California, Berkeley 4, for the ANNOUNCEMENT OF THE SCHOOL OF FORESTRY for more detailed information.

HOME ECONOMICS

The Department of Home Economics was organized to serve the interests of family and institutional households. Its curriculum is designed to serve a two-fold purpose: to afford a liberal and balanced preparation for secondary schoolteachers of home economics, extension workers, and homemakers; and to provide specialized training for the professional fields which have developed out of general home economics. The first purpose is served by the major in general home economics; the second, by five other majors—child development, clothing and textiles, family economics, food chemistry and technology, and nutrition and dietetics.

Curriculum in Home Economics

(a) Required:	Units
Chemistry	8
Economics	6
Psychology	3
Bacteriology (including laboratory)	4
Physiology	3
Public health, botany, or zoölogy.....	3
English or speech.....	6
Statistics	3
	36

(b) In addition, 36 units of upper division work distributed among the allied fields of home economics and chosen with the approval of the major adviser. (This requirement is ordinarily satisfied by chiefly upper division courses in home economics.)

The required courses for each of the majors are as follows:

General Home Economics Major (this is the only major offered at Davis).—Home Economics 1A-1B, 6, 7, 112A-112B, 132 (or Psychology 112), 133, 140, 141 (or 142), 144, 162, 175; Decorative Art 16A-16B, 130A; Architecture 110. For the teaching credential (special secondary, general secondary, or junior college), the general home economics major is advised. A fifth year in graduate residence is also required in order to provide the necessary supervised teaching and other education courses. For details, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, BERKELEY.

Child Development Major.—Home Economics 1A-1B, 112A-112B, 132 (or Psychology 112), 133, 134 (or Public Health 121), 135, 435; Psychology 160, 162; Physiology 102. This major is intended for the student of child psychology and family relations, and for prospective nursery school and kindergarten teachers.

Clothing and Textiles Major.—Home Economics 6, 7, 141, 160, 162, 175, 176; Decorative Art 16A-16B, 175A-175B, 193A-193B. The major is designed for the training of specialists in textile economics and research, and costume design.

Family Economics Major.—Home Economics 6, 100, 140, 141, 142, 144, 162; 6 to 9 units of upper division economics or business administration selected upon consultation with the adviser. The family economics major is designed as preparation for social service, for consumer service in business or government, and for household equipment and management specialists.

Food Chemistry and Technology Major.—Home Economics 1A-1B, 100, 101A-101B, 114, 118A-118B, 141 (or Agricultural Economics 101A or Business Administration 123); Chemistry 1B; Biochemistry 103; Physiology 1L; 4 units of food technology courses. This major is recommended for those who wish to undertake laboratory testing and research in food manufacturing and distributing establishments or public health food inspection.

Nutrition and Dietetics Major.—Home Economics 1A-1B, 100, 101A, 114, 118A-118B, 141 (or Agricultural Economics 101A or Business Administration 123), 115; Chemistry 1B; Biochemistry 103; Physiology 1L. A year of graduate training is required also for the student who plans to earn the Certificate in Hospital Dietetics. This is open only to those with the major in nutrition and dietetics. Eight months of the graduate year are spent in supervised practice in the dietetic department of the University of California Hospital in San Francisco, or at another approved hospital, and one semester of graduate study on the Berkeley campus.

Examples of Home Economics Programs

Berkeley

General Home Economics

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Chemistry 1A, 8	5	3	Physiology 1	3	..
English 1A-1B or Speech 1A-1B	3	3	Home Economics 1A-1B	3	3
Public Health 5A or Zool- ogy 10	3	..	Economics 2 or Psychol- ogy 5	..	3
Decorative Art 16A-16B	2	2	Economics 1A-1B	3	3
Bacteriology 2	..	4	Home Economics 6, 7	3	3
Home Economics 12	..	..	Psychology 1A	3	..
Elective	..	4	Elective	..	4
	15	16		15	16

Child Development

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Chemistry 1A, 8	5	3	Physiology 1	3	..
English 1A-1B or Speech 1A-1B	3	3	Home Economics 1A-1B..	3	3
Public Health 5A	3	..	Economics 1A-1B	3	3
Bacteriology 2 .....	..	4	Psychology 1A	3	..
Zoölogy 10 .....	..	3	Psychology 5 or Economics 2 .....	..	3
Home Economics 12	2	..	Elective	4	7
Elective	3	3			
	—	—		—	—
	16	16		16	16

Clothing and Textiles

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Chemistry 1A, 8	5	3	Physiology 1	3	..
English 1A-1B or Speech 1A-1B	3	3	Economics 1A-1B	3	3
Botany 12 .....	..	4	Economics 2 or Psychol- ogy 5 .....	..	3
Decorative Art 16A-16B..	2	2	Home Economics 6, 7 ...	3	3
Bacteriology 2 .....	..	4	Psychology 1A	3	..
Home Economics 12	2	..	Elective	4	7
Elective	4	..			
	—	—		—	—
	16	16		16	16

Family Economics

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Chemistry 1A, 8	5	3	Physiology 1	3	..
English 1A-1B or Speech 1A-1B	3	3	Economics 2 .....	..	3
Public Health 5A or Zoölogy 10	3	..	Economics 1A-1B	3	3
Bacteriology 2 .....	..	4	Home Economics 6 .....	..	3
Home Economics 12	2	..	Psychology 1A	3	..
Elective	3	6	Elective	7	7
	—	—		—	—
	16	16		16	16

Food Chemistry and Technology or Nutrition and Dietetics

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Chemistry 1A, 8	5	3	Physiology 1, 1L	5	..
English 1A-1B or Speech 1A-1B	3	3	Home Economics 1A-1B	3	3
Public Health 5A	3	..	Economics 1A-1B	3	3
Bacteriology 1 or 2	..	4 or 5	Psychology 1A	3	..
Physics 2A-2B	3	3	Chemistry 1B	..	5
Home Economics 12	2	..	Economics 2 or Psychol- ogy 5	..	3
Elective	..	2 or 3	Elective	2	2
	<hr/> 16	<hr/> 16		<hr/> 16	<hr/> 16

Example of General Home Economics Program

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Chemistry 1A	..	5	Chemistry 8	3	..
English 1A-1B	3	3	Home Economics 1A-1B	3	3
Decorative Art 16A-16B	2	2	Home Economics 6, 7	3	3
Zoölogy 10	..	3	Economics 1A-1B	3	3
Mathematics 13	3	..	Bacteriology 2	4	..
Psychology 1A	3	..	History 17B	..	3
Elective	5	3	Elective	..	3
	<hr/> 16	<hr/> 16		<hr/> 16	<hr/> 15

LANDSCAPE DESIGN

Landscape design is the art of land planning for human use and enjoyment, and, as one of the recognized planning professions, calls for a high degree of technical training for its successful practice.

The curriculum is intended to prepare students for the professional practice of landscape architecture in all its varied phases, and students should expect to devote at least five years to technical preparation, followed by a period of practical experience in the field, and European study and travel if possible.

Most landscape architects engage in private practice, but many find employment in the offices of other landscape architects or on a salary basis with local and federal government agencies.

First-year prerequisites to courses in the landscape design curriculum may be taken on the Berkeley or the Los Angeles campus, or at many junior colleges. Students should plan to register on the Berkeley campus at the beginning of their sophomore year.

Curriculum in Landscape Design

(a) Required:	<i>Units</i>
General botany	4 or 8
English or speech	6
*Art and architecture	27
Economics	6
Civil engineering (surveying)	3
Social institutions, history, philosophy, or political science..	6
Engineering (other than surveying), geology, mathematics or agriculture (other than landscape design)	6
	58 or 62

(b) In addition to the above, students must complete a summer practice course, Landscape Design 49.

(c) In addition to (b) above, students must complete at least 30 units of courses in landscape design, with the approval of the major adviser. (The following landscape design courses should be included: 1A, 1B, 101A, 101B, and 114A or 114B.)

Examples of Landscape Design Program

FRESHMAN YEAR			Berkeley	SOPHOMORE YEAR		
<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>		<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2		Military Science	2	2
Botany 12 .....	..	4		Architecture 4 .....	..	4
Art 2A-2B or Decorative Art 16A-16B	2	2		Architecture 12	1	..
English 1A-1B or Speech 1A-1B	3	3		Architecture 18	1	..
Architecture 1, 2	3	3		Engineering 21 .....	..	3
Economics 1A-1B	3	3		Art 2A or Decorative Art 16A	2	..
Elective	3	..		Landscape Design 1A-1B.	3	3
				Landscape Design 2.....	2	..
				History 17A-17B	3	3
				Elective	3	2
	16	17			17	17

* Decorative Art 16A, 16B, 60A, 60B, 160A, 160B, and 166 may be accepted in partial fulfillment of this requirement, with consent of adviser.

University of California

Los Angeles

FRESHMAN YEAR*		
Course	Fall Units	Spring Units
†Military Science	1½	1½
Physical Education	½	½
English 1A-1B or Speech		
1A-1B	3	3
Art 2A-2B	2	2
Art 1A-1B	2	2
Botany 1, 3	5	4
Geology 2	3	..
Engineering 1LA . . . . .	..	2
Engineering 1FA . . . . .	..	1
	—	—
	17	16

The student should consult his major subject adviser concerning the 30 units of work required in landscape design and also his choice of elective units.

According to his needs, the student may elect courses in architecture, engineering, English, economics, graphic art, and the sciences.

The schedule for the junior and senior years is determined with the advice and consent of his major adviser.

PLANT SCIENCE

The plant science curriculum is designed to turn out well-trained men and women in plant production, including the handling and certain phases of the processing of plant products, and also to lay a good foundation for future specialization in graduate study. The course includes the physical and biological sciences, with English and economics, in a general requirement of 65 units as listed on page 90.

A wide range of specialization is offered in the upper division work between and within the majors involved, including agronomy, genetics, general horticulture, irrigation, ornamental horticulture, plant pathology, pomology, subtropical horticulture, truck crops, and viticulture.

Graduates are fitted to enter a variety of occupations in the production and technical fields, as well as in general farming. A few examples of such positions are those of farm superintendents and managers of orchards, vineyards, nurseries, etc.; field representatives for commercial organizations and marketing associations; salesmen for concerns handling agricultural equipment and chemicals; plant breeders; agriculture teachers in high schools or junior colleges; employees of federal, state, and other governmental agencies; and laboratory and field technicians in public service and in commercial laboratories. The student may also pursue graduate work leading to a master's degree in any of

* Students should transfer to the Berkeley campus after the freshman year.

† Or Naval Science (3 units per semester).

the fields listed above, and may prepare for a career in research by seeking a doctorate in plant pathology, genetics, plant physiology, botany, horticultural science (at Los Angeles), and other allied fields.

With the exception of the major work, the plant science curriculum requirements may be met on all campuses; it is therefore possible for students to enter the College of Agriculture on any one of the three campuses and to transfer from one to another as may be required.

Majors

Agronomy.—The Division of Agronomy offers this major on the Davis campus. It consists of upper division courses designed to familiarize the student with the relation of environment and crop distribution and of soil fertility and soil management to the production of field crops; the morphology, adaptation, and principal diseases of field crops; the factors determining their quality and value, and the processes of manufacturing the crop products; and the principles underlying the methods of improving these crops.

Adequate facilities are available for graduate study and research. At Davis, approximately 100 acres are available for investigations with field crops. Greenhouses and laboratories at Berkeley and Davis are well equipped for work on taxonomic, morphological, and physiological, genetic, and other fundamental field crop problems.

Genetics.—At Berkeley, the Division of Genetics offers an undergraduate major including general genetics, cytogenetics, advanced genetics, statistics, biochemical genetics, population genetics, and organic evolution. There are also available in other departments at Berkeley general courses in cytology which are fundamental to a genetics major, as well as valuable correlated courses in mathematics, botany, zoölogy, biochemistry, physiology, and other subjects.

At Davis it is possible to arrange various combinations of courses so as to complete an undergraduate major in genetics. Such a major must include general genetics and either plant or animal cytology; it may include plant breeding, fruit breeding, theory of probability, or statistics.

At Los Angeles one course each in plant genetics and plant breeding are offered at present. Students desiring to major in genetics are advised to spend the junior or senior years at either Berkeley or Davis.

Prospective students should study general botany and zoölogy, followed by either plant or animal morphology, anatomy, physiology, and taxonomy. Students intending to specialize in statistics as a genetic tool should have at least one semester of calculus.

Students contemplating a professional future in genetics should look forward to graduate study for a higher degree and should familiarize themselves with the requirement for genetics. Such students are strongly advised to include appropriate basic requirements, such as those in languages and mathe-

matics, in their undergraduate programs. (See ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

General Horticulture.—Instruction in the field of general horticulture is available on either the Davis or Los Angeles campuses. The major consists of upper division courses selected from the offerings of the divisions of Ornamental Horticulture, Pomology, Subtropical Horticulture, and Viticulture and Enology approved by any one of the four divisions concerned in the offering of this major. The courses offered provide the student with the knowledge necessary to understand the California tree fruit, berry, grape, flower crop, and nursery industries as well as the problems of production, handling and preparation, shipment, distribution and marketing, and utilization.

Irrigation.—This major is offered by the Division of Irrigation at Davis, and is concerned with the agricultural and economic phases of irrigation and the engineering phases as far as they relate to construction and use of farm irrigation systems. Undergraduate instruction covers the various steps in the development of irrigation systems, the use of irrigation water on the farm, and the principles underlying irrigation and its soil and plant relationships. Advanced instruction deals mainly with basic problems of soil moisture and the moisture relations of plants to irrigation problems. The division is also prepared to direct a limited number of advanced students in other phases of agricultural irrigation, and in problems of irrigation economics and community irrigation organization.

As the major part of the University Farm is under irrigation, there is ample opportunity for field studies. The division has at its disposal about 50 acres which are used for purposes of instruction and investigation.

Ornamental Horticulture, including Floriculture.—This major is available on the Los Angeles campus where it is given by the newly created Division of Ornamental Horticulture. It consists of upper division courses approved by the division. The field covered by this major includes studies of the exceedingly rich variety of ornamental plant materials and turf plants employed for landscape purposes in California, of the cut-flower industries—both field and greenhouse—and of the flower-seed industries. The facilities now available for instruction and research include the ornamental horticulture area of approximately 26 acres on which are located greenhouses, headhouse laboratories and flower-crop plantings, and a small botanical garden containing ornamental plant materials. The Division of Ornamental Horticulture also offers graduate instruction in the field of horticultural science.

Plant Pathology.—This major is offered by the Division of Plant Pathology at Berkeley and Davis. The upper division courses are designed to train students in principles and techniques, and to introduce them to some of the specialized fields of application. Training at this level enables graduates to obtain positions in state or federal inspection services and in sales or promotion work with commercial companies.

Those desiring to go into professional work involving teaching or research ordinarily take several years of graduate work after attaining the bachelor's degree. For such students the following courses are recommended: botany (taxonomy, anatomy, cytology, physiology, and mycology), bacteriology, genetics, chemistry (quantitative, organic, physical; and plant biochemistry), French, and German.

Pomology.—This major is offered on the Davis campus by the Division of Pomology, and includes instruction in the production of olives, nuts, berries, and all deciduous fruits (except the grape). For students interested in graduate study and research in physiological and other problems fundamental to the fruit industry, excellent laboratories and apparatus are available.

Subtropical Horticulture.—The Division of Subtropical Horticulture on the Los Angeles campus offers this major, which consists of upper division courses approved by the division. Excellent facilities are available for teaching and research in subtropical horticulture. These include the subtropical horticulture area of 14 acres on which are located greenhouses and lathhouses, a splendidly equipped facility for instruction and research in plant propagation, and extensive teaching collections of subtropical fruit-plant materials. Excellent facilities for instruction and research in fruit physiology are also available. The Division of Subtropical Horticulture also offers graduate instruction in the field of horticultural science.

Truck Crops.—The major is given on the Davis campus by the Division of Truck Crops. The upper division work includes courses in vegetable production, vegetable physiology, genetics, and plant breeding. The offerings are designed for students who wish to produce vegetables as field crops or to prepare for teaching or research. The division is equipped with laboratories, greenhouses, lathhouse, specially constructed bulb-storage house, cold storage facilities, and a complete irrigation system for studies on the problems of this major California industry.

Viticulture.—The Division of Viticulture on the Davis campus offers facilities for undergraduate and graduate work in the production of grapes and raisins. Classroom instruction is supplemented by actual field practice. A vineyard of 56 acres, containing over 1,500 named varieties of grapes and rootstocks and several thousand seedlings, is maintained for research and instruction. Laboratories, greenhouse space, and a field and packing house provide facilities for the growing and handling of the vine and its fruit. The old Irrigation Building provides classrooms and laboratories for both teaching and research.

Students primarily interested in enology will normally major in this subject under the food science curriculum.

Curriculum in Plant Science

(a) Required:	<i>Units</i>
Chemistry (may include biochemistry).....	16
Botany and plant physiology	9
Physics	6
Bacteriology	4
Economics	3
English and/or speech	6
Genetics	4
Plant pathology	4
Soils and/or irrigation	6
Entomology	4
Zoölogy	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 65

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following majors, or in a closely related major, selected with the approval of the major adviser: agronomy, genetics, general horticulture, irrigation, ornamental horticulture, plant pathology, pomology, subtropical horticulture, truck crops, and viticulture.

(c) A summer practice course of six weeks may be prescribed in addition to the above as a major requirement.

Certain courses are required by the following majors:

Irrigation: Chemistry 1A, 1B, 5, and 8; Botany 1 and 7; Mathematics 3A and 3B; Physics 2A and 2B; Engineering 1A; Agronomy 110; Irrigation 100, 110, and 130.

Pomology: Chemistry 1A, 1B, 5, and 8; Botany 1 and 7; Agricultural Engineering 103; Agronomy 110; Horticulture 2, 105P, 106A, 106B, 112, and 121.

Viticulture: Chemistry 1A, 1B, 5, and 8; Botany 1, 7, and 105; Agricultural Engineering 103; Agronomy 110; Horticulture 2, 116, 105v; and Horticulture 112 and 121 or Horticulture 120A and 120B.

Examples of Plant Science Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Chemistry 8, 5	3	3
Chemistry 1A-1B	5	5	Zoölogy 1A	4	..
Physics 2A-2B	3	3	Bacteriology 1 .....	..	5
Physics 3B .....	..	1	Geology 1	3	..
English 1A or Speech 1A ..	..	3	English 1B or Speech 1B ..	..	3
Elective .....	..	3	Elective	3	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>		<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	15	17		15	16

Davis

FRESHMAN YEAR				SOPHOMORE YEAR			
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units		
Military Science	2	2	Military Science	2	2		
Botany 1	5	..	Chemistry 8, 5	3	3		
Chemistry 1A-1B	5	5	Bacteriology 2	4	..		
Economics 1A .....	..	3	Botany 7 .....	..	4
English 1A-1B	3	3	Physics 2A-2B	3	3		
Zoölogy 10 .....	..	3	Agronomy 1, Horticulture 2, or Truck Crops 1... ..	3	..	
			Elective .....	..	3	
	15	16		15	15		

Los Angeles

FRESHMAN YEAR				SOPHOMORE YEAR			
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units		
*Military Science	1½	1½	*Military Science	1½	1½		
Physical Education	½	½	Physical Education	½	½		
Chemistry 1A-1B	5	5	Physics 2A-2B	4	4		
Botany 1	5	..	Chemistry 8, 5A	3	3		
English 1A or Speech 1A ..	..	3	Bacteriology 1 .....	..	4
Zoölogy 12	3	..	Subtropical Horticulture 2, 110	3	2		
Economics 1A .....	..	3	English 1B or Speech 1B..	3	..	
History 7A .....	..	3				
	15	16		15	15		

SOIL SCIENCE

Soil science as a profession has received wide recognition and expansion during the last decades. From a field consisting of largely unorganized and often questionable facts, the study of soils has developed into a highly technical science with broad economic and social ramifications. Graduates with majors in soil science occupy positions as research workers in numerous government, state, and private research laboratories; they are managers of farms and commercial greenhouses; they act as soil fertility and plant nutrition specialists in large agricultural corporations including the fertilizer industry; they are government and state soil surveyors and conservationists. As farmers, as teachers in agricultural colleges and universities, as farm advisors and as land-use planners they are influential in advancing education in agriculture and in contributing to the betterment of the economic welfare of the farm population.

The training of soil scientists follows a plan that emphasizes development of scientific thinking and training in essential, intellectual work habits. It enables the student to gain facility and competence in applying scientific principles to problems of crop production, soil management, and soil classi-

* Or Naval Science (3 units per semester).

fication. This plan includes among its objectives: (1) a working knowledge of elementary mathematics and an acquaintance with calculus; (2) a thorough background in chemistry and a well-grounded knowledge of physics; (3) a familiarity with botany, especially plant physiology, plant nutrition, and microbiology; (4) a good foundation in the geological sciences with emphasis on petrology. In each of these fields at least a grade C must be attained.

Instruction in soil science is intended to familiarize the student with modern views on soils and soil-plant relationships. Basic courses on soil characteristics, soil chemistry, and soil microbiology cover texture, structure, and consistence of soils, soil moisture in all its phases, chemical composition of soils and chemical reactions, microbiological activities in soils, and, in general, factors determining soil productivity. Basic courses in soil morphology deal with the factors and processes of soil formation, profile description, methods of soil mapping and classification, and agricultural utilization of soils. More advanced courses emphasize soil physics in all its aspects; they discuss selected chemical phenomena including adsorption and base exchange processes, and they embrace an intensive study of the properties of colloidal systems. Advanced instruction in plant nutrition considers the relationships between metabolic processes of plants and their mineral nutrition, and a survey of deficiency diseases.

Students who intend to become soil specialists should realize that agricultural experience is desirable for a practical application of the scientific principles of soil management and plant nutrition. Majors who wish to pursue special phases of applied soil science may profitably spend a semester at the College of Agriculture at Davis.

The four-year program does not provide sufficient time for the study of soil in relation to the broader aspects of economic and social planning. Students qualified for advanced work may pursue such studies by taking appropriate courses in economics, geography, history, philosophy, etc.

Students who expect to become investigators or teachers should plan to undertake graduate work leading to the degree of Doctor of Philosophy. Advanced work in the basic sciences, including additional mathematics, is essential for this purpose.

General courses in soil science are given at Los Angeles and at Davis. Soil Science 110A at Los Angeles corresponds to Soil Science 110 at Berkeley.

(a) Required:	Curriculum in Soil Science	Units
	Mathematics (analytic geometry and calculus)	6
	Chemistry (including physical chemistry)	19
	Physics (including laboratory)	8
	Botany (including plant physiology)	12
	Bacteriology	4
	Mineralogy	3
	Geology (including petrology)	6
	Economics	6
	English and/or speech	6
		<hr/> 70

(b) In addition, students must take at least 24 units in soil science, to be selected with the approval of the major adviser.

(c) A summer field course may be prescribed, in addition to the above, as a major requirement.

Examples of Soil Science Program

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Bacteriology 1 .....	..	5
Chemistry 1A-1B	5	5	Chemistry 8, 5	3	3
Physics 2A-2B	3	3	English 1A-1B or Speech 1A-1B	3	3
Physics 3A-3B	1	1	Geology 1	3	..
Electives	2	6	Mathematics 3A-3B	3	3
	—	—	Mineralogy 4A	3	..
	18	17		—	—
				17	16

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
English 1A-1B	3	3	Chemistry 8, 5	3	3
Botany 1	5	..	Economics 1A-1B	3	3
Chemistry 1A-1B	5	5	Bacteriology 2	4	..
Mathematics 11A-11B ...	3	3	Geology 1 .....	..	3
Elective .....	..	3	Physics 2A-2B	3	3
	—	—	Physics 3A-3B	1	1
	18	16		—	—
				16	15

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
*Military Science	1½	1½	*Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
Botany 1	5	..	Chemistry 5A, 8	3	3
Chemistry 1A-1B	5	5	Economics 1A-1B	3	3
Mathematics 3A .....	..	3	English 1B or Speech 1B ..	..	3
Physics 2A-2B	4	4	Geology 5	4	..
English 1A or Speech 1A ..	..	3	Bacteriology 1 .....	..	4
	—	—	Geology 6	4	..
	16	17	Mathematics 3B .....	..	3
				—	—
				16	18

* Or Naval Science (3 units per semester).

VETERINARY SCIENCE

The veterinary science curriculum is designed to give students basic training which will prepare them for the subsequent two years of graduate work leading to the degree of Doctor of Veterinary Medicine. It is based upon two years of college training in the arts and sciences and two years of professional study which will satisfy the requirements for the degree of Bachelor of Science in the College of Agriculture. The junior and senior years of this curriculum, as well as two years of graduate study to follow, are open only to those students who have been selected for admission to the School of Veterinary Medicine.

The School of Veterinary Medicine at present occupies a part of the Animal Science Building on the Davis campus, but construction has begun on a new Veterinary Science Building which should be ready for occupancy early in 1950.

Admission to the School of Veterinary Medicine.—Preveterinary work, when taken in the University of California, is administered by the College of Agriculture. A student can complete the requirements for admission to the School of Veterinary Medicine on the Berkeley, Los Angeles, or Davis campuses of the University of California or at any accredited junior college or four-year college offering the courses prescribed for the freshman and sophomore years. The preveterinary curriculum offers a well-balanced basic training in the natural sciences and humanities which will prepare the student not only for the courses of the School of Veterinary Medicine but also to meet the varied problems of his chosen profession.

Enrollment in the school is limited—the candidates being selected in major part on the basis of scholarship. The student should, therefore, plan his program in such a way that in the event he fails to enter the School of Veterinary Medicine he can complete the requirements for the bachelor's degree in some other curriculum without loss of time.

Students are admitted to the School of Veterinary Medicine in the fall of each year. The necessary application blank may be obtained from the Recorder, College of Agriculture, University of California, Davis, and must be filed with him before April 1. All the requirements need not be completed at that time, but the student must supply a transcript showing requisite work completed or in progress.

Candidates for admission to the School of Veterinary Medicine must complete: 1. Mathematics through trigonometry; Subject A; military science or naval science; and American History and Institutions, as required (see page 61). 2. At least 60 units of credit, including the prescribed subjects listed in the following preveterinary curriculum (except that minor shortages may be waived by the Admissions Committee of the School of Veterinary Medicine).

Curriculum in Veterinary Science

Preveterinary

	<i>Units</i>
English composition and additional English or speech	6
Chemistry (general, inorganic, and organic)	13
Zoölogy (including embryology)	10
Physics (mechanics, heat, light, electricity)	6
Statistics	3
Restricted electives*	12
	<hr/> 50

Veterinary

	<i>Units</i>
Biochemistry	5
Physiology	5
Genetics	4
Botany	2
Animal science†	8
Veterinary science	36
Parasitology	4
	<hr/> 64**

Examples of Veterinary Science Program

Preveterinary Curriculum

Berkeley

FRESHMAN YEAR			SOPHOMORE YEAR†		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
English 1A	3	..	Chemistry 8	3	..
English 1B or Speech 1A . . . . .	..	3	Zoölogy 1A-1B	4	4
Chemistry 1A-1B	5	5	Statistics . . . . .	..	3
Physics 2A-2B	3	3	Electives	6	6
Elective	3	3			
	<hr/> 16	<hr/> 16		<hr/> 15	<hr/> 15

* Courses selected from the fields of social sciences, foreign languages, philosophy, psychology, fine arts, and literature, and/or additional courses in English, speech, and mathematics.

† Any lower or upper division courses in the divisions of Animal Husbandry, Dairy Industry, and/or Poultry Husbandry.

** See section 2(a) on page 63 concerning the Bachelor of Science degree requirements.

† At Berkeley, Zoölogy 100 must be taken in a Summer Session following completion of Zoölogy 1A-1B.

Davis

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
English 1A-1B	3	3	Chemistry 8	3	..
Chemistry 1A-1B	5	5	Physics 2A-2B	3	3
Zoölogy 1A-1B	4	4	Mathematics 13 .....	..	3
Elective	3	3	Zoölogy 100A	2	..
	—	—	Elective	6	9
	17	17		16	17

Los Angeles

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
†Military Science	1½	1½	†Military Science	1½	1½
Physical Education	½	½	Physical Education	½	½
English 1A	3	..	Chemistry 8	3	..
English 1B or Speech 1A ..	..	3	Zoölogy 1A-1B	4	4
Chemistry 1A-1B	5	5	Zoölogy 4 .....	..	2
Physics 2A-2B	4	4	Statistics	2	..
Elective	3	3	Elective	6	9
	—	—		17	17
	17	17			

CURRICULUM IN AGRICULTURAL ENGINEERING*

(An Offering in the Colleges of Engineering)

Agricultural engineering requires basic engineering education equivalent to that for mechanical, civil, or other branches of engineering. The application of engineering throughout all the phases of agriculture from rural dwellings, through crop and livestock production, and crop processing is extensive and varied. The agricultural industry is composed of a large number of individually managed units in contrast to the large, centrally controlled manufacturing industries. For this reason much engineering service comes to agriculture from state and federal experiment stations and related public agencies. Accordingly, agricultural engineering graduates are required in public service. Others are employed by manufacturers of farm implements and equipment, and many engineers are engaged in agricultural production and processing.

The curriculum in agricultural engineering is given in the Colleges of Engineering, Berkeley and Los Angeles, with the coöperation of the College of

† Or Naval Science (3 units per semester).

* Prospective students should consult the ANNOUNCEMENT OF THE COLLEGES OF ENGINEERING.

Agriculture. Under the present plan a student may spend the first three years at the Berkeley campus or Los Angeles campus (or the first two years in a junior college with the third year at Berkeley or Los Angeles). The summer field course and the senior program must be taken at Davis. The entire facilities of the Engineering Colleges at Berkeley and Los Angeles are available to train the agricultural engineering student in his first three years in the same manner as other engineering students are trained. Some specialization in agriculture is afforded by the College of Agriculture in the second and third years, but the main orientation in agricultural engineering is offered on the Davis campus. The senior courses at Davis are planned to take advantage of the agricultural staff and laboratories, in such fields as soil science, agronomy, and irrigation, and particularly of the staff and facilities of the Division of Agricultural Engineering. The curriculum is designed to prepare the student to apply engineering principles to agricultural practice. The engineering courses given at Davis include the design, selection, operation, and maintenance of farm power and machinery; the design and construction of farm structures; selection of building materials; design of farmstead sanitation, lighting, and water supply; and theory of heat transfer, evaporation, and processing. Supplementary courses in irrigation and soil science treat, respectively, hydraulic systems, ground-water supplies, plant use of water, and soil profiles, properties, structure, classification, and management. A special summer practice and travel course is offered which includes a study of engineering problems on typical farms in California; inspection of dairy processing plants, fruit and vegetable packing plants, dehydrators and implement manufacturing plants; and laboratory and field studies of farming equipment.

Matriculation Requirements.—A statement concerning matriculation requirements will be found on pages 51–57. High school subjects prerequisite to college courses required in all engineering curricula include plane geometry, 1 unit; algebra, 2 units; trigonometry, $\frac{1}{2}$ unit; mechanical drawing, 1 unit; chemistry, 1 unit, or physics, 1 unit (both are desirable). Without this preparation it will be necessary for the student to take equivalent courses in college, a process which will prevent his taking regular college courses and which will delay his graduation.

Admission to the College of Engineering.—Satisfaction of the matriculation requirements admits the student to the University but not necessarily to the College of Engineering. Admission to the College of Engineering is based primarily on the results of a prescribed examination. Places and times for the examinations may be obtained from the Dean of the College of Engineering.

The agricultural engineering student must enroll in the College of Engineering at Berkeley or Los Angeles not later than the beginning of the junior year, since this curriculum is in engineering. The field course at Davis is best taken at the end of the sophomore year, and the entire senior year is given only at Davis.



A seed-planting machine being demonstrated to a group of agricultural engineering students, Davis campus

Requirements for the Degree of Bachelor of Science.—The B.S. degree in the College of Engineering is awarded to those candidates who

1. Satisfy the general University requirements:

- (a) Military Science. Eight units credit toward the degree will be allowed to those students who are required to take military science. Those not required to take military science must make up the 8 units by taking elective courses.
- (b) Subject A.
- (c) American History and Institutions.
- (d) Residence during the senior year. Students in the College of Engineering are required to take the final 32 units of work in residence rather than the minimum required by the University.
- (e) Grade points.

2. Satisfactorily complete one of the engineering curricula. Beyond the 72 units common to all engineering curricula, the one in agricultural engineering requires a total of 135 units including the following:

(a) Required:	<i>Units</i>
Mechanics, thermodynamics, fluid mechanics, electric systems	18
Irrigation, soil science, agronomy	12
Agricultural machinery and structures	19
Optional professional subjects	6
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 55

3. Satisfy the requirements in English.

Students who devote full time to University studies may complete the required courses in four years. Those who engage in part-time employment should plan to spend more than four years by enrolling each semester for fewer than the required number of units. For such students, course sequences must be carefully planned if delay is to be avoided.

Upon admission to the College, engineering students are assigned to faculty advisers, and are under the guidance of the Dean of the College of Engineering and the Committee on Study Lists. Study programs are arranged in conference with the adviser and must be approved by him.

Examples of Agricultural Engineering Program
(College of Engineering)

FRESHMAN YEAR

<i>Berkeley</i>			<i>Los Angeles</i>		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	†Military Science and Physical Education	2	2
Mathematics 3A-3B	3	3	Mathematics 5A-5B	5	3
Physics 4A .....	..	4	Physics 1A .....	..	3
Chemistry 1A, 8	5	3	Chemistry 1A-1B	5	5
Engineering 22, 23	2	2	Engineering 2, 8	3	2
Engineering 1A .....	..	3	Engineering 11A .....	..	2
Elective	3	..	Engineering 17A .....	..	1
	—	—	Engineering 48	1	..
	15	17		—	—
Engineering 48 (recom- mended)	1	..		16	18

SOPHOMORE YEAR

<i>Berkeley</i>			<i>Los Angeles</i>		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	†Military Science and Physical Education	2	2
Mathematics 4A-4B	3	3	Mathematics 6A-6B	3	3
Physics 4B-4C	4	4	Physics 1D-1C	3	3
Engineering 40-41	2	4	Geology 2	3	..
Engineering 35 .....	..	3	Engineering 15A-15B	3	3
Engineering 24	2	..	Elective	3	6
*Agricultural Engi- neering 12 .....	..	2		—	—
Elective	3	..		17	17
	—	—		—	—
	16	18		17	17
Agricultural Engineering 49 (6)—re- quired field course at Davis.			Agricultural Engineering 49 (6)—re- quired field course at Davis.		

JUNIOR YEAR

<i>Berkeley</i>			<i>Los Angeles</i>		
<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>	<i>Course</i>	Fall <i>Units</i>	Spring <i>Units</i>
Engineering Design 102B ..	3	..	Engineering 102B	3	..
Mechanical Eng. 103	3	..	Engineering 103A .....	..	3
Mech. Eng. 105A-105B	3	3	Engineering 105A-105B ..	3	3
Civil Engineering 108A	3	..	Engineering 108B	2	..
Civil Engineering 108F	1	..	Engineering 108F .....	..	1
Electrical Eng. 100A-100B ..	3	3	Engineering 100A-100B ..	3	3
Electrical Eng. 104A-104B ..	1	1	Engineering 104A-104B ..	2	2
Agricultural Economics 118 .....	..	3	Mathematics 110C	3	..
Engineering Design 106 (or Civil Eng. 107A) .....	..	4	Elective .....	..	5
Elective .....	..	3		—	—
	—	—		16	17
	17	17		16	17

† Or Naval Science (3 units per semester).

* Agricultural Engineering 12 not required of students entering as juniors.

SENIOR YEAR

Davis

Course	Fall Units	Spring Units
Agricultural Engineering 113 .....	..	4
Agricultural Engineering 114	3	..
Agricultural Engineering 115	3	..
Agricultural Engineering 130 .....	..	1
Mechanical Engineering 151 (or Physics 116) .	3	..
Mechanical Engineering 152A (or Chemistry 109) .....	..	3
Irrigation 120	3	..
Soil Science 106 .....	..	4
Agronomy 1	3	..
Elective	3	3
	18	15
Additional recommended elective: Agricultural Economics 118, Agricultural Engineering 199, Agricultural Engineering 106, Bacteriol- ogy 1, Botany 107, Chemistry 101, Chemistry 109, Mathematics 130, Zoölogy 10		
		2 to 4

The program outlined may be modified, with the approval of the Study Lists Committee, to meet the needs of the student who is preparing for some special phase of agricultural engineering, such as rural electrification, pest control, or food processing.

The allocated technical courses have been limited in order to provide opportunity for the student to take cultural courses. As a minimum, 12 units of free electives are required for graduation in all engineering curricula, and for the agricultural engineering student 3 or more units must be selected in English or speech, and at least 9 units from any two of the following groups:

1. English and speech
2. Foreign languages
3. Business administration, economics, political science
4. Anthropology, history, social institutions, psychology
5. Life sciences
6. Fine arts and philosophy

The state requirement for 6 units of American history and institutions technically falls in the 9 units of free electives, but it is possible for these subjects to be passed by examination if greater advantage is to be taken of the wide selection of nonengineering courses available on the Berkeley and Los Angeles campuses.

Students preparing for careers in teaching, research, or analytical design should intensify their undergraduate work and plan for postgraduate work. The ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION and SOUTHERN SECTION, describes the requirements for advanced degrees. Fellowships or half-time assistantships are available to superior students.

GRADUATE STUDY

WORK LEADING TO HIGHER DEGREES

The conditions for graduate study in all branches of agriculture are exceptionally favorable in California. The diversity of climate, forests, natural livestock ranges, crops, and soils provides a wide choice of subjects for investigation.

Work leading to the degrees of Master of Science and Doctor of Philosophy may be pursued at Berkeley, Riverside, Davis, Los Angeles, and at other places approved by the appropriate Graduate Council. A graduate program leading to the degree of Master of Education with a specialization in agricultural education is also available. This is designed primarily for teachers of agriculture who desire graduate training.

At Berkeley there are adequate greenhouses and the laboratory and library facilities which a large university provides.

The College at Davis has lands, orchards, vineyards, greenhouses, and laboratories for field and laboratory research. It maintains herds and flocks of all livestock species of commercial importance.

At Los Angeles excellent facilities are available for graduate work in horticultural science, with special reference to subtropical fruit and ornamental plant materials.

At the Citrus Experiment Station at Riverside there are extensive facilities for study and research by properly prepared students.

Further information is given in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the ANNOUNCEMENT OF THE GRADUATE DIVISION IN AGRICULTURE AND RELATED SCIENTIFIC FIELDS, which may be obtained from the Dean of the Graduate Division, Northern Section, University of California, Berkeley 4, and the ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION, which may be obtained from University of California, 405 Hilgard Avenue, Los Angeles 24, California.

REQUIREMENTS FOR TEACHING CREDENTIALS

The student who desires to teach agriculture or home economics in the secondary schools may obtain the special secondary credential in vocational agriculture or home economics, or the general secondary teaching credential, or both. At least one year of graduate work is required to fulfill the requirements.

The special credential permits the holder to teach vocational agriculture under the Smith-Hughes Act or family life education under the Federal and State Vocational Education Acts, but without a general secondary credential the future teacher will be severely handicapped.

The Special Secondary Credential in Vocational Agriculture.—The University of California coöperates with the Bureau of Agricultural Education of the State Department of Education in offering the graduate training required

for the special vocational agriculture credential. The upper division and professional courses in education required for this credential are available on the Davis campus. Students desiring admission to the graduate training for the special credential must apply for and receive "cadet" appointments from the Chief of the Bureau of Agricultural Education. Appointments are made only after personal interviews. Application must also be made for admission to the Graduate Divisions of the University. Since supervised teaching comprises a major part of this training, students spend this fifth year in directed teaching centers. (See "Incidental Fee," page 37.)

The Special Secondary Limited Credential in Agriculture.—This credential authorizes the holder to teach the agricultural subjects named in the credential in secondary schools and requires 8 semester units of work in each of the subjects named. It does not authorize the holder to teach vocational agriculture in departments organized under the Federal and State Vocational Acts. Fifteen semester hours of professional work in education, including 4 semester units of directed teaching in agriculture, are required. The directed teaching and professional methods courses required for this credential are offered on the Los Angeles campus of the University of California.

The Special Secondary Credential in Homemaking.—The University of California coöperates with the Bureau of Homemaking Education of the State Department of Education in offering the training required for this credential. The required upper division and professional courses in education are available on the Davis campus, and the undergraduate courses comprising the general major in home economics satisfies the subject-matter requirements for this credential.

Normally one semester of graduate work devoted primarily to supervised teaching and instruction in professional methods is required to complete credential requirements.

The General Secondary Credential.—The holder of the general credential with a major in agriculture or home economics may teach, in addition to agriculture or home economics, any high school subjects in which he is prepared. Conditions are especially favorable on the Los Angeles campus for agriculture students who wish to complete the requirements for the general secondary credential. The general secondary credential alone does not entitle the holder to teach agriculture in high school departments organized under the Federal and State Vocational Educational Acts (Smith-Hughes, George-Deen, etc.).

Inquiries concerning requirements should be addressed to the Dean of the School of Education, University of California, Berkeley 4, or the Dean of the School of Education, University of California, 405 Hilgard Avenue, Los Angeles 24, California.

COLLEGE OF AGRICULTURE

COURSES OF INSTRUCTION

AT BERKELEY, DAVIS, LOS ANGELES, AND RIVERSIDE

EXPLANATORY NOTE

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to February); II, second semester (February to June); Yr., throughout the first and second semesters. When no hours are stated it is understood that these are to be arranged later. Final class hours will be found in the SCHEDULE AND DIRECTORY of the campus where the student registers.

CLASSIFICATION AND NUMBERING

Courses are classified and numbered as follows:

(1) *Lower division courses* (numbered 1-49, or sometimes indicated by letters if in subjects usually given in a high school). A lower division course is one open to freshmen and to sophomores; such courses do not count as upper division work in any department.

(2) *Upper division courses* (numbered 100-199). An upper division course is one which is open only to those students who have completed a lower division course, or courses, in that department; or is an elementary course in a subject of such difficulty as to require the maturity of upper division students. Registration in upper division courses in the College of Agriculture is regulated by the possession of the necessary prerequisites rather than by class standing.

Special study courses for advanced undergraduates are numbered 199. Credit in a special study course for undergraduates may not exceed 5 units a semester on the Davis and Berkeley campuses or 4 units on the Los Angeles campus.

(3) *Graduate courses* (numbered 200-299). As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation normally consists of the completion of at least 12 units of upper division work basic to the subject of the graduate course, irrespective of the department in which such basic work may have been completed.

(4) *Professional teacher-training courses* in the Department of Education and courses in other departments that are specially intended for teachers or prospective teachers (numbered 300-399).

(5) *Professional courses* in the Department of Home Economics (numbered 400-499).



Students in entomology collect and classify insects of economic importance, Berkeley campus

1949-1950
COURSES OF INSTRUCTION
OFFERED AT BERKELEY

COURSES OFFERED ON THE BERKELEY CAMPUS

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

201A-201B. **Research in Agricultural Chemistry.** (1-6; 1-6) Yr.
The Staff (Mr. — in charge)

Members of the Group in Agricultural Chemistry.*

The research work will ordinarily be under the direction of a member of the instructing staff, who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

An average grade of at least C in all courses undertaken is prerequisite to all upper division courses in agricultural economics.

1. **The Agricultural Industry.** (3) I. Mr. Voorhies
Lectures, M W F, 8.

Comparison of agriculture with other industries: population, production, improvements, trends, etc. Historical sketch of the development of agriculture. Types of farming and their geographical distribution. Movements of agricultural products. Institutional aids to agriculture.

100. **Comparative Agriculture.** (3) I. Mr. Voorhies
Lectures, M W F, 10.

Prerequisite: Economics 1A-1B.

The agriculture of the principal countries of the world, with special reference to the influence of food supply upon the development of man.

101A. **Principles of Marketing Agricultural Products.** (3) I and II.

I. Lectures, M W F, 8. II. Lectures, M W F, 2. Mr. Erdman

Prerequisite: Economics 1A-1B. Not open to students who have taken Business Administration 123.

Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products. Government in its relation to marketing; consideration of proposals for improvement.

101B. **Coöperation in Agriculture.** (3) II. Mr. Erdman
Lectures, M W F, 8.

Prerequisite: Agricultural Economics 101A or Business Administration

123.
Farmers' coöperative organizations.

102. **Land Economics.** (3) I. Mr. Weeks

Lectures, Tu Th, 10. Laboratory: Sec. 1, Tu, 1-3; Sec. 2, Tu, 3-5; Sec. 3, Th, 1-3; Sec. 4, Th, 3-5.

Prerequisite: Economics 1A-1B.

The utilization of agricultural land, economic rent, land appraisal, political and economic problems of land development, land settlement, land policies. The relation of population growth to economic utilization of land and to land value.

* See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

104. **Agricultural Economics.** (3) I and II. I. Mr. Hoos; II. Mr. Fuller
I. Lectures, M W F, 9. II. Lectures, M W F, 1.
Prerequisite: Economics 1A-1B.
The application of economic principles to the problems of agriculture.
105. **Agricultural Economics Measurements.** (3) II. Mr. Lee
Lectures, Tu Th, 8; laboratory, Th 1-3.
Prerequisite: Economics 2, Mathematics 11A-11B or 3A-3B.
Sources, collection of data, and analysis of selected measurements including parity prices, parity income, employment, wages, production, and national income.
107. **Market Prices.** (3) II. Mr. Wellman
Lectures, M W F, 9.
Prerequisite: Agricultural Economics 104, 105.
Application of economic principles and measurements in the analysis of the behavior of agricultural prices.
110. **Agricultural Finance.** (3) II. Mr. Voorhies
Lectures, M W F, 10.
Prerequisite: Economics 1A-1B.
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
111. **Economics of Food Consumption.** (3) II. Mr. Fuller
Lectures, M W F, 2.
Prerequisite: Economics 1A-1B, Agricultural Economics 101A or Business Administration 123, or Economics 105, or Home Economics 141.
Food requirements in relation to national and international policies on agriculture and trade; economic analysis of programs and proposals designed to improve and stabilize nutrition.
- 112A-112B. **Rural Sociology.** (2-2) Yr. Mr. Taylor
Lectures, W, 3-5.
Agricultural Economics 112A is prerequisite to 112B.
The forms of human association in rural environment, including their origins, development, structures, functions, and cultural products. Rural population, social organization and institutions, social psychology, ecology patterns, social change, social pathology.
116. **Agricultural Policy.** (3) II. Mr. Benedict
Lectures, M W F, 11.
Prerequisite: Economics 1A-1B.
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
118. **Farm Organization.** (3) I. Mr. Tinley
Lectures, Tu Th, 9. Discussion: Sec. 1, W, 9; Sec. 2, W, 11; Sec. 3, W, 1; Sec. 4, W, 3.
Prerequisite: at least one course in agriculture.
The place, purpose, and scope of organization; farm enterprises; selecting farms; planning and equipping; capital needs; earnings.

119. **Farm Management.** (3) II. Mr. Adams
 Lectures, Tu Th, 3-5.
 Prerequisite: Agricultural Economics 118.
 Methods of handling properties; duties and qualifications of managers; bookkeeping and accounting; marketing methods; farm labor; tenancy; farm law.
122. **Coöperative Management.** (3) I. Mr. Tinley
 Lectures, Tu Th, 1-3.
 Prerequisite: Agricultural Economics 101A-101B and Business Administration 1A.
 Analysis of organizational and operational problems and policies of agricultural coöperative associations.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Voorhies in charge)
 Prerequisite: senior standing and approval of the division. Limited to agricultural economics majors.

GRADUATE COURSES

202. **Seminar in Agricultural Policy.** (2) II. Mr. Wellman
 Tu, 9-11.
 A study of public and semipublic activities pertaining to agriculture as an industry.
203. **Research in Agricultural Economics.** (1-6) I and II.
The Staff (Mr. Wellman in charge)
- 204A-204B. **Analytical Methods in Agricultural Economics.** (3-3) Yr.
 I. Tu, 9-11. I. Mr. Bressler; II. Mr. Kuznets
 II. Th S, 9-11.
 Evaluation and treatment of economic data in agriculture with emphasis on methods of analyzing relations between two or more variables.
205. **Seminar in the Marketing of Agricultural Products.** (2) II.
 M, 3-5. Mr. Mehren
 An analysis of the economic effects of state and federal activity in the marketing of agricultural products.
- 206A. **Economics of Agricultural Production.** (3) I. Mr. Hoos
 M W F, 2.
 A detailed study of the basic principles of the economics of production.
- 206B. **Economics of Agricultural Production.** (3) II. Mr. Benedict
 M W F, 2.
 The application of economic principles to problems of production adjustment.
207. **Advanced Land Economics.** (2) I. Mr. Weeks
 M, 3-5.
 Land policies, planning, rent, tenure, appraisal, development, and utilization.

208. **Seminar in the Conservation of Natural Resources.** (2) II.
W, 3-5. Mr. Wantrup
The economic and social aspects of the conservation of natural resources in the United States and foreign countries with particular reference to agriculture.
209. **Seminar in Agricultural Market Organization.** (3) I. Mr. Erdman
M W F, 1.
An analysis of the economic factors influencing organization and operating efficiency, price and sales policies, and the financial structure of different marketing organizations.
212. **Seminar in Farm Management.** (2) II. Mr. Adams, Mr. Tinley
F, 2-4.
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.
299. **Special Study for Graduate Students.** (1-4) I and II.
The Staff (Mr. Wellman in charge)
Any properly qualified graduate student who wishes to pursue a special field of study may do so if his proposed program of study is acceptable to the member of the staff with whom he works.

AGRICULTURAL ENGINEERING

12. **Survey and Problems in Agricultural Engineering.** (2) II.
Lectures, Tu, Th, 11. Mr. Walker, Mr. Bainer
The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

AGRONOMY

- *1. **Introduction to Agronomy.** (3) I. Mr. Briggs
Lectures, Th, 1-4.
Principles underlying the distribution and culture of field crops, with emphasis upon seed selection, maintenance of soil fertility, and the theory and practice of dry farming. The production of typical cereal, forage, fiber, and root crops is briefly discussed.
NOTE: Given in the fall semesters of even-numbered years.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Briggs in charge)
Prerequisite: 6 units of upper division agronomy.

GRADUATE COURSE

- 200A-200B. **Research in Agronomy.** (1-6; 1-6) Yr.
Mr. Briggs, Mr. Laude, Mr. Love

ANIMAL HUSBANDRY

7. **Introduction to Animal Husbandry.** (3) II.
Lectures, Th, 1-4. The Staff (Mr. Hughes in charge)
A survey of the sources of the world's supply of animal products. The distribution of domestic animals in the United States. The origin, character-

* Not to be given, 1949-1950.

College of Agriculture

istics, and adaptations of the more important breeds, and influence of environment upon their development.

NOTE: Given in the spring semesters of even-numbered years.

ENTOMOLOGY AND PARASITOLOGY

1. **General Entomology.** (4) I. Mr. Freeborn
Lectures, Tu Th, 11; laboratory, Tu Th, 2-5.
The classification, life history, structure, and physiology of insects.
49. **Summer Practice and Observation Course.** (No credit)
Six weeks. Daily, except Sunday. The Staff (Mr. Essig in charge)
Required of all students with a major in entomology or parasitology.
106. **Insect Morphology and Histology.** (4) II. Mr. Craig
Lectures, Tu Th, 1. Laboratory: Sec. 1, Tu Th, 2-5; Sec. 2, M W, 1-4.
Prerequisite: Entomology I.
Comparative insect anatomy; histological techniques.
110. **Insect Physiology.** (3) I. Mr. Craig
Lectures, Tu Th, 1; laboratory, Tu, 2-5.
The general principles of insect physiology, with experimental studies on nutrition, digestion, excretion, circulation, respiration, and the nervous and hormonal systems.
112. **Systematic Entomology.** (4) I. Mr. Linsley
Lecture, Tu Th, 11; laboratory, Tu Th, 8-11.
Prerequisite: Entomology 1 or consent of instructor.
The classification of insects, taxonomic categories and procedure; bibliographical methods; nomenclature; museum practices.
114. **Forest Entomology.** (3) I. Mr. Linsley
Lectures, M W, 9. Laboratory: Sec. 1, F, 1-4; Sec. 2, W, 1-4.
Insects affecting forest, shade, and ornamental trees.
117. **Helminthology.** (4) I. Mr. Stewart
Lectures, M, 1, S, 8; laboratory, M, 2-5, S, 9-12.
Helminthic infections of man and domestic animals. The biology, prophylaxis, and treatment of the various parasites are dealt with in detail. The laboratory exercises are devoted to the taxonomy and identification of the parasites and to diagnostic laboratory methods.
118. **Plant Nematology.** (4) II. Mr. Allen
Lectures, F S, 8; laboratory, F S, 9-12.
Identification, morphology, biology, and distribution of plant parasitic and associated nematodes. Symptomatology, pathology, and control of nematode infections in cultivated crops. Techniques employed in the manipulation and examination of soil and infected plants.
124. **Economic Entomology.** (4) II. Mr. Essig
Lectures, M W, 1; laboratory, M W, 2-5.
Life histories, habits, distribution, economics, and control of insects attacking agricultural crops and stored products.
125. **Insect Vectors of Plant Diseases.** (4) I. Mr. Freitag, Mr. Sylvester
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
The role of insects in the transmission and causation of plant virus diseases. Greenhouse insect-rearing and virus transmission experiments.

126. **Medical Entomology.** (4) II. Mr. Stewart
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
The role of insects and other arthropods in transmission and causation of diseases of humans and domesticated animals.
127. **Insect Ecology.** (3) II. Mr. Craig, Mr. Usinger
Lectures, M W F, 11.
Principles of ecology; animal communities; insect behavior.
128. **Insect Toxicology.** (4) I. Mr. Hoskins, Mr. Gordon
Lectures, M W, 1; laboratory, M W, 2-5.
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
129. **Biological Control of Insect and Weed Pests.** (3) I. Mr. H. S. Smith
Lectures, M W, 8; laboratory, M, 9-12.
Prerequisite: upper division standing.
Principles and methods of biological control; biology of entomophagous insects; critical discussion of important world projects.
130. **Agricultural Entomology.** (3) II. Mr. Borden
Lectures, M W, 10; laboratory, S, 9-12 (field trip).
Prerequisite: Entomology 124.
An advanced course in the principles and practices of experimental field entomology.
131. **Insect Pathology.** (4) II. Mr. Steinhaus
Lectures, M W F, 9; laboratory, F, 2-5.
Prerequisite: Entomology 1, and at least one course in microbiological sciences (mycology, bacteriology, or protozoology).
General insect pathology and microbiology including biological relationships between microorganisms and insects. Detailed study of bacterial, fungous, virus, and protozoan diseases of insects; non-infectious diseases; histopathology. Microbial agents and biological control.
132. **History of Entomology.** (3) II. Mr. Essig, Mr. Linsley
Lectures, Tu Th, 10; Th, 11.
Prerequisite: Entomology 1, and one additional course in entomology.
Outline of the development of world entomology.
133. **Biology of Aquatic and Littoral Insects.** (4) II. Mr. Usinger
Lectures, Tu Th, 8; laboratory, Tu Th, 9-12.
Habits and ecology of aquatic and semiaquatic insects with emphasis on their relations to problems of wildlife management. It is expected that this will satisfy the entomological requirements for students of the Wildlife Curriculum in the College of Letters and Science.
135. **Insects in Relation to Flowering and Other Ornamental Plants.** (3) I.
Lectures, W F, 1; laboratory, F, 2-5. Mr. Pritchard
Prerequisite: Entomology 124.
The study of the importance, recognition, taxonomy, biology, ecology, and control of insects and related pests of flowering and other ornamental plants.
136. **Insects and Their Relation to Commercial Vegetables and Field Crops.**
(4) II. Mr. Michelbacher, Mr. Middlekauff, Mr. R. F. Smith
Lectures, Tu Th S, 8; laboratory to be arranged; one or more field trips.
Prerequisite: Entomology 124.

The major insects and related organisms attacking commercial vegetable and field crops in California: their biology, ecology, distribution, diagnosis, cultural and chemical control.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Essig in charge)

GRADUATE COURSES

- 200A-200B. **Seminar in Systematic and Economic Entomology, Insect-Borne Plant Diseases, and Biological Control.** (1-1) Yr.
The Staff (Mr. Essig in charge)
- 201A-201B. **Research in Entomology and Parasitology.** (1-6) Yr.
The Staff (Mr. Essig in charge)
- 202A-202B. **Seminar in Medical Entomology and Parasitology.** (1-1) Yr.
Mr. Stewart, Mr. Furman
- 203A-203B. **Seminar in Insect Toxicology and Insect Physiology.** (1-1) Yr.
Mr. Craig, Mr. Hoskins
- 204A-204B. **Seminar in Insect Pathology.** (1-1) Yr. Mr. Steinhaus

FOOD TECHNOLOGY

112. **Principles and Practices of Food Processing.** (3) I. Mr. Cruess
(Formerly numbered 112A.)
Lectures, Tu Th S, 8.
Prerequisite: Chemistry 1A-1B and Bacteriology 1.
Principles and technological processes involved in the preparation, preservation, and examination of fruit and vegetable products.
113. **Chemical and Biochemical Aspects of Food Processing.** (3) II.
(Formerly numbered 112B.) Mr. Mrak, Mr. Phaff
Lectures, Tu Th S, 9.
Prerequisite: Chemistry 1A-1B, 8, and Bacteriology 1.
Relation of food processing and handling to acceptability, color changes, enzyme activity, deterioration, flavor, vitamin retention, and other factors.
114. **Principles of Food Processing Operations.** (4) I. Mr. Marsh
(Formerly numbered 115A.)
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
Prerequisite: Chemistry 1A-1B, 5, 8; Bacteriology 1.
Technical principles relating to processing operations used in the commercial preservation of fruits, vegetables, and other foods; theory and practical applications, including field trips.
115. **Food Analysis.** (4) II. Mr. Joslyn
(Formerly numbered 115B.)
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
Prerequisite: Chemistry 1A-1B, 5, 8; Bacteriology 1 recommended.
Application of quantitative physical and chemical methods of analysis to examination of commercial fruit and vegetable products; laboratory control and research, methods of analysis as applied to food processing; interpretation of results in relation to manufacturing methods and commercial standards.

116. **Yeasts and Related Organisms.** (4) II. Mr. Mrak, Mr. Phaff
Lectures, M F, 1; laboratory, M F, 2-5.
Prerequisite: Chemistry 1A-1B, 8; Botany 1 or 12; Bacteriology 1.
Morphology, development, classification and distribution of yeasts;
relation to other fungi, growth requirements; physiological activities, in-
cluding certain industrial aspects.
117. **Food Microbiology.** (4) I. Mr. Vaughn
Lectures, M W, 1; laboratory, M, 2-5, W, 2-4, and one hour to be arranged.
Prerequisite: Food Technology 114. Recommended but not required:
Bacteriology 105 and Food Technology 116.
Characteristics, activity, and control of beneficial and spoilage organ-
isms in the canning, dehydration, fermentation, freezing, pickling, pre-
serving, and other food industries.
120. **The Natural Coloring Matters.** (3) II. Mr. Mackinney
Lectures, M W, 9, and one lecture-laboratory to be arranged.
Prerequisite: three units of biochemistry or plant biochemistry, or
upper division organic chemistry.
Chemistry of natural pigments and related compounds; spectrophoto-
metric and chromatographic techniques; special emphasis on pigments in
relation to foods.
127. **Recent Advances in Food Technology.** (1) I and II.
The Staff (I, Mr. Vaughn in charge; II, Mr. Mrak in charge.)
(Formerly numbered 127A-127B.)
Lecture, W, 4.
May be repeated once for credit.
Prerequisite: two courses in food technology or the equivalent.
Assigned topics, reports, and discussions concerning recent advances in
food technology.
140. **Unit Operations in Food Industries.** (2) II. Mr. Joslyn, Mr. Vermeulen
Lectures, Tu Th, 10.
Prerequisite: Chemistry 8, 109; Bacteriology 1.
Introduction to selection and operation of processing methods and ma-
chinery, and economics of plant location, with particular emphasis on the
more important unit operations of food engineering.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Mrak in charge)

GRADUATE COURSES

- 200A-200B. **Seminar in Food Technology.** (1-1) Yr.
The Staff (I. Mr. Mackinney in charge; II. Mr. Phaff in charge)
- 237A-237B. **Research in Food Technology.** (1-9; 1-9) Yr.
The Staff (Mr. Mrak in charge)

FORESTRY

1. **Elements of Forestry.** (3) I. Mr. Cockrell
Lectures, M W F, 10.
Not open to students with a major in forestry.
Forests in their relation to national life. The life history of the tree
and the forest. General principles of forestry.

- 49A. **Field Practice Course.** (No credit) Mr. Arnold
Prerequisite: Engineering 1A-1B, Botany 1, and a grade average of C or higher.
Six weeks of summer camp at Meadow Valley, near Quincy, in the Plumas National Forest.
Field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging and milling operations.
- 49B. **Field Practice.** (No credit) Mr. Arnold
Continuation of 49A. Six weeks at the summer camp, following 49A. 49A-49B is required of all students.
100. **Introduction to Professional Forestry.** (3) I. Mr. Baker
Lectures, M W F, 8.
Open only to students whose major is forestry.
The branches of forestry, their significance and relationships; values derived from forests; forest policy.
101. **Introduction to Range Management.** (3) II. Mr. Sampson
Lectures, M W F, 9.
Development and present status; its place in forestry and in agriculture; economic relationships; treatment of the range and handling of livestock on it.
102. **Range Management Technique.** (3) II. Mr. Sampson
Lecture, F, 11; laboratory, M, 1-4, W, 1-4.
Prerequisite: Engineering 1A-1B; Chemistry 8; an elementary course in statistics; Forestry 103 or Botany 151. The additional prerequisites of Forestry 101 and Botany 108 may be taken concurrently.
Field and laboratory procedure, designed especially for students who plan to take advanced work in range management. Special field trips will be arranged.
103. **Principles of Forest Ecology.** (3) I. _____
Lectures, Tu Th S, 10.
Prerequisite: Botany 1 and Chemistry 1A.
Structure of the plant as modified by conditions of habitat. Plant succession and societies.
104. **Silviculture.** (4) I. Mr. Baker
Lectures, M W F, 10. Laboratory: Sec. 1, Th, 1-4; Sec. 2, F, 1-4.
Prerequisite: Forestry 103.
Methods of governing growth and reproduction of forests through the application of ecological laws.
106. **Forest Planting.** (3) II. Mr. Colwell
Lectures, Tu Th, 11; laboratory, Tu, 2-5; and field trips.
Prerequisite: Botany 1.
Artificial establishment of forests from collection of seed to planting of trees; the physiological, environmental, and genetic factors affecting survival and growth of forest seedlings; financial aspects of forest plantations.

108. Dendrology. (4) I.

Lecture, Tu Th, 8. Laboratory: Sec. 1, M W, 1-4; Sec. 2, M W, 1-4; Sec. 3, Tu Th, 1-4. Field trips.

Prerequisite: Botany 1.

Identification by morphological characters of important forest trees of North America; their ecological and geographical distribution; field identification of many forest shrubs.

110. Forest Mensuration. (3) II.

Mr. Zivnuska

Lectures, Tu Th, 9, M, 1; laboratory, M, 2-5.

Prerequisite: a course in elementary statistics; Forestry 49A-49B, or consent of instructor.

Principles underlying log scaling and the estimation of timber volume and value; growth of stands; the application of statistical analysis to forest measurements.

112. Lumber Manufacturing. (3) I.

Mr. Fritz

Lectures, M W F, 8.

Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with the consent of the instructor.

Organization and characteristics of the lumber industry. The manufacture of lumber from log pond to finished product. Seasoning, grading, marketing.

114. Wood Technology. (3) II.

Mr. Fritz

Lectures, M W, 10; laboratory, W, 1-4.

Prerequisite: Chemistry 1A and Botany 1.

Junior and senior students from other departments may be admitted with the consent of the instructor.

Anatomy of wood; properties and uses; identification of commercial species.

115. Physical Properties of Wood. (3) I.

Mr. Cockrell

Lectures, Tu Th, 9; laboratory, Tu, 1-4.

Prerequisite: Physics 2A-2B, 3A-3B, and senior standing.

Density, moisture relations, shrinking and swelling, strength, thermal, electrical, and acoustic properties of wood.

118. Forest Engineering. (3) II.

Mr. Krueger

Lectures, Tu Th, 10; laboratory, Tu, 2-5.

Prerequisite: Engineering 1A-1B and Physics 2A-2B.

Engineering methods involved in logging and forest management.

120. Management of Forest Properties. (4) II.

Mr. Barr

Lectures, M W F, 9; laboratory, F, 1-4.

Prerequisite: Forestry 104 and 110.

Economic and technical principles involved in the management of forest lands for continuous production of timber crops.

121. Forest Economics. (3) I.

Mr. Vaux

Lectures, M W F, 12.

Prerequisite: 6 units of economics and senior standing. Senior and graduate students from other departments may be admitted with the consent of the instructor.

Economic problems and principles involved in the utilization of forest land and timber, and in the distribution of forest products.

122. **Forest Policy.** (3) I. Mr. Vaux
Lectures, M W F, 9.
Prerequisite: 6 units of economics and senior standing.
The evolution of forest policy in the United States and national forest policies. Policy objectives, programs, and groups. Analysis of current policy problems.
123. **Range Utilization.** (3) I. Mr. Biswell
Lectures, Tu Th, 9; laboratory, S, 9-12; field trips.
Prerequisite: Forestry 101, 103, Botany 111, and senior standing; Forestry 102 recommended.
Range use and forage valuations as integral parts of land-use planning, including technical problems of range management.
125. **Forest Influences.** (3) I. Mr. Kittredge
Lectures, Tu Th, 11; laboratory, W, 1-4; field trips.
Prerequisite: Forestry 103, Physics 2A-2B, and senior standing. Recommended: Soil Science 100 and Geography 111.
The influences of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. **Production Methods in the Forest Industries.** (3) II. Mr. Krueger
Lectures, M W F, 10.
Prerequisite: 6 units of economics and senior standing.
Production methods and principles involved in logging; cost analyses.
128. **Forest Protection.** (3) II. Mr. Arnold
Lectures, M W F, 8; one field trip required.
Junior and senior students from other departments may be admitted with the consent of the instructor.
Forest fire behavior; ignition and spread of forest fires and factors by which they are influenced. Forest fire control organization and equipment; methods of fire prevention and suppression.
132. **Forest Photogrammetry.** (3) II. Mr. Colwell
Lectures, Tu Th, 8; laboratory, Th, 1-4. Limited to 42 students.
The construction of planimetric and topographic maps from vertical and oblique aerial photographs. The use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of aerial photo mosaics.
198. **Directed Group Study.** (1-5) I and II. The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of the instructor.
Group study, or investigation, of special problems.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of the instructor.
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

GRADUATE COURSES

- 201A-201B. **Seminar in Forestry.** (2-2) Yr.
201A is not prerequisite to 201B. I. Mr. Kittredge; II. Mr. Krueger

202A-202B. Research in Forestry. (1-6; 1-6) Yr.

202A is not prerequisite to 202B. The Staff (Mr. Baker in charge)

203A-203B. Seminar in Forest Influences and in Forest Ecology. (2-2) Yr.

I. Mr. Kittredge; II. Mr. Sampson

Prerequisite: plant physiology (3 units); Forestry 125 for Forestry 203A; Chemistry 8 and Forestry 103 for 203B. 203A is not prerequisite to 203B.

204. Seminar in Silviculture. (2) I.

Mr. Baker

Prerequisite: Forestry 104.

205. Seminar in Wood Technology. (2) I.

Mr. Cockrell

Prerequisite: Forestry 114.

206. Seminar in Forest Management. (2) II.

Mr. Barr

Prerequisite: Forestry 120, 6 units of economics.

207A-207B. Seminar in Forest Economics. (2-2) Yr.

I. Mr. Vaux; II. Mr. Krueger

Prerequisite: 12 units of economics, agricultural economics, or forest economics. 207A is not prerequisite to 207B.

208. Seminar in Range Management. (2) I.

Mr. Biswell

Prerequisite: Forestry 123.

GENETICS**100. Principles of Genetics.** (4) I.

Mr. Dempster

Lectures, M W F, 8. Laboratory: Sec. 1, W, 1-4; Sec. 2, F, 1-4.

Prerequisite: General botany (Botany 1 or 12, or equivalent). Recommended: general zoölogy (1A or equivalent).

Introduction to genetics with some consideration of its applications in agriculture, biology, and human welfare.

101. Cytogenetics. (3) II.

Mr. Clausen

Lectures, M W F, 8.

Prerequisite: Genetics 101C (may be taken concurrently).

Genetics as related to cytological conditions, with particular reference to plant materials. A laboratory course, Genetics 101C, may be taken concurrently.

101C. Cytogenetics Laboratory. (2) II.

Mr. S. W. Brown, Mr. Stebbins

Laboratory, Tu Th, 1-4.

Prerequisite: Genetics 101 (may be taken concurrently).

Laboratory study of chromosome morphology and behavior as related to problems in genetics.

102. Advanced Genetics. (3) I.

Mr. Jenkins

Lectures, M W, 9; laboratory, M, 1-4.

Prerequisite: Genetics 100.

Genetics with special reference to methods. Intended to supplement Genetics 100 for students whose major is genetics.

103. Organic Evolution. (3) II.

Mr. Stebbins

Lectures, M W F, 9.

Prerequisite: Genetics 100 or equivalent.

The principles of evolution, with particular reference to the evolutionary processes in plants.

104. **Nature and Function of Hereditary Materials.** (3) I. Mr. S. W. Brown
Lectures, M W F, 10.
Prerequisite: Genetics 100 and Chemistry 8, or their equivalents. Recommended: general cytology.
An introduction to modern concepts in biochemical and physiological genetics and their applications in related fields.
105. **Population Genetics.** (3) II. Mr. Lerner, Mr. Dempster
Lectures, Tu Th, 8; laboratory, M, 1-4.
Prerequisite: elementary genetics and statistics, including analysis of variance. Recommended: Genetics 102.
A study of the genetic forces operating in artificial selection. Discussion and formulation of breeding plans on the basis of the principles of population genetics with special reference to animals.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Clausen in charge)

GRADUATE COURSES

- 200A-200B. **Research in Genetics.** (1-6; 1-6) Yr.
The Staff (Mr. Clausen in charge)
- 201A-201B. **Staff Seminar in Genetics.** (No credit) Yr.
Tu, 4-6. The Staff (Mr. Clausen in charge)
Weekly meetings for presentation of special topics by members of the staff, visiting investigators, and graduate students.
- 202A-202B. **Graduate Seminar in Genetics.** (1-4; 1-4) Yr.
M, 4-6. The Staff (Mr. Clausen in charge)
Prerequisite: graduate standing in genetics.
Intensive study of special topics, under supervision of some member of the staff.

HOME ECONOMICS

Students must maintain at least a grade C average to qualify for enrollment in upper division courses in this department.

GENERAL

- 1A-1B. **Experimental Food Study.** (3-3) Yr. Miss Kennedy
Lecture, F, 1. Laboratory: Sec. 1, M W, 1-4; Sec. 2, Tu Th, 9-12.
Prerequisite: Chemistry 1A and 8. Recommended: Bacteriology 1 or 2.
Production and composition of food and principles involved in food preparation and preservation.
6. **Introduction to Textiles.** (3) II. Miss Jones
(Formerly numbered 7.)
Lectures, M W, 8. Laboratory: Sec. 1, Tu, 9-12; Sec. 2, F, 9-12.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.

- 7. Elementary Clothing Study. (3) I.** Miss McClelland
(Formerly numbered 5.)
Lecture: Sec. 1, Tu, 9; Sec. 2, Th, 9; Sec. 3, Th, 9. Laboratory: Sec. 1, M W, 9-12; Sec. 2, Tu Th, 1-4; Sec. 3, M W, 1-4.
Prerequisite: Decorative Art 16A-16B.
Practical and cultural problems in modern garment design and construction.
- 10. Elementary Nutrition. (2) I and II.** Mrs. Cook
Lectures, Tu Th, 9.
A nontechnical presentation of the modern knowledge of foods and nutrition. Not accepted as part of the general major in home economics.
- 12. Euthenics. (2) I and II.** Miss Bremner
Lectures, Tu Th, 10.
A study of the function of the family and the homemaker in modern society, and of the contributions of the basic sciences and arts to the solution of present-day problems of the individual and the family.
- 14. Consumer Problems. (2) II.** Miss Coles
Lectures, M W, 4.
A nontechnical discussion of consumers' problems, including income apportionment, consumer credit, buying aids, and protection of consumers. Not accepted as part of the general major in home economics.

FOOD ECONOMICS AND TECHNOLOGY

- 100. Food Economics. (3) I.** Miss Bremner
Lectures, Tu Th, 1; laboratory or field work, Tu, 2-5.
Prerequisite or concurrent: Home Economics 1A-1B, 141.
Field observation of manufacturing and distribution to observe practices related to problems of consumers including those buying foods in large quantities. Laboratory study of qualities of food in relation to use and price.
- 101A. Food Analysis. (3) I.** Miss Kennedy
Lecture, Tu, 8. Laboratory: Sec. 1, Tu Th, 9-12; Sec. 2, Tu Th, 1-4.
Prerequisite: Home Economics 1A-1B, Chemistry 1B and 8; or Chemistry 1B and 8 with grade of A or B.
The principles of quantitative analysis applied to food materials; chemical analysis of typical carbohydrate, fat, and protein foods.
- 101B. Advanced Food Analysis. (3) II.** Miss Kennedy
Lecture, Tu, 10; laboratory, Tu Th, 1-4.
Prerequisite: Home Economics 101A or Chemistry 5 with a grade of A or B.
Official analytical methods and legal standards used in the chemical analysis of sugars, grain products, dairy products, fats and oils, meats, etc. Examination of foods for deterioration and adulteration.
- 105. Food Composition and Experimental Cooking. (3) II.** Miss Kennedy
Lecture, W, 8; laboratory, M W, 9-12.
Prerequisite: Chemistry 1A and 8, and a college course in food preparation. Recommended: Bacteriology 1 or 2.
An introduction to the chemistry and technology of food composition and production and the principles of food preparation.
The course is designed to meet the needs of transfer students and may be substituted by these students for Home Economics 1A-1B.

- *108. **Introduction to Research in Food Preparation and Control.** (2) II.
 (Formerly numbered 126.) Miss Kennedy
 Two laboratory periods a week to be arranged. To be taken concurrently with Home Economics 109.
- *109. **Recent Advances in Food Technology.** (2) II. Miss Kennedy
 (Formerly numbered 125.)
 F, 9-11.
 Prerequisite: Home Economics 101A.
 A proseminar on late research in the chemistry of food composition, preparation and control.

NUTRITION AND DIETETICS

111. **Nutrition.** (3) I. Mrs. Cook
 (Formerly numbered 103.)
 Lectures, M W F, 10.
 Prerequisite: Chemistry 1A or high school chemistry and Physiology 1.
 A brief study of the essential nutrients and their functions in nutrition. How to determine and satisfy the food needs of the normal individual. Not open to students who have credit for Home Economics 10, and not accepted as part of the work in the general major of home economics.
- 112A-112B. **Nutrition and Dietetics.** (3-3) Yr. Miss Okey
 (Formerly numbered 102A-102B.)
 Lectures, M W, 11; laboratory, F, 1-4.
 Prerequisite: Chemistry 1A and 8, Physiology 1, and Home Economics 1A-1B.
 The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease. The planning and computation of diets.
114. **Laboratory Methods in Metabolism.** (3) II. Miss Okey
 (Formerly numbered 106.)
 Lecture, Tu, 10; laboratory, M W, 1-4.
 Prerequisite: Home Economics 101A or Chemistry 5, Biochemistry 103 taken previously or concurrently.
 Study of qualitative and quantitative reactions and procedures used in the analysis of biological materials of importance in nutrition.
115. **Therapeutic Dietetics.** (3) II. Mrs. Cook
 (Formerly numbered 196.)
 Lectures, M W, 8; laboratory, F, 9-12.
 Prerequisite or concurrently taken: Home Economics 118A-118B.
 Problems in the planning and computation of dietaries for normal and pathological conditions.
- 118A-118B. **Human Nutrition.** (4-5) Yr. Mrs. Morgan, Miss Arnrich
 (Formerly numbered 120A-120B.)
 Lectures, Tu Th, 11; laboratory, M W, 9-12. For 120B, an additional laboratory period F, 9-12 or F, 1-4.
 Prerequisite: Home Economics 101A and Biochemistry 103, or Home Economics 101A and 114.
 The fundamentals of nutrition established through typical experiments in calorimetry, digestion, nitrogen and mineral balances, vitamin tests; and the applications of these principles to practical feeding problems.

* Not to be given, 1949-1950.

130. **The Nutrition of Development.** (2 or 3) II. Mrs. Morgan
 Two lectures; 1 laboratory period or field trip.
 Prerequisite: Home Economics 118A or Biochemistry 103. The lectures may be taken separately with a credit value of two units.
 The chemistry and physiology of intrauterine development, lactation, and growth; normal and subnormal nutrition in infancy and childhood; practice in the solution of feeding problems.

INSTITUTION ECONOMICS

121. **Institution Food Study.** (4) I. Miss Gillum, Miss Straight
 (Formerly numbered 110.)
 Lectures, Tu Th, 9. Laboratory: Sec. 1, Tu, 3-6, S, 9-12; Sec. 2, Th, 3-6, S, 9-12.
 Prerequisite: Home Economics 1A-1B, 100, and 141.
 The principles and problems involved in the preparation and service of food in institutions.
122. **Institution Organization and Management.** (3) II.
 (Formerly numbered 111.) Miss Gillum, Miss Straight
 Lectures, Tu Th, 10; laboratory, S, 9-12.
 Prerequisite: Home Economics 121 or permission of instructor. Recommended: Business Administration 1A, 151, or Psychology 3 or 185.
 The principles and problems involved in the organization and management of institution households, such as residence halls, hospitals, hotels.
- 128A-128B. **Proseminar in Hospital Dietetics.** (2-2) Yr. Miss Gillum
 (Formerly numbered 198A-198B.)
 W, 2-4.
 Open only to selected graduate students. Given on the San Francisco campus.

PROFESSIONAL COURSES

426. **Hospital Problems.** (2) I and II. Miss Gillum
 (Formerly numbered 497.)
 Supervised practice in administrative problems of the hospital dietetic service carried on during residence in Berkeley and open only to selected graduate students.
427. **Hospital Dietetics.** (6) I and II. Miss Gillum
 (Formerly numbered 498.)
 Conferences and supervised practice in the dietetics department of the University of California Hospital and clinics.
 Open only to selected graduate students.

CHILD DEVELOPMENT

132. **Child Psychology.** (3) II. Miss Landreth
 Lectures, M W F, 8.
 Prerequisite: Psychology 1A and 5. Not open to students who are taking or have taken Psychology 112, which is accepted as equivalent to 132 in the general home economics major.
 A study of the factors concerned in the motor, sensory, language, mental, emotional, and social development of young children.

133. **Laboratory in Child Development.** (1) II. Miss Landreth
Lecture, M, 4; observation to be arranged, 3 hours, one day a week.
Prerequisite or concurrent: Home Economics 132.
Laboratory supplement to Home Economics 132 conducted at the nursery school.
- *134. **Child Care.** (3) I. Miss Landreth
Lectures, M W F, 11.
Prerequisite: Physiology 1A, and prerequisite or concurrent for non-home economics majors: Home Economics 10 or 103.
A consideration of the physical development of children from prenatal through adolescent life and the factors affecting health during this period.
135. **Techniques with Young Children.** (3) I and II. Miss Landreth
Lectures, Tu Th, 8; laboratory in the nursery school two mornings or two afternoons a week.
Prerequisite or concurrent: Home Economics 132 and 133, or Psychology 112 and 116.

PROFESSIONAL COURSE

435. **Nursery School Administration.** (3) I. Miss Landreth
Lectures, Tu, 7-9 p.m.; 1 field work period.
The principles and problems involved in nursery school administration.

FAMILY ECONOMICS

140. **Home Management.** (3) II. Miss Bremner
Lectures, Tu Th, 9; laboratory, Th, 1-4.
Prerequisite: Physiology 1 and Psychology 1A.
Use of time, energy, and equipment in the home from the viewpoint of the satisfaction of members of the family.
- 140L. **Home Management Laboratory.** (1-3) II. Miss Bremner
Prerequisite: Home Economics 140. Laboratory which includes home projects or living for 6 to 8 weeks in the home management house under the supervision of the instructor. A two-hour weekly conference to be arranged.
141. **Consumers and the Market.** (3) I. Miss Coles
Lectures, M W F, 8.
Prerequisite or concurrent: Economics 1A-1B.
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
Not open to students who are taking or have taken Agricultural Economics 101A or Business Administration 123.
142. **Social Problems of Families.** (3) II. Miss Coles
Lectures, M W F, 9.
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Present-day problems of families as they are related to economic and social conditions.
144. **Family Finance.** (3) I. Miss Coles
Lectures, M W F, 9.
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

* Not to be given, 1949-1950.

HOME FURNISHING

152. **Home Furnishing.** (3) II. Mr. Sands
 (Formerly numbered 190.)
 Lectures, Tu Th, 10-12.
 Prerequisite: Decorative Art 16A-16B, 130A-130B. One of the latter may be taken concurrently.
 A nonprofessional course designed to develop discrimination in values. A consideration of materials involved in furnishing the home and their use, and an analysis of current trends and available materials.

CLOTHING AND TEXTILES

160. **Textiles.** (3) I. Miss Jones
 Lecture, Th, 8; laboratory, Tu Th, 9-12.
 Prerequisite: Home Economics 6.
 Technical analyses and evaluations of textile fibers and fabrics.
162. **Clothing Economics.** (3) I. Miss Jones
 Lectures, M W, 12; laboratory, W, 1-4.
 Prerequisite: Home Economics 6 and Economics 1A-1B.
 The problems involved in the selection, purchase, and care of household textiles and of clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries.
175. **Advanced Clothing** (3) II. Miss McClelland
 (Formerly numbered 167.)
 Lecture, Tu, 8. Laboratory: Sec. 1, Tu Th, 1-4; Sec. 2, M W, 9-12.
 Prerequisite: Home Economics 6 and 7.
 Wardrobe planning and problems in advanced clothing construction.
176. **Dress Design and Fashion Analysis.** (3) II. Miss McClelland
 (Formerly numbered 163.)
 Lecture, Th, 8. Laboratory: Sec. 1, M W, 1-4; Sec. 2, Tu Th, 9-12.
 Prerequisite: Home Economics 7.
 The design, draping, and construction of costumes based on the principles of design and color theory; past and current fashion trends and fashion merchandising methods.

SPECIAL STUDIES APPLYING TO EACH MAJOR

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
 The Staff (Mrs. Morgan in charge)

GRADUATE COURSES

202. **Seminar in Foods and Nutrition.** (2) I. Miss Okey
 (Formerly numbered 216.)
 F, 9-11.
- *212. **Seminar in Nutrition.** (2) II. Mrs. Morgan
 (Formerly numbered 219.)
 Tu, 4-6.
218. **Research in Food and Nutrition.** (2-6) I and II.
 (Formerly numbered 214.) The Staff (Mrs. Morgan in charge)

* Not to be given, 1949-1950.

238. **Research in Home Economics.** (2-6) I and II.
The Staff (Mrs. Morgan in charge)
242. **Seminar in Family Economics.** (2) II. Miss Coles
One 2-hour period.

HORTICULTURE

2. **Fruit Growing.** (3) I. Mr. Griggs
Lectures, Tu Th, 11, Th, 2.
Prerequisite: Botany 1 or 12.
Fruit growing practices; propagation, planting, and culture of orchard trees and small fruits.
NOTE: Given in the fall semesters of odd-numbered years.

LANDSCAPE DESIGN

- 1A-1B. **Elementary Design and Theory.** (3-3) Yr.
Lectures, M, 10; laboratory, W S, 9-12. Mr. Royston, Mr. Vaughan
Prerequisite: Architecture 1 or equivalent, and consent of the instructor.
The analysis and solution of typical site problems.
2. **History and Literature of Landscape Design.** (2) I. Mr. Vaughan
Lectures, M W, 11.
Study and analysis of landscape design through the ages, with emphasis on its relation to climate, topography, and society in various times and localities. Limited to major student in landscape design.
49. **Summer Travel and Observation Course.** (No credit).
The Staff (Mr. Vaughan in charge)
Six weeks of field trips, study, and analysis of outstanding works in site planning and landscape design throughout Central California. Limited to major students in landscape design.

Art 2A-2B or Decorative Art 16A-16B, Botany 12 or 1, Architecture 1 and 2, Engineering 21, Landscape Design 1A-1B and 2 are prerequisite to all upper division courses in landscape design.

- 101A-101B. **Intermediate Design and Theory.** (3-3) Yr.
Lecture, M, 10; laboratory, W, 8-11, 1-4. Mr. Vaughan, Mr. Royston
Specific problems in the design of residential homesites, parks, and general public areas.
- 111A-111B. **Landscape Design and Construction.** (4-4) Yr. Mr. Cirino
Lecture, F, 11; laboratory periods and field trips, F, 9-11, 1-5, Tu, 3-6.
Problems of design and construction, with special reference to grading, retaining walls, steps, pools, garden structures, fences, irrigation and drainage systems; reports and estimates.
- 112A-112B. **Plant Materials and Planting Design.** (3-3) Yr. Mr. Shepherd
Lecture, Tu, 8; laboratory periods and field trips, Tu, 9-12, Th, 8-11.
The form, habit, texture, and adaptation of coniferous, deciduous, and evergreen shrubs, broadleaf and coniferous trees.
- 113A-113B. **Plant Materials and Planting Design.** (3-3) Yr. Mr. Shepherd
Lecture, M, 1; laboratory periods and field trips, M, 2-5, W, 2-5.
The form, habit, and adaptation of alpiners, succulents, palms, tropical plants, natives, vines, and deciduous trees.

114A-114B. Advanced Design and Theory. (4-4) Yr.

Mr. Royston, Mr. Vaughan

Lecture, Tu Th, 3; laboratory, Tu Th, 4-6, F, 9-12, 1-4.

Prerequisite: Landscape Design 101A-101B.

Specific problems of design and construction in large areas.

115A-115B. City and Town Planning. (4-4) Yr.

Mr. Vaughan, Mr. Royston

Lecture and laboratory periods to be arranged.

Specific problems in design of public use areas.

116. Site Planning. (4) II.

Mr. Royston

Lecture and laboratory periods and field trips to be arranged.

Prerequisite: junior standing in architecture or landscape design, and consent of the instructor.

A study of the development of irregular topography for building groups and their attendant outdoor elements.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. Vaughan in charge)

GRADUATE COURSE

201A-201B. Graduate Design and Theory. (1-6; 1-6) Yr.

The Staff (Mr. Vaughan in charge)

Advanced problems and research.

PLANT NUTRITION

GRADUATE COURSES

(For undergraduate courses in Plant Nutrition, see Soil Science)

201A-201B. Research. (1-9; 1-9) Yr.

Mr. Arnon, Mr. Barker, Mr. Bennett, Mr. Hassid,

Mr. Hoagland, Mr. Stout, Mr. Stumpf

Prerequisite: qualified graduate students, with consent of the instructor.

Research on problems of plant nutrition and plant biochemistry.

202. Seminar in Carbohydrate Chemistry. (1) II.

Mr. Hassid

M, 4.

Prerequisite: consent of the instructor.

Seminar in advanced carbohydrate chemistry, with special reference to plant science.

203A-203B. Seminar in Plant Biochemistry. (1-1) Yr.

Th, 4.

Mr. Barker, Mr. Hassid, Mr. Stumpf

Prerequisite: qualified graduate students, with consent of the instructor.

Seminar on problems of plant nutrition and plant biochemistry.

235A-235B. Staff Seminar in Plant Nutrition. (No credit) Yr.

Alternate Saturdays, 10:30-12. The Staff (Mr. Arnon in charge)

PLANT PATHOLOGY

100. **Forest Pathology.** (3) II. Mr. Hansen
Lectures, M F, 11. Laboratory: Sec. 1, F, 1-4; Sec. 2, S, 9-12.
Prerequisite: Botany 1 or 12 and 16. Restricted to forestry students.
Diseases of forest plants.
120. **Plant Diseases.** (4) I. Mr. Yarwood
Lectures, Tu Th, 8. Laboratory: Sec. 1, Tu Th, 9-12; Sec. 2, Tu Th, 2-5.
Prerequisite: Botany 1 or 12 and 16, and Bacteriology 1.
A general course on the nature, cause, and control of plant diseases.
121. **Technique of Plant Pathology.** (2) II.
Laboratory, Tu Th, 1-4. Mr. Rawlins, Mr. Ark, Mr. Takahashi
Prerequisite: Plant Pathology 120.
(a) Histology; phytopathological technique. (b) Application of histo-
chemical methods to the study of diseased plant tissues.
NOTE.—May be repeated once without duplication of credit (maximum, 4
units). Part (a) to be given in 1949-1950.
123. **Principles of Plant Pathology.** (2) II. Mr. Thomas, Mr. Wilhelm
Lectures, Tu Th, 10.
Prerequisite: Plant Pathology 120.
A consideration of some of the principles broadly applicable to fungus,
bacterial, virus, and nutritional diseases of plants.
- *125. **Diseases of Truck and Field Crops.** (2) I. Mr. Gardner, Mr. Snyder
Laboratory, M W, 1-4.
Prerequisite: Plant Pathology 120.
The pathology of important crop plants. Dissemination, factors influencing
inception and severity of disease, diagnosis, host reaction, etiology, control.
NOTE.—This course is given in alternate years. To be given in 1950-1951.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Ark, Mr. Gardner, Mr. Hansen, Mr. Rawlins, Mr. Snyder,
Mr. Thomas, Mr. Wilhelm, Mr. Yarwood

GRADUATE COURSES

- 201A-201B. **Seminar in Plant Pathology.** (1-1) Yr.
M, 4. The Staff (Mr. Thomas in charge)
- 230A-230B. **Research in Plant Pathology.** (1-9; 1-9) Yr.
Mr. Ark, Mr. Gardner, Mr. Hansen, Mr. Rawlins, Mr. Snyder,
Mr. Takahashi, Mr. Thomas, Mr. Wilhelm, Mr. Yarwood

POMOLOGY

(For courses in Pomology, see Horticulture)

POULTRY HUSBANDRY

1. **Poultry Production.** (3) I. Mr. Grau
Lectures, Tu Th, 10. Laboratory: Sec. 1, Tu, 2-5; Sec. 2, F, 2-5.
An introductory study of the relation of the several sciences underlying
poultry production to flock management.

* Not to be given, 1949-1950.

102. **Experimental Incubation.** (3) II. Mr. L. W. Taylor
Lectures, Tu Th, 9; laboratory to be arranged.
Prerequisite: Zoölogy 100, Chemistry 8.
Problems of embryonic development, causes of embryonic mortality in poultry, and principles of artificial incubation.
103. **Poultry Breeding.** (3) I. Mr. L. W. Taylor, Mr. Lerner
Lectures, M W F, 10.
Prerequisite: Genetics 100.
Inheritance of characters in poultry and study of the application of genetic principles to problems in poultry breeding.
104. **Poultry Feeds and Feeding.** (3) I. Mr. Lepkovsky
Lectures, Tu Th, 11; laboratory to be arranged.
Prerequisite: Poultry Husbandry 106 (completed or in progress).
A study of the manufacture, composition, and use of poultry feedstuffs; elementary feed analysis.
106. **Principles of Animal Nutrition.** (3) I. Mr. Lepkovsky
Lectures, M W F, 9.
Prerequisite: Chemistry 8, Zoölogy 1B, Physiology 1A, 1C, or Animal Husbandry 110.
Not open to students who have had Animal Husbandry 101 at Davis.
The fundamentals of metabolism, maintenance, growth, and reproduction; chemistry and digestion of the proteins, carbohydrates, and fats; functions of minerals, vitamins, and water.
NOTE.—This course may be elected by students in the Curriculum of Animal Science on the Berkeley campus to meet requirements in biochemistry.
- Poultry Hygiene.** (See Veterinary Science 101.)
- Poultry Farm Finance.** (See Agricultural Economics 110.)
- Poultry Farm Organization and Administration.** (See Agricultural Economics 118 and 119.)
- Marketing Poultry Products.** (See Agricultural Economics 101A-101B, 104, and 199.)
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. L. W. Taylor in charge)
Prerequisite: Poultry Husbandry 1, courses basic to problems elected, and consent of the instructor.
Problems relating to the nutrition, breeding, incubation, physiology, or egg and meat quality of chickens may be elected.

GRADUATE COURSE

- 200A-200B. **Research in Poultry Husbandry.** (1-6; 1-6) Yr.
Mr. L. W. Taylor, Mr. Bouthilet, Mr. Grau, Mr. Lepkovsky, Mr. Lerner

SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained at least an average of grade C in each of the fields of required courses in chemistry, physics, botany, bacteriology, and the geological sciences.

SOIL MORPHOLOGY AND SOIL PHYSICS

100. **Soil Characteristics.** (4) I. Mr. Bodman, Mr. Day
Lectures, M W F, 11. Laboratory: Sec. 1, M, 1-4, Sec. 2, Tu, 1-4, Sec. 3, W, 1-4, Sec. 4, Th, 1-4; other sections may be arranged.
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, Geology 1.
An introduction to the physical and chemical properties of the soil.
101. **Development and Morphology of Soils.** (3) II. Mr. Jenny
Lectures, M W F, 10.
Prerequisite: Geology 1, Chemistry 1A-1B. Soil Science 100 recommended.
Influence of climate, vegetation, parent material, topography, and time on soil development; chemistry of soil formation; classification of soils; relationships between soil groups and agricultural use; developed and illustrated by a critical study of representative soils of the world.
102. **Soil Physics.** (2) II. Mr. Bodman
Lectures, Tu Th, 9.
Prerequisite: Soil Science 100, including laboratory; calculus (Mathematics 3A-3B or 11A-11B). Recommended: physical chemistry. Soil Science 102L should be taken concurrently.
The physical properties of soils and their measurement.
- 102L. **Soil Physics.** (2) II. Mr. Day, Mr. Bodman
Laboratory, Tu Th, 2-5.
Prerequisite or concurrent: Soil Science 102.
Laboratory experiments designed to accompany course 102.
103. **Soils of California.** (3) I. Mr. Storie
Lectures, Tu Th, 10. Discussion: Sec. 1, Tu, 11; Sec. 2, Th, 8; Sec. 3, Th, 11; Sec. 4, Tu, 9. Two field trips during the semester to be arranged.
Prerequisite: Geology 1, Chemistry 1A-1B.
The general character, mode of formation, classification, geography, use, and conservation of the soil resources of the State. Practice in identifying, rating, and judging the probable agricultural value of the important soils in California.
105. **Summer Field Course.** (6) Six weeks, daily, 8-5. Mr. Storie
Prerequisite: Soil Science 100, and 101 or 103, and approval of instructor in charge.
Methods of mapping and classifying soils; the preparation of soil reports; field work in soil surveying and field studies of the profiles of representative California soils.

SOIL CHEMISTRY, SOIL MICROBIOLOGY, AND PLANT NUTRITION

110. **The Soil as a Medium for Plant Growth.** (4) I. Mr. Stout, Mr. Overstreet
Lectures, M W F, 9. Conferences: Sec. 1, F, 10; Sec. 2, F, 11.
Prerequisite: Chemistry 1A-1B, 8; Geology 1 recommended.
Composition and properties of soils; factors determining productivity; the causes and effects of the soil's reaction, with particular reference to "acid" and "alkali" soils; the nature of fertilizers and some of their effects upon soil and plant; current theory of the soil solution.

111. **Soil Microbiology.** (2) II. Mr. Barker
Lectures, W F, 1.
Prerequisite: Chemistry 5 and 8, Bacteriology 1 or 2.
The role of microorganisms in nature, particularly in relation to agriculture.
112. **Soil Chemistry in Relation to Plant Growth.** (2) II.
Lectures, Tu Th, 10. Mr. Stout, Mr. Overstreet
Prerequisite: Soil Science 110 and Chemistry 5.
Soil conditions as phenomena and in relation to factors influencing fertility; liquid and solid phases of the soil, including absorption phenomena, base exchange and buffer effects.
113. **Soil Chemistry in Relation to Plant Growth.** (2) II.
Laboratory, Tu Th, 1-4. Mr. Overstreet, Mr. Stout
Prerequisite: Chemistry 5, Soil Science 112, to be taken concurrently.
114. **Properties of Colloids.** (3) II. Mr. Jenny
Lectures with demonstrations, M W F, 11.
Prerequisite: physical chemistry.
Properties of colloidal systems of importance in agriculture and biology. Chemistry and physics of surfaces (adsorption, ion interchange), electric double layer, flocculation, Brownian movement, colloid optics, viscosity, swelling.
115. **Mineral Nutrition of Plants.** (2) II. Mr. Hoagland, Mr. Arnon
Lectures, Tu Th, 11.
Prerequisite: Botany 111.
Designed for students in soil science and certain other curricula in agriculture and for students in botany. Among the principal subjects of discussion are the following: nutrient medium in relation to inorganic and organic composition of plants; nitrogen metabolism; deficiency diseases; effects of inorganic elements on physiological processes; toxicities of mineral elements; certain relations of plant nutrition to animal nutrition; special phases of absorption and accumulation of mineral elements, including methods of experimentation.
116. **Soil Management.** (2) I. Mr. Bodman in charge
One 2-hour period.
Prerequisite: senior standing in soil science.
Evaluation of soil fertility by field experiments; use of fertilizers; cultivation practices; aspects of soil erosion control. Lectures, discussions, and demonstrations by various specialists.
- Plant Biochemistry.** (See Botany 122, 123 in the GENERAL CATALOGUE, DEPARTMENTS AT BERKELEY.)

GENERAL SOIL SCIENCE

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Arnon, Mr. Barker, Mr. Bodman, Mr. Day, Mr. L. E. Davis,
Mr. Jenny, Mr. Overstreet, Mr. Storie, Mr. Stout
Open only to students with an average grade of B or better, and subject to approval of the undergraduate adviser in soil science.

GRADUATE COURSES

201A-201B. **Research in Soil Science.** (1-9; 1-9) Yr.

Mr. Arnon, Mr. Barker, Mr. Bodman, Mr. L. E. Davis, Mr. Day,
Mr. Jenny, Mr. Overstreet, Mr. Stout

235. **Seminar.** (1) I.

Mr. Jenny

Prerequisite: graduate standing in soil science, plant physiology, or related subjects.

236A-236B. **Staff Seminar in Soil Science.** (No credit)

The Staff

SUBTROPICAL HORTICULTURE

For announcement of courses in this field, see under Horticulture, pages 127, 158, and 187, or under Subtropical Horticulture, page 183, or the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES.

TRUCK CROPS

*1. **Vegetable Production.** (3) II.

Mr. MacGillivray

Lectures, Th, 1-4.

Principles involved in vegetable production; survey of the vegetable industry.

NOTE.—Given in the spring semesters of odd-numbered years.

VETERINARY SCIENCE

*101. **Poultry Hygiene.** (3) II.

Mr. Beach, Mr. DeOme, Mr. Bankowski

Lectures and laboratory, M W, 2-5.

Prerequisite: Bacteriology 1 and 4 (completed or in progress) or Bacteriology 1 (Davis); Physiology 1A and 1C or Animal Husbandry 110 (Davis).

A study of the principles of pathology and measures for the maintenance of health of poultry.

NOTE.—Given each fourth semester. In addition to Entomology 117, it meets the requirement of parasitology and animal pathology in the Animal Science Curriculum for poultry majors resident at Berkeley.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.

Mr. Traum, Mr. Schalm, Mr. DeOme, Mr. Bankowski, Mr. Beach

Prerequisite: courses basic to the problem elected, and consent of instructor.

GRADUATE COURSE

200A-200B. **Research in Animal Pathology.** (1-6; 1-6) Yr.

Mr. Traum, Mr. Schalm, Mr. DeOme, Mr. Bankowski, Mr. Beach

NOTE.—Research in poultry diseases may be elected in the above courses.

* Not to be given, 1949-1950.



A student in home economics working on an experimental food program, Davis campus

1949-1950
COURSES OF INSTRUCTION
OFFERED AT DAVIS

COURSES OFFERED ON THE DAVIS CAMPUS‡

AGRICULTURAL CHEMISTRY

GRADUATE COURSES

*200A-200B. Seminar in Agricultural Chemistry. (1-1) Yr.

The Staff (Mr. Young in charge)

Members of the Group in Agricultural Chemistry at Davis.†

One seminar is offered during each semester. One weekly meeting is held. The subject will vary from semester to semester and will be announced at the beginning of each one.

201A-201B. Research in Agricultural Chemistry. (1-6; 1-6) Yr.

The Staff (Mr. Reiber in charge)

Members of the Group in Agricultural Chemistry.†

The research work will ordinarily be under the direction of a member of the instructing staff, who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

2. Agricultural Cooperatives. (3) II.

Mr. Robinson

Lectures, M W F, 9.

Types of cooperative agencies; scope and objectives of agricultural cooperation; functions; supply, services, insurance, irrigation, production, consumption, marketing; problems of organization, pooling, management, member relations, financing, taxation, market control, demand creation, cost control; economic effects; legal, political, social aspects.

49. Field Practice. (1-6) I and II. The Staff (Mr. Mehren in charge)

Field trips to observe economic aspects of production, processing, handling, or marketing of California agricultural products. Various areas and problems—such as management, tenure, financing, taxation, labor practices, market functions, transportation—will be emphasized on the different trips.

An average of at least grade C in all work undertaken is prerequisite to all upper division courses in agricultural economics.

101A. Principles of Marketing Agricultural Products. (3) II. Mr. Mehren

Lectures, M W F, 11.

Prerequisite: Economics 1A-1B.

Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products. Government in its relation to marketing; consideration of proposals for improvement.

Not open to students who have taken Business Administration 123.

103. Agriculture in the American Economy. (3) II.

Mr. Brekke

Lectures, M W F, 10.

Prerequisite: Economics 1A-1B.

The structure of agriculture and of the economy as a whole: organization of production; allocation of resources; short-run cyclical and long-run changes; interrelations between agriculture and other segments of the economy.

‡ See page 105 for explanation of classification and numbering.

* Not to be given, 1949-1950.

† See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

118. **Farm Organization.** (3) I. Mr. Hedges
Lectures, Tu Th, 9; discussion section to be arranged.
The place, purpose, and scope of organization; farm enterprises; selecting farms; planning and equipping; capital needs; earnings.
119. **Farm Management.** (3) II. Mr. Tinley
Lectures, Tu Th, 9; discussion section to be arranged.
Prerequisite: Agricultural Economics 118.
Methods of handling properties; duties and qualifications of managers; bookkeeping and accounting; marketing methods; farm labor; tenancy; farm law.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Mehren in charge)
Prerequisite: senior standing and approval of the division.

AGRICULTURAL ENGINEERING

12. **Survey and Problems in Agricultural Engineering.** (2) II.
Lectures, M W, 8. Mr. Walker, Mr. Bainer
The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.
- 14A-14B. **Farm Mechanics for Teachers.** (2-2) Yr.
Laboratory, M F, 1-4. Mr. Fairbank, Mr. Lewis, Mr. Belton
Selection, use, and care of tools and shop equipment. Practice in the application of mechanical principles to the maintenance and repair of farm buildings, farm machinery, and farm power. Demonstration of methods. A demonstration and laboratory course for majors in agricultural education.
49. **Summer Field Practice.** (6) The Staff (Mr. Perry in charge)
Six weeks' course (first summer session), daily except Sunday, 8-5.
Practice in the mechanics, machinery, power, and building laboratories; study of equipment on typical farms. It should be taken after the sophomore or junior year.

Physics 2A-2B or 4A-4B are prerequisite to all upper division courses in agricultural engineering.

102. **Unit Operations in Processing Agricultural Products.** (3) II.
Lectures, Tu Th, 8; laboratory, W, 1-4. Mr. Perry, Mr. Henderson
Theory of refrigeration, steam, electricity, and hydraulics, and their application to the processing of dairy, meat, fruit, and vegetable products.
103. **Agricultural Power.** (3) II. Mr. Moses, Mr. Lorenzen
Lectures, Tu Th, 11. Laboratory: Sec. 1, W, 1-4; Sec. 2, S, 9-12.
Theory of operation, construction, and utilization of internal combustion engines; tractors; electric motors and appliances; steam engines; water wheels. Open to qualified lower division students by permission.
104. **Agricultural Machinery.** (3) I. Mr. Bainer, Mr. R. A. Kepner
Lectures, Tu Th, 9. Laboratory: Sec. 1, W, 1-4; Sec. 2, S, 9-12.
Construction, operation, requirements, and utilization of tillage, seeding, harvesting, belt-operated farm machinery and pest-control equipment; theory and testing of displacement and centrifugal pumps.

105. **Farm Structures.** (3) I. Mr. Neubauer
Lectures, Tu Th, 11. Laboratory: Sec. 1, W, 1-4; Sec. 2, Th, 1-4.
A course in agricultural housing, including structural materials and methods of construction; design of typical farm dwellings, storage buildings, and production structures; farmstead utilities; farmstead arrangement; plans, specifications, contracts and cost estimating.

106. **Heat Transfer in Agricultural Climatic Environment.** (2) II. Mr. Brooks
Lectures, Tu Th, 9.
Prerequisite: Physics 2A.
Atmospheric and thermal environment of life and structures near the earth's surface. Introduces agricultural climatology and treats solar and nocturnal radiations, thermal convection, diurnal heat flow, cold-air drainage, and frost protection; outdoor condensation and evaporation; dispersion of aerosols.

Courses 113, 114, 115, and 130 are designed for students in the College of Engineering whose major is agricultural engineering; they are not open to students in the College of Agriculture.

113. **Agricultural Power.** (4) II. Mr. Moses, Mr. Lorenzen
Lectures, Tu Th, 8; laboratory, Tu Th, 1-4.
Prerequisite: Mechanical Engineering 105A-105B.
The study of the different types of internal combustion engines, their accessories and fuels used for stationary and mobile power on the farm; the construction, operation, and testing of farm tractors, and the application of electric heat, light, and power to agricultural operations.

114. **Agricultural Machinery.** (3) I. Mr. Bainer, Mr. R. A. Kepner
Lectures, M F, 11; laboratory, F, 1-4.
Prerequisite: Mechanical Engineering 102B and Engineering 35.
The requirements and design of farmstead and field implements; theory of operation and testing of displacement and centrifugal pumps; field and laboratory studies of representative types of draft and belt-operated farm machines, together with their cost, selection, power requirements, and management.

115. **Farm Structures Design.** (3) I. Mr. Neubauer
Lecture, Tu Th, 9; laboratory, Tu, 1-4.
Prerequisite: Engineering 35 and Mechanical Engineering 102B.
The design of farm buildings including houses, storage buildings, and production structures, with emphasis on functional requirements and characteristics of materials. Study of the principles of lighting, air conditioning, water supply, and sanitation.

130. **Proseminar.** (1) II. Mr. F. A. Brooks, Mr. Walker
W, 11.
Professional ethics and social responsibilities of engineers; cooperative research procedures, validity of findings, written and oral presentation of short technical reports.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Bainer in charge)

GRADUATE COURSE

- 200A-200B. **Research in Agricultural Engineering.** (1-6; 1-6) Yr.
Mr. Bainer, Mr. Akesson, Mr. Boelter, Mr. F. A. Brooks, Mr. Fairbank,
Mr. Henderson, Mr. Howe, Mr. R. A. Kepner, Mr. Moses, Mr.
Neubauer, Mr. Perry, Mr. Veihmeyer, Mr. Walker, Mr. Young

MECHANICAL ENGINEERING

151. **Industrial Heat Transfer.** (3) I. Mr. Perry, Mr. Henderson
Lectures, M W F, 8.
Prerequisite: Mechanical Engineering 105A-105B or equivalent.
The study of the basic principles of heat transfer and their application to the design of industrial equipment. Steady-state and transient problems of conduction by analytical and graphical methods. Free and forced convection. Transfer of radiant energy.
- 152A. **Industrial Mass Transfer.** (3) II. Mr. Perry
Lectures, M W F, 8.
Prerequisite: Mechanical Engineering 105A-105B. Mechanical Engineering 151 recommended.
Thermodynamic, heat, and mass transfer principles applied to the unit operations pertaining to processing agricultural products. Analysis and synthesis of processes involving diffusion, evaporation, dehydration, freezing, size reduction, separation, mixing, and materials handling.

AGRONOMY

1. **Introduction to Agronomy.** (3) I. Mr. Allard
Lectures, Tu Th, 9. Laboratory: Sec. 1, W, 1-4; Sec. 2, Th, 1-4; Sec. 3, F, 1-4.
The principles of soil management and field-crop production. History, survey, production methods, and major uses of the field crops of California. Required of all majors in agronomy.
110. **Principles of Crop Production.** (3) I. Mr. Laude
Lectures, M W F, 10.
Prerequisite: Chemistry 8, Botany 1.
The relation of environment to the distribution and utilization of field crops. The theory of soil management and improvement, fertilization, rotation, erosion control, tillage, and other practices relating to the production of field crops.
111. **Field Crops.** (3) I. Mr. Stanford
Lectures, Tu Th, 10; laboratory, W, 1-4.
Prerequisite: Agronomy 110 or consent of instructor.
Adaptation, distribution, utilization, processing, and factors determining quality of cereal, oil, fiber, and sugar crops.
112. **Forage Crops.** (3) II. Mr. Peterson
Lectures, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Agronomy 110 or consent of instructor.
The adaptation, management, and utilization of hay crops, irrigated pastures, and other harvested forages; factors which determine quality and value of forages.

114. **Plant Breeding.** (3) II. Mr. Briggs
Lectures, M W, 10; laboratory, M, 1-4.
Prerequisite: Genetics 100; Agronomy 111, or Botany 110B, or Truck Crops 105 recommended.
The application of genetics to the problems and methods of plant improvement.
115. **Range Plants and Management.** (3) II. Mr. Love
Lecture, F, 10; laboratory, W F, 1-4.
Prerequisite: Agronomy 110.
Adaptation, distribution, and utilization of the more important forage and grazing plants, with special emphasis on their systematic relationships. Principles of the establishment and management of ranges.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Briggs in charge)
Prerequisite: 6 upper division units of agronomy.

GRADUATE COURSE

- 200A-200B. **Research in Agronomy.** (1-6; 1-6) Yr.
Mr. Briggs, Mr. Allard, Mr. Conrad, Mr. Knowles, Mr. Laude,
Mr. Love, Mr. Madson, Mr. Peterson, Mr. Schaller, Mr. F. L. Smith, Mr. Stanford, Mr. Zscheile

ANIMAL HUSBANDRY

7. **Introduction to Animal Husbandry.** (3) I. Mr. Heitman
Lectures, M W F, 8.
A survey of the sources of the world's supply of animal products, the distribution of domestic animals in the United States and factors influencing this; the origin, characteristics, and adaptation of the more important breeds and the influence of environment upon their development.
8. **Livestock Judging and Selection.** (1) I.
Mr. Heitman, Mr. Weir, Mr. Lofgreen
Laboratory: Sec. 1, M, 1-4; Sec. 2, W, 1-4; Sec. 3, F, 1-4.
Prerequisite: Animal Husbandry 7 or taken concurrently.
The animal form in relation to its various functions.
101. **Animal Biochemistry.** (3) II. Mr. Goss
Lectures, M W F, 8.
Prerequisite: Chemistry 8.
The chemistry of animal food constituents, tissues, hormones, and excretory products; chemistry of enzymes and digestion; the fate of food-stuffs in metabolism; survey of fundamentals of blood chemistry.
102. **Animal Biochemistry Laboratory.** (2) I and II. Mr. Goss, Mr. Lofgreen
Laboratory: Sec. 1, Tu Th, 1-4; Sec. 2, W F, 1-4.
Prerequisite: Chemistry 8 and Animal Husbandry 101 taken concurrently.
103. **Animal Nutrition—Feeds and Feeding.** (3) I. Mr. Miller, Mr. Weir
Lectures, M W F, 11.
Prerequisite: Chemistry 8.
The composition and use of feedstuffs in their relation to the feeding of farm animals, including the selection of rations.

107. **Breeding Farm Animals.** (2) II. Mr. Cupps
Lectures, Tu Th, 8.
Prerequisite: Genetics 100.
Underlying principles: inbreeding, line-breeding, and outcrossing; blood lines and pedigrees of famous animals; successful methods of producing purebred stock.
108. **Milk Production.** (4) II. Mr. Regan, Mr. Ralston
Lectures, M W F, 10; laboratory, M, 1-4. Occasional field trips.
Prerequisite: Animal Husbandry 103.
Study of the applications of the principles of heredity, nutrition, and physiology to the problems of breeding, feeding, and management of dairy cattle. Judging of dairy cattle; principles of sanitation.
110. **Physiology of Domestic Animals.** (5) I. Mr. Cole
Lectures, M Tu W F, 10. Laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4; Sec. 3, W, 1-4.
Prerequisite: Chemistry 8, Zoölogy 1A-1B.
The physiology of the neuromuscular, central nervous, circulatory, respiratory, digestive, endocrine, reproductive, and excretory systems.
111. **Advanced Livestock Judging.** (2) I. Mr. Hughes, Mr. Weir
Laboratory, W, 1-4; S, 9-12. Occasional field trips.
Prerequisite: Animal Husbandry 7 and 8.
The relation of form to function. Training in the selection of beef cattle, sheep, hogs, and horses.
112. **Advanced Dairy Cattle Production.** (2) I. Mr. Mead, Mr. Regan, Mr. Ralston
Laboratory, Tu Th, 1-4. Occasional field trips.
Prerequisite: Animal Husbandry 103.
A study of the factors involved in developing successful breeding and management programs. The relation of form to function.
113. **Wool Technology.** (3) I. Mr. J. F. Wilson
Lectures, Tu Th, 11; laboratory, Th, 1-4. Occasional field trips.
Prerequisite: Animal Husbandry 7 and 8, and Genetics 100.
A survey of world production and consumption of wool; a study of the physical structure and properties of wool and other textile fibers; preparation and marketing of the clip; determination of wool values; grading, scouring, drying; principles of manufacture.
115. **Horse Production.** (3) II. Mr. Howell, Mr. Cupps
Lectures, M W F, 9.
Prerequisite: Animal Husbandry 103.
Care, feeding, management, and problems of production of all classes of horses. Developing successful breeding programs. The use of horses for power and pleasure.
118. **Meat Production.** (4) II. Mr. Guilbert, Mr. Heitman, Mr. R. F. Miller
Lectures, M W F, 8; laboratory, S, 9-12. Occasional field trips.
Prerequisite: Animal Husbandry 103.
The relation of natural environment, heredity, nutrition, and physiology to breeding, feeding, and management of meat-producing animals and to the quality of meat products; with study of the economic phases of meat distribution.

Animal Parasites and Diseases. (See Veterinary Science 111 and Entomology 116.)

120. Advanced Animal Nutrition. (3) I.

Mr. Kleiber

Lectures, M W F, 8.

Prerequisite: Animal Husbandry 101.

Physical, chemical, and physiological aspects of total starvation, partial starvation (dietary deficiencies), and abundant food intake. Relation of food intake to essential animal functions, particularly metabolism, growth, reproduction, lactation, and work. Food utilization and food value.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. Hughes in charge)

GRADUATE COURSES

200A-200B. Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics. (1-6; 1-6) Yr.

Mr. Hughes, Mr. Cole, Mr. Cupps, Mr. Goss, Mr. Gregory, Mr. Guilbert, Mr. Heitman, Mr. Howell, Mr. Kleiber, Mr. Lofgreen, Mr. Mead, Mr. R. F. Miller, Mr. Ralston, Mr. Regan, Mr. Rollins, Mr. Storer, Mr. Weir, Mr. J. F. Wilson, Mr. Young

201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr.

The Staff (Mr. Hughes in charge)

BACTERIOLOGY

1. Introductory Bacteriology and Microbiology. (5) II.

Mr. Starr, Mr. Reynolds

Lectures, M W F, 10; laboratory, Tu Th, 1-4.

Prerequisite: Chemistry 1A, 8; one course in botany, zoölogy, or physiology (Botany 1 or 12, Zoölogy 1A or 10, Physiology 1A, or equivalent).

A general introduction to microbiology suggested for students majoring in bacteriology and in closely related fields.

2. General Bacteriology. (4) I.

Mr. Mudge

Lectures, M W F, 11. Laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4; Sec. 3, W, 1-4.

Prerequisite: Chemistry 1A; Botany 1 or 12 or Zoölogy 1A or 10.

Morphology, classification, ecology, and metabolism of microorganisms; preparation of culture media; microscopic examination, cultivation, and identification of bacteria; introduction to microbiology of air, water, soil, foods (including milk), industrial processes, and certain human, animal, and plant diseases.

103. Microbial Metabolism. (2) II.

Mr. Starr

Lectures, Tu Th, 8.

Prerequisite: Bacteriology 1 or 2; a course in biochemistry (Chemistry 101, Animal Husbandry 101, or equivalent).

A survey of the metabolic activities of microbes.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Mudge in charge)
Prerequisite: consent of the instructor based on adequate preparation of the student in allied fields.
Investigation of special problems.

GRADUATE COURSES

200. **Research in Bacteriology.** (1-6) I and II.
The Staff (Mr. Mudge in charge)
- 201A-201B. **Seminar in Bacteriology and Microbiology.** (1-1) Yr.
The Staff (Mr. Mudge in charge)

BOTANY

1. **General Botany.** (5) I and II.
Mr. Robbins, Mr. Weier, Mr. Stocking, Mr. Currier, Mr. Tucker
I. Lectures, M W F, 10. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4;
Sec. 3, W, 1-4, S, 9-12; Sec. 4, Tu Th, 9-12.
II. Lectures, M W F, 10. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4.
An introduction to the morphology, physiology, and genetics of flowering plants; brief survey of fungi causing plant diseases.
2. **Plant Morphology.** (4) II. _____
Lectures, Tu Th, 11; laboratory, Tu Th, 1-4.
Prerequisite: Botany 1.
Survey of plant groups; morphology of the vegetative and reproductive structures of Thallophyta, Bryophyta, and Tracheophyta.
7. **Introduction to Plant Physiology.** (4) II. Mr. Stocking
Lectures, M W F, 11. Demonstration: Sec. 1, Th, 9; Sec. 2, Th, 10;
Sec. 3, Th, 11.
Prerequisite: Botany 1, Chemistry 1A-1B; Chemistry 8 recommended.
The fundamental activities of plants, such as absorption, transpiration, synthesis of foods, respiration, growth, movement, and reproduction.
8. **Poisonous Plants.** (2) II. Mr. Robbins
Lecture, Tu Th, 8-12.
Identification, distribution, toxic principles, nature of injury and animals affected, and plant control measures.
105. **Plant Anatomy.** (4) I. Miss Esau
Lectures, Tu Th, 10; laboratory, Tu Th, 1-4.
Prerequisite: Botany 1.
Structure and growth of meristems; development and structure of cells, tissues, and tissue systems; comparative anatomy of stem, root, leaf, and flowers.
106. **Morphology of Flowering Plants.** (3) II. Miss Esau
Lectures, W, 11; laboratory, Tu Th, 1-4.
Prerequisite: Botany 1.
Development and structure of flowers, fruits, seeds, and organs of vegetative reproduction of angiosperms.
107. **Weed Control.** (4) II. Mr. Crafts, Mr. Robbins
Lectures, Tu Th, 10; laboratory, W, 1-4, S, 9-12.

108. **Systematic Botany of Seed Plants.** (3) II. Mr. Tucker
Lecture, M, 11; laboratory, M F, 1-4.
Prerequisite: Botany 1.
Laboratory and field studies of the characters and relationships of the principal families and genera of seed plants. Principles of taxonomy. Practice in identification of species by means of keys.
- 120A-120B. **Plant Physiology.** (2-2) Yr. Mr. Currier
Lectures, Tu Th, 8.
Botany 121A-121B must be taken concurrently.
The cell as a physicochemical system, buffer systems, absorption and accumulation of solutes, and water relations. Photosynthesis, metabolism and storage, enzyme action, respiration, and growth.
- 121A-121B. **Plant Physiology Laboratory.** (2-2) Yr.
Laboratory, Tu Th, 1-4. Mr. Crafts, Mr. Currier
Prerequisite: Botany 1, Chemistry 8.
To be taken concurrently with 120A-120B.
130. **Plant Cytology.** (4) I. Mr. Weier
Lectures, Tu Th, 11; laboratory, M F, 1-4.
Prerequisite: Genetics 100.
The structure and function of the cytoplasm and cytoplasmic bodies; detailed studies of the nucleus, mitosis, and meiosis; chromosome structure and chemistry; chromosome observations.
131. **Chromosome Techniques.** (2) II. Mr. Weier
Laboratory, W F, 1-4.
Prerequisite: Botany 130 or equivalent.
A technique course devoted to methods used in the preparation of chromosomes for detailed study. Laboratory work to consist of preparation of temporary and permanent chromosome smears by various methods, preparation of illustrations for publications, including photomicrographs.
155. **Microscopic Technique.** (2) I. Miss Esau
Laboratory, W, 1-4, and three hours to be arranged.
Prerequisite: Botany 105 or equivalent, and permission of the instructor.
Practical introduction to methods of preparing plant tissues and materials for microscopic study, with discussion and assigned reading.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Robbins in charge)

GRADUATE COURSES

- 200A-200B. **Research in Botany.** (1-6; 1-6) Yr.
The Staff (Mr. Robbins in charge)
203. **Seminar in Plant Physiology.** (1) I and II.
Mr. Crafts, Mr. Currier, Mr. Stocking
Survey and discussion of recent developments in the field of plant physiology, on the graduate level.
208. **Seminar in Cytology.** (1) II. Mr. Weier
A seminar on the structure and chemistry of chromosomes in relation to heredity and evolution.

BUSINESS ADMINISTRATION

1A. Principles of Accounting. (3) I.

Mr. Foytik

Lecture, Tu Th, 10; laboratory, W, 1-4.

Prerequisite: at least sophomore standing.

CHEMISTRY

1A. General Chemistry. (5) I and II.

Mr. Young, Mr. Andrews, Mr. Brinton, Mr. Keefer, Mr. R.

E. Kepner, Mr. Painter, Mr. Reiber, Mr. Volman

I. (Keefer). Lectures, M W F, 9. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 9-12; Sec. 3, Tu Th, 1-4; Sec. 4, W, 1-4, S, 9-12.

II. (Brinton). Lectures, M W F, 11. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 9-12; Sec. 3, Tu Th, 1-4; Sec. 4, W, 1-4, S, 9-12.

Prerequisite: any two of the three subjects—high school chemistry, physics, trigonometry, or high school chemistry or physics alone with a grade of A or B.

Combination group students may be admitted occasionally to Chemistry 1A by permission of the instructor.

1B. General Chemistry. (5) I and II.

Mr. Young, Mr. Andrews, Mr. Brinton, Mr. Keefer, Mr. R.

E. Kepner, Mr. Painter, Mr. Reiber, Mr. Volman

I. (Young). Lectures, M W F, 11. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 9-12; Sec. 3, Tu Th, 1-4; Sec. 4, W, 1-4, S, 9-12.

II. (Reiber). Lectures, M W F, 9. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 9-12; Sec. 3, Tu Th, 1-4; Sec. 4, W, 1-4, S, 9-12.

Prerequisite: Chemistry 1A.

5. Quantitative Analysis. (3) II.

Mr. Keefer

Lecture, M, 1; laboratory, M, 2-5, F, 1-4.

Prerequisite: Chemistry 1B with a grade of C or higher.

A short course dealing with the principles and methods of quantitative analysis with some application to the analysis of agriculture materials.

8. Short Survey of Organic Chemistry. (3) I and II.

Mr. Reiber

Lectures, M W F, 10.

Prerequisite: Chemistry 1A or 1B with a grade of C or higher.

An introductory study of the compounds of carbon.

9. Methods of Organic Chemistry. (3) I.

Mr. R. E. Kepner

Lecture, M, 1; laboratory, M, 2-5, F, 1-4.

Prerequisite: Chemistry 1B with a grade of C or higher and Chemistry 8, which should be taken concurrently.

An experimental study of the physical properties and chemical reactions of the common classes of organic substances.

12A-12B. General Organic Chemistry. (5-5) Yr.

Mr. Andrews

Lectures, M W F, 9; laboratory, M F, 1-4.

Prerequisite: Chemistry 1B with a grade of C or higher.

Lectures and laboratory work designed primarily for students whose major is chemistry. The course is open to qualified students in other majors who wish a broader coverage of organic chemistry than is presented in Chemistry 8 and 9.

101. **General Biochemistry.** (3) II. Mr. Painter
Lectures, M W F, 8.
Prerequisite: Chemistry 8 or 12A.
The chemistry of carbohydrates, fats, proteins, amino acids, nucleic acids, and related compounds in plant and animal tissues. The role of these compounds in life processes.
102. **Biochemistry Laboratory.** (2) II. Mr. Painter
Laboratory, M F, 1-4.
Prerequisite: Chemistry 5 or 12B, and 101, which may be taken concurrently.
109. **Physical Chemistry, Brief Course.** (3) II. Mr. Young
Lectures, M W F, 10.
Prerequisite: Chemistry 5; one year of college physics.
Graduate students of high standing may, under exceptional circumstances, be admitted without the prerequisite courses in chemistry.
Selected topics in physical chemistry.
- *111. **Physical Chemistry.** (3) I. Mr. Keefer
Laboratory, M W F, 1-4.
Prerequisite: differential and integral calculus and Chemistry 109 or Chemistry 110A.
Physicochemical measurements and problems for students in agriculture who require this training for graduate work. To be given in alternate years.
- *113. **Chemistry of Colloids.** (3) I. Mr. Volman
Lectures, M W F, 9.
Prerequisite: Chemistry 109 or consent of the instructor.
Physical chemistry of biological systems with special emphasis on colloidal aspects.
- 114H. **Physical Chemistry—Thermodynamics.** (3) I. Mr. Young
Lectures, M W F, 11.
Prerequisite: Chemistry 5, 110A-110B; Physics 4C or equivalent; familiarity with differential and integral calculus. Restricted to honor students.
The principles of thermodynamics, with examples of their application to chemistry.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Young in charge)
Prerequisite: consent of the instructor based upon adequate preparation in chemistry, mathematics, and physics.
Investigation of special problems to be selected according to the preparation and needs of the individual.

GRADUATE COURSE

280. **Research.** (2-9) I and II. The Staff (Mr. Young in charge)
The laboratory is open to qualified graduate students who wish to pursue original investigation. Students desiring to enroll in this course should communicate with the chairman of the division well in advance of the opening of the semester in which the work is to be undertaken. Such work will be under the direction of some member of the instructing staff, who will determine the credit value.

* Not to be given, 1949-1950.

DAIRY INDUSTRY

- 1. Principles of Dairying. (3) I.** Mr. Jack, Mr. Ralston
Lectures, M W F, 11.
Lectures and demonstrations in principles of dairying, breeds of dairy cattle, elements of milk production, selection and management of dairy cattle, composition of milk and milk products, principles of manufacture of dairy products, and food value of milk products.
- 2. Laboratory in Principles of Dairying. (1) I.** Mr. Tarassuk
Laboratory, W, 1-4.
Prerequisite: Dairy Industry 1, which may be taken concurrently.
A laboratory course to accompany Dairy Industry 1; primarily for dairy industry majors. Identification and properties of the constituents of milk, laboratory tests of milk and milk products; study of dairy processing.
- 49. Summer Practice and Observation Course. (6)**
The Staff (Mr. Hubbell in charge)
Daily, except Sunday, 8-5, six weeks. Required of all students whose major is dairy industry.
Prerequisite: Dairy Industry 1.
Dairy manufacturing, market milk, dairy production, dairy plant management, and a survey of dairy plants and laboratories.
- 101A-101B. Dairy Products. (5-5) Yr.**
I. Mr. Roadhouse, Mr. Dunkley; II. Mr. Phillips, Mr. Jack
Lectures, M W F, 8; laboratory, Tu Th, 1-4.
Prerequisite: Dairy Industry 1, 2.
Market milk, butter, cheese, and ice cream industries; processing and standardization of dairy products, dairy inspection, and laboratory control of products.
- 106. Chemistry of Milk and Dairy Products. (4) II.** Mr. Tarassuk
Lectures, W S, 8; laboratory, W, 1-4, S, 9-12.
Prerequisite: Chemistry 1A-1B, 8.
The physical, physicochemical, and chemical properties of milk and milk products, and their relation to the manufacture and quality of dairy products.
- 107. Chemical Laboratory Control for Dairy Plants. (3) I.**
Lecture, W, 11; laboratory, M F, 1-4. Mr. Tarassuk, Mr. Erway
Prerequisite: Dairy Industry 1 and 2, Chemistry 5.
Evaluation of detergents and chemical sterilizers; water conditioning; detection of adulteration; principles of manufacture and tests for quality of milk powder, casein, and by-products.
- 142. Dairy Bacteriology. (3) I.** Mr. Johansson
Lecture, M, 10; laboratory, Tu Th, 9-12.
Prerequisite: Chemistry 1A-1B, Bacteriology 1.
The bacteria found in milk and other dairy products; their ways of entry; methods used in determining their number; effect of pasteurization and other processes on bacteria.

College of Agriculture

149

- 160A-160B. **Proseminar.** (1-1) Yr. The Staff (Mr. Jack in charge)
M, 11.
160A. Proseminar in determining the quality of dairy products and identifying defects.
160B. Proseminar in assigned and selected topics.
Required of all dairy industry majors in their senior year.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Jack in charge)

GRADUATE COURSES

- 200A-200B. **Research in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology.** (1-6; 1-6) Yr. The Staff (Mr. Jack in charge)
- 201A-201B. **Seminar in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology.** (1-1) Yr. The Staff (Mr. Jack in charge)
Required of all students enrolled in Dairy Industry 200A-200B.

DECORATIVE ART

- 16A. **Theory of Design and Color.** (2) I and II. Mrs. Heineman
I. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4; Sec. 3, W, 1-4, S, 9-12.
II. Laboratory, M F, 1-4.
Principles of design and color; original problems in the general field of design.
- 16B. **Theory of Design and Color.** (2) I and II. Mrs. Heineman
I. Laboratory, Tu Th, 1-4.
II. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4.
Prerequisite: Decorative Art 16A.
Original designs as applied to textiles through the mediums of block print, stencil, and silk screen process.
- 130A. **Interior Design.** (2) I. Mrs. Heineman
Lectures, Tu Th, 11.
Study of design, selection, and arrangement of furnishings. Lectures, demonstrations, field trips.

ECONOMICS

- 1A. **Principles of Economics.** (3) I and II. I. Mr. Hedges; II. Mr. Black
Lectures, Tu Th, 11; discussion section to be arranged.
Introduction to economic theory and an analysis of the operation and problems of the modern economic system.
- 1B. **Principles of Economics.** (3) II. Mr. Brekke
Lectures, Tu Th, 11; discussion section to be arranged.
Prerequisite: Economics 1A.
199. **Special Study for Advanced Undergraduates.** (1-3) I and II.
Mr. Mehren

EDUCATION

110. **Introduction to Educational Psychology.** (3) II. Mr. Bursch
Lectures, M W F, 11.
Original nature and tendencies of man; the learning process; individual differences and their measurement; the growth and development of children.
160. **Vocational Education.** (2) I and II. Mr. Sutherland
Philosophy and organization of vocational education of less than college grade, with particular reference to educational principles for agriculture, commerce, homemaking, and industry.
- †161. **Problems in Vocational Education.** (2) I and II. Mr. Sutherland
Prerequisite: Education 160 or 162 (Berkeley).
Vocational surveys, junior employments, occupational analysis, trade tests, apprentice training, vocational education for adults, foremanship courses, corporation schools, current legislation, etc.
170. **Secondary Education.** (2) II. Mr. Bursch
Lectures, Tu Th, 10.
Function, scope, objectives, and curricula, including the fields of the high school and junior college in relation to individual and social needs.
198. **Directed Group Study of Agricultural Education.** (2) II.
Lectures, M W, 9. The Staff (Mr. Sutherland in charge)
Group study of selected problems dealing with subject matter relating to the teaching of technical agriculture.
199. **Special Study for Advanced Undergraduates in Agricultural Education.** (1-5) I and II. The Staff (Mr. Sutherland in charge)

GRADUATE COURSE

- 260A-260B. **Vocational Education Seminar.** (2-2) Yr.
Mr. Griffin, Mr. Sutherland
For graduate students whose major interest is in vocational education, vocational guidance, or closely related problems.

SUPERVISED TEACHING COURSES

- †320A. **Introduction to Teaching.** (1) I and II. Mr. Juergenson
A limited number of juniors and seniors will be admitted.
Lectures, conferences, and field work. Observations and participation in some form of public school work.
- †320B. **Audio-Visual, Radio, and Other Instructional Resources.** (2) I and II.
Mr. Juergenson, Mr. Sutherland
Lectures, conferences, demonstrations, and school experience. Introduction to the materials and methods of audio-visual-radio education. Preparation of teaching materials; collecting, organizing, processing, and evaluating audio-visual materials.

† Open only to apprentice teachers and graduate students.

†320C. **Supervised Teaching.** (3) I and II. Mr. Sutherland, Mr. Juergenson
Prerequisite: Education 320A.

Directed teaching in agriculture and homemaking for candidates for the special secondary credentials in these fields. Candidates who are graduates of institutions other than the University of California must submit two copies of transcripts of records at the time of applying for supervised training.

†320E. **Methods of Teaching.** (2) I and II.

Lectures, conferences, and laboratory.

All students enrolled in 320E must enroll in 320C concurrently.

Sec. 1. Agriculture.

Mr. Sutherland, Mr. Juergenson

The principles and methods of teaching agriculture in the secondary schools of California in accordance with the provisions of the Federal and State Vocational Education Acts.

Sec. 11. Homemaking.

Planning for teaching; basis for selection and organization of materials, their use and evaluation; teaching methods and classroom aids. Practices in class and department management. Relation of department programs to school and community.

†323. **Practicum in Supervised Teaching.** (2) I and II.

Mr. Sutherland, Mr. Juergenson

Prerequisite: Education 320 or experience as a teacher, and consent of the instructor.

An opportunity to obtain more extended and varied experience under supervision. The candidate teaches ten weeks and attends one professional methods section offered under course 320, as well as such demonstration and discussion groups as may be assigned. One hundred hours of work, including preparation, is the normal requirement. Hours are divided among various types of work according to the candidate's previous experience.

ENGINEERING

(See Agricultural Engineering, page 138, and Irrigation, page 160)

ENGLISH

Student must have passed Subject A before taking any course in English.

1A. **Reading, Composition, and Speech.** (3) I and II.

Mrs. Wright, Mr. Fishman, Mr. Guyer, Mrs. Homann,
Mrs. Needham, Miss Van Norden

Lectures: Sec. 1, M W F, 8; Sec. 2, M W F, 9; Sec. 3, M W F, 10; Sec. 4, M W F, 11.

Principles of effective reading, writing, and speaking.

1B. **Reading, Composition, and Speech.** (3) I and II.

Mrs. Wright, Mr. Fishman, Mr. Guyer, Mrs. Homann,
Mrs. Needham, Miss Van Norden

I. Lectures: Sec. 1, M W F, 9; Sec. 2, M W F, 11.

II. Lectures: Sec. 1, M W F, 9; Sec. 2, M W F, 10; Sec. 3, M W F, 11.

Prerequisite: English 1A.

Continuation of English 1A. For maximum benefit, the student is advised to complete both courses.

† Open only to apprentice teachers and graduate students.

- 44A-44B. **Masterpieces of Literature.** (3-3) Yr. Mr. Guyer, Mrs. Homann
Lectures, M W F, 11.
Prerequisite: English 1A and sophomore standing. English 44A is not prerequisite to 44B.
Lectures on great works of the world's literature. Designed for the general reader.
- 46A-46B. **Survey of English Literature.** (3-3) Yr.
Lectures, M W F, 9. Mr. Fishman, Mrs. Homann
Prerequisite: English 1A and sophomore standing. English 46A is not prerequisite to 46B.
The more important aspects of the history of English literature from the beginnings to 1900. Designed for the general reader.
- 106L. **Advanced Composition.** (3) I. Mrs. Wright
Lectures, M W F, 10.
Prerequisite: English 1A and junior standing.
Designed to develop a clear, accurate, interesting style. Agricultural students are encouraged to submit technical papers. Other students are welcome to try other forms of composition.
- 117A. **Shakespeare.** (3) I. Miss Van Norden
Lectures, M W F, 8.
Prerequisite: English 1A and junior standing.
Designed for the general reader.
- 125C-125D. **The Novel.** (3-3) Yr. Mrs. Needham
Lectures, M W F, 11.
Prerequisite: English 1A and junior standing. English 125C is not prerequisite to 125D.
Designed for the general reader.
- 130C. **American Literature: 1885 to the Present.** (3) II. Mrs. Wright
Lectures, M W F, 10.
Prerequisite: English 1A and junior standing.
Designed for the general reader.

ENTOMOLOGY AND PARASITOLOGY

1. **General Entomology.** (4) II. Mr. Bohart
Lectures, Tu Th, 8; laboratory, Tu Th, 1-4.
The classification, life history, structure, and physiology of insects.
105. **Apiculture.** (4) II. Mr. Eckert
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
Biology and handling of bees.
107. **Queen Bee Rearing.** (4) II. Mr. Laidlaw, Jr.
Lectures, Tu Th, 10; laboratory, W, 1-4, S, 9-12.
Prerequisite: Entomology 105 or advanced training in apiculture and consent of instructor.
History, critical role played by queen bees in beekeeping practice; morphology of reproductive system; formation of germ cells; embryology and postembryological development; practice in modern queen-rearing methods; selection and testing of stock; artificial insemination of queen bees.

116. **Veterinary Parasitology.** (3) I. Mr. Douglas
Lectures, Tu Th, 9; laboratory, W, 1-4.
Prerequisite: Zoölogy 1A-1B.
(This course or Veterinary Science 111 meets the requirement of 3 units of parasitology in the animal science curriculum.)
Parasites of domesticated animals.
124. **Economic Entomology.** (4) I. Mr. Bailey, Mr. L. M. Smith
Lectures, Tu Th, 11. Laboratory: Sec. 1, Tu Th, 1-4; Sec. 2, Tu Th, 8-11.
Life histories, habits, and control of insects attacking fruit trees and field and truck crops of California.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Bailey, Mr. Bohart, Mr. Douglas, Mr. Eckert,
Mr. Laidlaw, Jr., Mr. Lange, Mr. L. M. Smith

GRADUATE COURSE

- 201A-201B. **Research in Entomology and Parasitology.** (1-6; 1-6) Yr.
The Staff (Mr. Bailey in charge)

FRENCH

1. **Elementary French—Beginning.** (4) I and II. Mr. Nelson, Mr. Puknat
I. Lectures, M Tu W F, 10.
II. Lectures, M Tu W F, 9.
This course corresponds to the first two years of high school French.
2. **Elementary French—Continued.** (4) II. Mr. Nelson, Mr. Puknat
Lectures, M Tu W F, 10.
Prerequisite: French I or two years of high school French.

GENETICS

100. **Principles of Genetics.** (4) I. Mr. Gregory
Lectures, M W F, 9. Laboratory: Sec. 1, W, 1-4; Sec. 2, Th, 8-11; Sec. 3, Th, 1-4; Sec. 4, F, 1-4.
Prerequisite: Botany 1, Zoölogy 1A-1B; or Botany 1 and Zoölogy 10.
Introduction to genetics with some consideration of its applications in agriculture and biology.

GRADUATE COURSES

- 200A-200B. **Research in Genetics.** (1-6; 1-6) Yr.
Mr. Clausen, Mr. Asmundson, Mr. Briggs, Mr. Gregory,
Mr. Love, Mr. Olmo, Mr. Rick
- 201A-201B. **Staff Seminar in Genetics.** (No credit) Yr.
M, 4-6. The Staff (Mr. Briggs in charge)
Weekly meetings for presentation of special topics by members of the staff, visiting investigators, and graduate students.

GEOLOGY

1. **General Geology—Dynamical and Structural.** (3) II. _____
Lectures, M W, 11. Laboratory: Sec. 1, M, 1-3; Sec. 2, Tu, 1-3; Sec. 3, W, 1-3.
Prerequisite: one year of elementary chemistry.
Minerals and rocks; weathering and erosion of rocks; study of sub-surface water, volcanoes, earthquakes, and mountain-building movements.

GERMAN

1. **Elementary German—Beginning.** (4) I and II. Mr. Puknat
 I. Lectures, M Tu W F, 11.
 II. Lectures, M W F, 8; Tu, 1.
 This course corresponds to the first two years of high school German.
2. **Elementary German—Continued.** (4) II. Mr. Puknat
 Lectures, M Tu W F, 11.
 Prerequisite: German 1 or two years of high school German.
3. **Intermediate German.** (4) I. Mr. Puknat
 Lectures, M Tu W F, 8.
 Prerequisite: German 2 or three years of high school German.

HISTORY

- 4A-4B. **History of Europe.** (3-3) Yr. Mr. O'Brien
 Lectures, Tu Th, 8; discussion section arranged by the instructor.
 The growth of Western European civilization in its world setting from ancient times to the present.
 History 4A is not prerequisite to 4B.
- 8A-8B. **History of the Americas.** (3-3) Yr. Mr. Morrissey
 Lectures, M W, 8; discussion section arranged by the instructor.
 History 8A is not prerequisite to 8B.
 8A. Introductory course in colonial history of the Western Hemisphere.
 8B. The national period of Latin-American history.
- 17A-17B. **History of the United States.** (3-3) Yr. Mr. Puryear
 Lectures, Tu Th, 10; discussion section arranged by the instructor.
 History 17A is not prerequisite to 17B.
 Open to all students above the freshman year.
 Completion of both parts satisfies the American History and Institutions requirement.
- 136A-136B. **History of Russia and Poland Since the Crimean War.** (3-3) Yr.
 Lectures, M W F, 9. Mr. O'Brien
 History 136A is not prerequisite to 136B.
 136A. Russia and Poland with emphasis on Soviet Russia.
 136B. Russia and the Soviet Union in world politics and world economics.
148. **Recent World History.** (3) II. Mr. Puryear
 Lectures, M W F, 10.
 The historical development of Europe and the world since the first World War, and the current situation in world politics and world economics.
- 171A-171B. **History of the United States.** (3-3) Yr. Mr. Puryear
 Lectures, Tu Th, 10; discussion section arranged by the instructor.
 NOTE.—Upper division students (those having completed 62 units of University work) may obtain upper division and major credit for History 17A-17B (see above), by entering it on their study lists as 171A-171B.
 Completion of both parts satisfies the American History and Institutions requirement.

- 174B. **Recent History of the United States.** (3) I. Mr. Shideler
Lectures, M W F, 11.
Covers the period 1917 to 1948. The course satisfies half of the American History and Institutions requirement.
185. **Government and Agriculture of the United States.** (3) II. ———
Lectures, M W F, 4.
Major problems of the relations between government and agriculture, including their special significance for California; public land policies; transportation; agricultural education; the agrarian reform movements; tariffs; marketing; credit; surpluses; conservation.
- 188A-188B. **History of Agriculture in the Americas.** (2-2) Yr. Mr. Shideler
Lectures, Tu Th, 8.
History 188A is not prerequisite to 188B.
A general survey of the history of agriculture in North and South America from pre-Columbian times to the present.
- 189A-189B. **History of California and the Pacific Coast.** (3-3) Yr.
Lectures, M W F, 10. Mr. Morrissey
History 189A is not prerequisite to 189B.
189A. History of the Pacific Coast, Spanish and early American period.
189B. History of California, 1840 to the present.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Puryear in charge)

HOME ECONOMICS

(See also Decorative Art, page 149)

- 1A-1B. **Experimental Food Study.** (3-3) Yr. Mrs. Jentsch
Lecture, T, 1; laboratory, Tu Th, 1-4.
Prerequisite or taken concurrently: Chemistry 1A and 8. Recommended: Bacteriology 1.
Production and composition of food and principles involved in food preservation and meal preparation.
6. **Introduction to Textiles.** (3) II. Miss Dryden
(Formerly numbered 7.)
Lectures, Tu Th, 9; laboratory, W, 1-4.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.
Field trips are included.
7. **Elementary Clothing Study.** (3) I. Miss Dryden
(Formerly numbered 5.)
Lecture, W, 10; laboratory, M F, 1-4.
Prerequisite: Decorative Art 16A-16B.
Practical and cultural problems in modern garment design and construction problems in clothing.

- *10. **Elementary Nutrition.** (2) II. Mrs. Jentsch
Lectures, Tu Th, 8.
A nontechnical presentation of the scientific and practical bases and uses of the modern knowledge of nutrition.
Not accepted as part of the general major in home economics.
14. **Consumer Problems.** (2) II. Miss Warren
Lectures, Tu Th, 10.
A nontechnical discussion of consumers' problems, including management of personal finances and efficient purchasing of consumers' goods.
Not accepted as part of the general major in home economics.

FOOD ECONOMICS AND TECHNOLOGY

- *100. **Food Economics.** (3) II. Mrs. Jentsch
Lectures, Tu Th, 11. One laboratory period or field trip.
Prerequisite or concurrent: Home Economics 1A-1B and 141.
Field observation of manufacturing and distribution practices related to problems of consumers including those buying foods in large quantities.
Laboratory study of qualities of food in relation to use and price.

NUTRITION AND DIETETICS

- 112A-112B. **Food and Dietetics.** (3-3) Yr. Mrs. Jentsch
(Formerly numbered 102A-102B.)
112A. Lectures, Tu Th, 9; laboratory, M, 1-4.
112B. Lectures, Tu Th, 10; laboratory, F, 1-4.
Prerequisite: Chemistry 1A and 8, Physiology 1A, and Home Economics 1A-1B.
The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease. The planning and computation of diets.

CHILD DEVELOPMENT

132. **Child Psychology.** (3) I. _____
Lectures, M W F, 8.
Prerequisite: Psychology 1A and preparation in statistics. Not open to students who have taken Psychology 112.
A study of the factors concerned in the motor, sensory, language, mental, emotional, and social development of young children.
133. **Laboratory in Child Development.** (1) I. _____
To be arranged.
Prerequisite or concurrent: Home Economics 132 or Psychology 112.
Laboratory supplement to Home Economics 132 conducted at the nursery school.
134. **Child Care.** (3) II. _____
Lectures, M W F, 9.
Prerequisite: Physiology 1.
A consideration of the physical development of children from prenatal through adolescent life, and the factors affecting health during this period. Field trips are included.

* Not to be given, 1949-1950.

FAMILY ECONOMICS

140. **Home Management.** (3) II. Miss Warren
Lectures, M F, 10; laboratory, M, 1-4.
Prerequisite: Physiology 2 and Psychology 1A.
Use of time, energy, and equipment in the home from the viewpoint of the satisfaction of members of the family.
- *140L. **Home Management Laboratory.** (2) II. Miss Warren
To be arranged.
Prerequisite or concurrent: Home Economics 140. Should be taken in the senior year.
Laboratory which includes living for a period of 5 weeks under supervision in the home management house. A fee is required to cover food, lodging, and laundry.
- *141. **Consumers and the Market.** (3) II. Miss Warren
Lectures, M W F, 10.
Prerequisite or concurrent: Economics 1A-1B.
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
142. **Social Problems of Families.** (3) I. Miss Warren
Lectures, M W F, 8.
Prerequisite: Economics 1A-1B, and statistics.
Present-day problems of families as they are related to economic and social conditions.
144. **Family Finance.** (3) I. Miss Warren
Lectures, M W F, 9.
Prerequisite: Economics 1A-1B and statistics.
Management of personal and family finances—money income, household production, credit, savings, investments, financing home ownership.

HOUSING AND HOUSE FURNISHING

150. **The House.** (2) II. Mrs. Heineman
Lectures, Tu Th, 11.
Dwellings—isolated and collective; their historic and aesthetic development; their elements and arrangements; their equipment. (Similar to Architecture 110 given at Berkeley.)
- *152. **Home Furnishing.** (2) II. Mrs. Heineman
(Formerly numbered 190.)
Laboratory, W, 1-4, S, 9-12.
Prerequisite: Decorative Art 16A-16B and 130A.
Arrangement of the house and furnishings in terms of color and design.
Lectures, demonstrations, and field trips.

CLOTHING AND TEXTILES

162. **Clothing Economics.** (3) I. Miss Dryden
Lectures, M F, 10; laboratory, W, 1-4.
Prerequisite or concurrent: Home Economics 6 and 141.
The problems involved in the selection, purchase, and care of household

* Not to be given, 1949-1950.

textiles and clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries. Field trips are included.

175. **Clothing Design and Construction.** (3) II. Miss Dryden
(Formerly numbered 167.)
Lecture, W, 10; laboratory, Tu, Th, 1-4.
Prerequisite: Home Economics 6 and 7.
Wardrobe planning and problems in advanced clothing construction.

SPECIAL STUDIES

199. **Special Study for Advanced Undergraduates.** (1-5) Yr.
The Staff (Miss Warren in charge)

HORTICULTURE

(For courses in vegetable production, see Truck Crops, page 171)

2. **Fruit Growing.** (3) I. Mr. L. D. Davis
Lectures, M W F, 8.
Prerequisite: Botany 1 or 12.
Fruit growing practices; propagating, planting, and culture of orchard and small fruits.
- *10. **Plant Propagation.** (2) II. Mr. R. E. Baker
Lectures, Tu Th, 10.
Principles of propagation, with special reference to horticultural plants.
- 105P. **Pomology: Fruit Handling and Varieties.** (3) Mr. R. M. Brooks
Four lectures; 4 laboratory periods.
Prerequisite: Horticulture 2.
A six weeks' summer course beginning August 1, 1949. May be taken concurrently with 105V.
Fruit handling practices and problems emphasizing the characteristic differences of certain species and varieties of fruit. Field trips are included.
- 105V. **Viticulture: Fruit Handling and Varieties.** (3) Mr. Winkler
Four lectures; 4 laboratory periods.
Prerequisite: Horticulture 116.
A six weeks' summer course beginning August 1, 1949. May be taken concurrently with 105P.
Maturity and standardization; varieties; harvesting table grapes; raisin drying; storage; costs and returns.
- 106A-106B. **Fruit Plants.** (2-2) Yr. Mr. Crane
Lecture, M, 10; laboratory, M, 1-4.
Prerequisite: Horticulture 2. 106A is not prerequisite to 106B.
Fruit growing practices, emphasizing the characteristic differences of certain species of fruit plants.
110. **Fruit Morphology.** (3) I. Mr. R. M. Brooks
Lecture, W, 10; laboratory, W, 1-4 and 3 hours to be arranged.
Prerequisite: Botany 1.
The morphological development of the flower, fruit, and seed of more than thirty typical horticultural species.

* Not to be given, 1949-1950.

112. **Handling and Storage of Deciduous Fruits and Grapes.** (2) I. Mr. Allen
Lectures, Tu Th, 9.
Prerequisite: Horticulture 2 and Botany 7, or equivalent of each.
Fundamentals of certain fruit-handling operations; fruit maturity; pre-cooling; fruit storage and transportation. Particular emphasis is given to the physiological principles underlying these postharvest practices.
114. **Fruit Breeding.** (3) II. Mr. Olmo
Lectures, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Horticulture 2, Genetics 100.
The genetics and cytology of fruit species in relation to varietal improvement, including a study of sterility, incompatibility, interspecific hybridization, and clonal selection in fruit varieties.
116. **General Viticulture.** (4) II. Mr. Winkler
Lectures, M W F, 8. Laboratory: Sec. 1, M, 1-4; Sec. 2, W, 1-4.
Prerequisite: Horticulture 2.
The structure, physiology, and climatic requirements of the vine; principles underlying propagation, pruning, grafting, cultivation; and factors influencing fruit development and quality.
- 120A-120B. **Enology.** (3-3) Yr. Mr. Amerine
120A. Lecture, F, 1; laboratory, M, 1-4, F, 2-5.
120B. Lectures, W, 10, F, 1; laboratory, F, 2-5.
Prerequisite: Bacteriology 1, Chemistry 5 and 8, and Viticulture 105V for 120A; it is recommended that 120B precede 120A. Horticulture 120A is not prerequisite to 120B.
120A. The principles and practices of making the various standard types of wine with special reference to the varieties used, and the methods of vinification required by each.
120B. Chemical analyses of wines; laboratory control measures for wines; wine types; production of special wines.
121. **Advanced Horticulture.** (3) I. Mr. Proebsting
Lectures, M W F, 8.
Prerequisite: Horticulture 2; either 105P and 106A-106B, or 116 and 105V; Botany 7.
The physiology of fruit trees, their response to environment and to cultural operations.
- 130A-130B. **Microbiology of Wine Production.** (3-2) Yr. Mr. Castor
130A. Lecture, Tu, 10; laboratory, Tu Th, 1-4.
130B. Lecture, Tu, 10; laboratory, Tu, 1-4.
Prerequisite: Bacteriology 1, Chemistry 5 and 8.
130A. Nature, development, classification, physiology, biochemistry, and utilization of yeasts involved in wine making.
130B. Nature, development, and physiology of the yeasts and bacteria involved in the aging and spoilage of wines.
NOTE.—Given beginning in the odd-numbered years.
- *140. **Unit Operations in Winery Practice.** (2) I. Mr. Guymon
Lecture, Tu, 10; laboratory, Tu, 1-4.
Prerequisite: Chemistry 1B; 5 and 8 recommended.
Principles and practice of distillation, evaporation, filtration, and other winery operations.
NOTE.—Given in the even-numbered years.

* Not to be given, 1949-1950.

- *141. **Brandy.** (2) II. Mr. Guymon
 Lecture, Tu, 10; laboratory, Tu, 1-4.
 Prerequisite: Chemistry 5 and 8.
 Composition and types of brandy, analytical methods, and factors affecting changes during aging and storage.
 NOTE.—Given in the odd-numbered years.
199. **Special Study for Advanced Undergraduates in Pomology.** (1-5)
 I and II. The Staff (Pomology, Mr. Tufts in charge; Viticulture,
 Mr. Winkler in charge)

GRADUATE COURSES

- 201A-201B. **Research in Pomology.** (1-6; 1-6) Yr.
The Staff (Mr. Tufts in charge)
- 205A-205B. **Seminar.** (1-1) Yr. Mr. L. D. Davis
 Tu, 4.
- 233A-233B. **Research in Viticulture and Enology.** (1-6; 1-6) Yr.
The Staff (Mr. Winkler in charge)

IRRIGATION

100. **Principles Underlying Irrigation in Its Soil and Plant Relationships.**
 (3) II. Mr. Veihmeyer, Mr. Hagan
 Lectures, Tu Th, 11; laboratory, W, 1-4.
 Prerequisite: Botany 7, Physics 2A-2B, Chemistry 1A-1B.
 A general course covering movement of irrigation water in the soil, the relation of soil moisture to plant growth, and the availability of soil moisture to plants.
110. **Development and Use of Farm Irrigation Water Supplies and Systems.**
 (4) I. Mr. Johnston
 Lectures, M W F, 8; laboratory, F, 1-4.
 Prerequisite: Physics 2A-2B.
 Irrigation as a factor in agriculture; principles of irrigation practice; development of the farm irrigation water supply; preparation of land for irrigation; design of farm irrigation systems; water requirements of crops.
120. **Irrigation Hydraulics.** (3) I. Mr. Johnston
 Lectures, Tu Th, 8; laboratory, W, 1-4.
 Prerequisite: Engineering 1A and 110. (Irrigation 103 at Berkeley may be substituted for 110.)
 The principles of hydraulics as applied to design of water-measuring devices, ditches, flumes, pipe lines, drops, diversion structures, reservoirs, pumping machinery, sprinkling systems, and other irrigation equipment. The instruction is arranged to suit the training and needs of the individual student.
130. **Underground Water and Farm Irrigation Pumping Plants.** (3) II.
 Lectures, M W F, 8. Mr. Scott
 Prerequisite: Chemistry 1A-1B, Physics 2A-2B.
 Origin and disposition of ground water, methods of estimating the sufficiency of ground water supplies; hydraulics of wells; construction of wells; installation and operation of irrigation pumping systems.

* Not to be given, 1949-1950.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Veihmeyer in charge)

GRADUATE COURSE

- 201A-201B. **Research in Irrigation.** (1-6; 1-6) Yr.
The Staff (Mr. Veihmeyer in charge)

ENGINEERING

- 1A. **Plane Surveying.** (3) II. Mr. Scott
Lectures, Tu Th, 8; laboratory, Th, 1-4.
Prerequisite: plane trigonometry.
Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.

LANDSCAPE DESIGN

3. **Planning the Home Grounds.** (2) I and II. _____
Lecture, W, 10; laboratory, W, 1-4.
Not open to major students in the landscape design curriculum.
A general study of the principles and methods governing the design of small properties, and the use of plant materials.

MATHEMATICS

- C. **Trigonometry.** (3) I and II. The Staff (Mr. Burdette in charge)
I. Lectures: Sec. 1, M W F, 9; Sec. 2, M W F, 10.
II. Lectures: Sec. 1, M W F, 8; Sec. 2, M W F, 9.
Prerequisite: plane geometry; one and one-half years of high school algebra or Mathematics D.
Includes plane trigonometry and spherical right triangles.
- D. **Intermediate Algebra.** (3) I and II. The Staff (Mr. Hayes in charge)
I. Lectures: Sec. 1, M Tu W Th F, 8; Sec. 2, M Tu W Th F, 9.
II. Lectures, M Tu W Th F, 8.
Prerequisite: one year or one and one-half years of high school algebra.
Not open for credit to students who have received credit for two years of high school algebra, or Mathematics 1 or 3A.
1. **College Algebra.** (3) I and II. Mrs. Rolfe, Mr. Hayes, Mr. Steck
Lectures, M W F, 10.
Review and practice in general ideas and applications of algebra and trigonometry. Methods of proof and scientific procedure as exemplified in these subjects.
Open only to students who transfer to the course from 3A.
- 3A. **Analytic Geometry and Calculus, First Course.** (3) I and II.
Lectures, M W F, 10. Mr. Arnold, Mr. Burdette
Prerequisite: two years of high school algebra or Mathematics D; plane geometry, plane trigonometry. Those who do not meet these prerequisites may demonstrate their fitness by passing an examination in these topics.
NOTE.—A qualifying examination in algebra will be given early in the week of registration. Students who fail this test will be required to pass Mathematics 1 before taking 3A.
Elements of differential calculus and analytic geometry.

3B. Analytic Geometry and Calculus, Second Course. (3) I and II.

Lectures, M W F, 10. Mr. Roessler, Mr. Arnold, Mr. Burdette

Prerequisite: Mathematics 3A or Mathematics 11A-11B.

Continuation of 3A. Analytic geometry, differential and integral calculus.

NOTE.—Special sections are arranged for students who have taken a semester course of analytic geometry without calculus.

4A. Analytic Geometry and Calculus, Third Course. (3) I and II.

Lectures, M W F, 8.

Mr. Alder, Mr. Roessler

Prerequisite: Mathematics 3B.

Continuation of 3B. Thorough technique of differential and integral calculus.

4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.

Lectures, M W F, 8.

Mr. Fulton, Mr. Alder

Prerequisite: Mathematics 4A.

Continuation of 4A. Geometry and analysis of functions of several variables, partial derivatives, multiple integrals.

8. Theory of Algebraic Equations. (3) II. Mr. Burdette, Mr. Hayes

Lectures, M W F, 11.

Prerequisite: two years of algebra in high school (or Mathematics D) and trigonometry.

***10. Spherical Trigonometry. (2) I.**

Lectures, Tu Th, 10.

Prerequisite: plane trigonometry; one and one-half years high school algebra, or Mathematics D and plane trigonometry.

11A-11B. Analytic Geometry and Calculus. (3-3) Yr.

Lectures, M W F, 11.

Mr. Arnold, Mr. Burdette

Prerequisite: one and one-half years of high school algebra or Mathematics D; plane geometry; plane trigonometry.

The elements of analytic geometry and of differential and integral calculus.

13. Elementary Statistics. (3) I and II.

I. Lectures, M W F, 8.

Mr. Roessler, Mrs. Rolfe, Mr. G. A. Baker

II. Lectures, M W F, 10.

Prerequisite: two years of high school algebra or Mathematics D.

Arrays of experimental measurements, measures of central tendency, variation and correlation, significance of measures; elementary reliability and validity of tests.

105. Statistical Methods for Biologists. (3) II.

Lectures, M W F, 11.

Mr. Roessler, Mr. G. A. Baker

Prerequisite: Mathematics 13 or consent of the instructor.

Recent developments in statistical analysis, methods of sampling, design of experiments, and interpretation of results.

110A-110B. Advanced Calculus. (2-2) Yr.

Mr. Burdette

Lectures, Tu Th, 9.

Prerequisite: Mathematics 4B.

Conjugate functions, hyperbolic functions, Fourier series, differential equations.

* Not to be given, 1949-1950.

130A-130B. **Statistical Inference.** (3-3) Yr.

Mr. G. A. Baker

Lectures, M W F, 9.

Prerequisite: Mathematics 3A-3B or 11A-11B.

Basic concepts and principal tools of probability theory, hypothesis testing, and estimation, presented for students of natural and social sciences and engineering. While the conceptual and applicational aspects are treated carefully, the more difficult mathematical theorems are stated without proof.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.

The Staff (Mr. Roessler in charge)

GRADUATE COURSES

290. **Seminars in Mathematics.** (2-6) I and II.

The Staff (Mr. Roessler in charge)

Topics in foundations of mathematics, analysis, geometry, algebra, probability and theory of statistics, and in their applications, by means of lectures and informal conferences with staff members.

295. **Research in Mathematics.** (2-6) I and II.

The Staff (Mr. Roessler in charge)

MECHANICAL ENGINEERING

(See Agricultural Engineering, page 138)

MILITARY SCIENCE AND TACTICS*

LOWER DIVISION COURSES

Infantry

The lower division, or elementary courses, are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States, able-bodied, and under twenty-three years of age at time of initial enrollment in the elementary course. A first-year or second-year student claiming exemption because of noncitizenship, physical disability, age, or military service will present to the Recorder a petition for such exemption on the prescribed form. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work of such courses.

1A. **Basic (First Year).** (2) I.

The Staff

(Formerly 10A and/or 50A.)

Lectures: Sec. 1, M W, 1; Sec. 2, M W, 2; Sec. 3, Tu Th, 9; Sec. 4, Tu Th,

* *Reserve Officers' Training Corps.* The course in the training of Infantry is that prescribed by the Department of the Army for corresponding units of the senior division of the Reserve Officers' Training Corps. The United States government furnishes arms, equipment, uniforms, and textbooks for the use of students belonging to such units.

The mission of the Senior Division ROTC is to produce junior officers who have the qualities and attributes essential to their progressive and continued development as officers in a component of the Army of the United States.

Students who complete the advanced course, and who participate in such summer camps as the Secretary of the Army may prescribe, are eligible upon graduation for appointment and commission by the President in the Officers' Reserve Corps. Students who complete the advanced course are also eligible to be commissioned by the Governor of the State of California in the University Cadets. These courses are open only to physically qualified students who are citizens of the United States.

11; Sec. 5, Tu Th, 1; Sec. 6, Tu Th, 2; Sec. 7, W F, 9; Sec. 8, W F, 11. Leadership, drill and exercise of command, Tu, 4-6.

Required of all physically fit male students unless specific exemption is granted.

World military situation; military organization; leadership, drill, and exercise of command; individual weapons and marksmanship; National Defense Act and ROTC.

1B. Basic (First Year). (2) II.

The Staff

(Formerly 10B and/or 50B.)

Lectures: Sec. 1, M W, 1; Sec. 2, M W, 2; Sec. 3, Tu Th, 9; Sec. 4, Tu Th, 11; Sec. 5, Tu Th, 1; Sec. 6, Tu Th, 2; Sec. 7, W F, 9; Sec. 8, W F, 11. Leadership, drill, and exercise of command, Tu, 4-6.

Prerequisite: Military Science 1A. Required of all physically fit male students unless specific exemption is granted.

World military situation; hygiene and first aid; leadership, drill, and exercise of command; maps and aerial photographs.

2A. Basic (Second Year). (2) I.

The Staff

(Formerly 11A and/or 60A.)

Lectures: Sec. 1, M W, 1; Sec. 3, Tu Th, 11; Sec. 4, Tu Th, 1; Sec. 6, W F, 11. Leadership, drill, and exercise of command, Tu, 4-6.

Prerequisite: Military Science 1A and 1B, or their equivalents.

Required of all physically fit male students unless specific exemption is granted.

World military situation; leadership, drill, and exercise of command; maps and aerial photographs; military administration; military law and boards.

2B. Basic (Second Year). (2) II.

The Staff

(Formerly 11B and/or 60B.)

Lectures: Sec. 1, M W, 1; Sec. 3, Tu Th, 11; Sec. 4, Tu Th, 1; Sec. 6, W F, 11. Leadership, drill, and exercise of command, Tu, 4-6.

Prerequisite: Military Science 2A. Required of all physically fit male students unless specific exemption is granted.

World military situation; leadership, drill, and exercise of command; physical development methods; evolution of warfare.

UPPER DIVISION COURSES

Infantry

For admission to the upper division or advanced courses, students must be under twenty-seven years of age at the time of initial enrollment; they must be selected by the professor of military science and tactics and the head of the institution; and must execute a written agreement with the Government to complete the course, including attendance at summer camp.

During the two-year period of the advanced courses, students will be paid commutation of subsistence in an amount prescribed by the Secretary of the Army.

Advanced-course students will normally attend a prescribed summer camp between their junior and senior years. During camp, students will receive subsistence and quarters in kind, and will be paid at the rate prescribed for soldiers in the grade of private.

For students enrolled in the advanced courses, satisfying the conditions of the written agreement is prerequisite to graduating from the University.

- 106A. **Advanced Infantry (First Year).** (3) I. The Staff
Lectures, M W F, 12. Leadership, drill, and exercise of command, Tu, 4-6.
For selected students who have successfully completed the elementary course or its equivalent.
Military leadership; psychology and personnel management, occupied territories; military law and boards; organization; gunnery; technique of fire and fire control; motors and transportation; troop movement.
- 106B. **Advanced Infantry (First Year).** (3) II. The Staff
Lectures, M W F, 12. Leadership, drill, and exercise of command, Tu, 4-6.
Prerequisite: Military Science 106A.
Leadership, drill, and exercise of command; occupied territories; military problems of the United States; tactics; communication; military team; gunnery; technique of fire, and fire control.
- 107A. **Advanced Infantry (Second Year).** (3) I. The Staff
Lectures, M W F, 12. Leadership, drill, and exercise of command, Tu, 4-6.
Prerequisite: Military Science 106A-106B.
Leadership, drill, and exercise of command; command and staff; psychological warfare; military mobilization and demobilization; new developments; communications; gunnery; technique of fire and fire control; supply and maintenance.
- 107B. **Advanced Infantry (Second Year).** (3) II. The Staff
Lectures, M W F, 12. Leadership, drill, and exercise of command, Tu, 4-6.
Prerequisite: Military Science 107A.
Geographical foundation of national power; combined and joint operations; military teaching methods; troop movements; tactics.

MUSIC

- 25A-25B. **University Band.** (1) I and II. Mr. McArdell
One 2-hour rehearsal.
Prerequisite: technical proficiency sufficient to meet requirements of performance.
Rehearsal and performance of band music. May be repeated once without duplication of credit.
- 27A-27B. **Introduction to Musical Literature.** (2) I and II. Mr. McArdell
Lectures, Tu Th, 8.
Music 27A is not prerequisite to 27B.
Lectures, illustrations, and readings designed to furnish a general appreciation of music.
- 35A-35B. **University Chorus.** (1) I and II. Mr. McArdell
One 2-hour rehearsal.
Rehearsal and performance of choral music. May be repeated once without duplication of credit.
- 75A-75B. **University Symphony Orchestra.** (1) I and II. Mr. McArdell
One 2-hour rehearsal.
Prerequisite: technical proficiency sufficient to meet requirements of performance.
Rehearsal and performance of symphonic music. May be repeated once without duplication of credit.

PHYSICAL EDUCATION

The incidental fee, payable by all students at the time of registration, entitles students to the use of the gymnasium, swimming pool, showers, towels, lockers, tennis courts, and the athletic fields. Equipment for games and sports are available for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit.

Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department.

1. **Physical Education for Men.** ($\frac{1}{2}$) I and II.

Mr. Toomey, Mr. Boyer, Mr. Forbes, Mr. Hickey, Mr. Schall,
Mr. Stromgren, Mr. E. S. Wilson

Sections meet twice weekly at hours to be arranged.

Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch football, track, wrestling, swimming, lifesaving, and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football and basketball, and receive credit for this elective.

This course may be repeated for credit not to exceed a total of 4 units.

26. **Physical Education for Women.** ($\frac{1}{2}$) I and II.

Miss Welch

Sections meet twice weekly at hours to be arranged.

Sections are organized in archery, badminton, volleyball, riding, swimming, lifesaving, and swimming formations.

This course may be repeated for credit not to exceed a total of 4 units.

PHYSICS

2A-2B. **General Physics Lectures.** (3-3) I and II.

Mr. Gardner, Mr. Patten, Mr. Skolil

I. 2A. Lectures, M W F, 9. Demonstration: Sec. 1, Th, 8; Sec. 2, Th, 9. 2B. Lectures, M W F, 8. Demonstration: Sec. 1, Tu, 9; Sec. 2, Tu, 10.

II. 2A. Lectures, M W F, 8. Demonstration: Sec. 1, Tu, 9; Sec. 2, Tu, 10.

2B. Lectures, M W F, 9. Demonstration: Sec. 1, Th, 8; Sec. 2, Th, 9.

Prerequisite: (1) either high school physics or chemistry; (2) trigonometry (may be taken concurrently).

Properties of matter, mechanics, heat, sound, light, electricity, and magnetism.

3A-3B. **General Physics Laboratory.** (1-1) I and II.

3A. Laboratory, W, 1-4.

Mr. Gardner, Mr. Patten, Mr. Skolil

3B. Laboratory, W, 1-4.

Recommended for students who elect Physics 2A-2B.

Mechanics, properties of matter, heat, sound, light, electricity, magnetism.

Experimental work planned to accompany the lectures in Physics 2A-2B.

4A. **General Physics.** (4) II.

Mr. Gardner, Mr. Patten

Lectures, M W F, 11; laboratory, M, 1-4.

Prerequisite: (1) high school physics or chemistry; (2) Mathematics

3A-3B, or its equivalent. Mathematics 3B may be taken concurrently. Not open to students majoring in agriculture except by permission of instructor.

Mechanics, properties of matter.

- 4B. **General Physics.** (4) I. Mr. Gardner, Mr. Patten
Lectures, M W F, 11; laboratory, M, 1-4.
Prerequisite: Physics 4A.
Electricity and magnetism.
- 4C. **General Physics.** (4) II. Mr. Gardner, Mr. Patten
Lectures, M W F, 10; laboratory, S, 9-12.
Prerequisite: Physics 4A.
Heat, wave motion, sound, light.
106. **Atomic Structure and Structure of Matter.** (3) II. Mr. Gardner
Lectures, Tu Th S, 8.
Prerequisite: one year of college physics and Chemistry 1A-1B.
An introduction to the fundamentals of atomic structure and the structure of matter with particular emphasis on processes of biological importance.
NOTE.—Given in the spring semesters of even-numbered years.
- *112. **Heat.** (3) I. Mr. Patten
Lectures, M W F, 9.
Prerequisite: Physics 4A, 4B, 4C, or consent of the instructor, and differential and integral calculus.
The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.
- *129. **Introduction to Electronics.** (3) II. Mr. Gardner
Lectures, M W F, 10.
Prerequisite: Physics 2B.
Elementary principles of single phase alternating current circuits, characteristics of thermionic tubes and a study of simple electronic circuits.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff
All special work of upper division grade not included in courses announced above.

PHYSIOLOGY

1. **Introductory Physiology Lecture.** (3) I. Mr. Casady
Lectures, M W F, 11.
Prerequisite: high school chemistry.
The physiology of muscle, nerve, central nervous system, sensation, circulation, respiration, excretion, and digestion.
11. **Introductory Physiology Laboratory.** (2) I. Mr. Casady
Laboratory, M F, 1-4.
Prerequisite: Physiology 1A completed or in progress.

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science, p. 170)

* Not to be given, 1949-1950.

PLANT PATHOLOGY

120. **Plant Diseases.** (4) II. Mr. Leach, Mr. Houston, Mr. Nyland
Lectures, Tu Th, 8. Laboratory: Sec. 1, Tu Th, 1-4; Sec. 2, W F, 1-4;
Sec. 3, Tu Th, 9-12.
Prerequisite: Botany 1 and Bacteriology 1.
A general course on the nature, cause, and control of plant diseases.
122. **Plant Pathology Methods.** (2) I. Mr. Hewitt
Laboratory, M, 1-4; one additional 3-hour period.
Prerequisite: Plant Pathology 120.
The laboratory methods and technique used in the study of plant diseases.
- 124A-124B. **Pathogenic Fungi.** (3-3) Yr. Mr. English, Mr. Nyland
Lecture, M, 1; laboratory, M, 2-5, W, 1-4.
Prerequisite: Botany 5 or Plant Pathology 120.
The morphology and taxonomy of the fungi with special emphasis on plant
pathogenes.
125. **Diseases of Crop Plants.** (2) II. Mr. Kendrick, Mr. E. E. Wilson
Laboratory, Tu Th, 1-4.
Prerequisite: Plant Pathology 120.
The pathology of important crop plants. Dissemination, factors influenc-
ing inception and severity of disease, diagnosis, host reaction, control.
NOTE.—Given in two parts in alternate years. (a) Truck and Field Crops,
1949-1950. (b) Deciduous Fruits, 1950-1951. Parts (a) and (b) may be taken
without duplication of credit.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Kendrick, Mr. Hewitt, Mr. Houston, Mr. Leach, Mr. Oswald,
Mr. E. E. Wilson, Mr. English, Mr. Grogan, Mr. Nyland

GRADUATE COURSE

- 230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Yr.
Mr. Hewitt, Mr. Houston, Mr. Kendrick, Mr. Leach, Mr. Oswald,
Mr. E. E. Wilson, Mr. English, Mr. Grogan, Mr. Nyland

POLITICAL SCIENCE

113. **American Political Theory.** (2) II. Mr. Shideler
Lectures, Tu Th, 9.
Underlying theories and principles of United States government and
policy.
This course will satisfy half of the American History and Institutions re-
quirement.
151. **American National Government.** (3) I. Mr. Puryear
Lectures, Tu Th, 9; discussion section arranged by the instructor.
Origin and development of the principles and practices of government
under the Constitution.
This course satisfies half of the American History and Institutions re-
quirement.

POMOLOGY

(For courses in Pomology, see Horticulture, p. 158)

POULTRY HUSBANDRY

1. **Poultry Production.** (3) II. Mr. Asmundson, Mr. Lorenz
Lectures, Tu Th, 9. Laboratory: Sec. 1, M, 1-4; Sec. 2, W, 1-4.
An introductory study of the relation of the several sciences underlying poultry production to flock management.
104. **Poultry Feeds and Feeding.** (3) I. Mr. Kratzer
Lectures, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Poultry Husbandry 106 (Berkeley) or Animal Husbandry 101, or Chemistry 101 (Davis).
A study of the manufacture, composition, and use of poultry feedstuffs; elementary feed analysis.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Asmundson in charge)
Prerequisite: Poultry Husbandry 1, courses basic to problem elected, and consent of the instructor.
Problems relating to the nutrition, breeding, incubation, physiology, and egg quality of chickens or turkeys may be elected.

GRADUATE COURSE

- 200A-200B. **Research in Poultry Husbandry.** (1-6; 1-6) Yr.
Mr. Asmundson, Mr. Kratzer, Mr. F. W. Lorenz, Mr. W. O. Wilson

PSYCHOLOGY

- 1A. **General Psychology.** (3) I. Mr. Bursch
Lectures, M W F, 10.
An introduction to the facts and principles of psychology.
2. **Survey of Psychology.** (3) I. Mr. Bursch
Lectures, M W F, 11.
Prerequisite: Psychology 1A. Not open for credit to students who have completed 1B.
A continuation of Psychology 1A intended primarily for students who will not continue in psychology. A survey of the special fields and applications of psychology.

PUBLIC HEALTH

- *5A. **Elementary Public Health.** (3) II. _____
Lectures, M W F, 10.
A general survey of the field of public health in the United States, including a consideration of the causes of death, sickness, and disability; the conservation of infant and child life; the home and the industrial environment; the noncommunicable diseases; and the presentation of health instruction.

* Not to be given, 1949-1950.

SOIL SCIENCE

Irrigation in Its Soil and Plant Relationships. (See Irrigation 100, page 160.)

106. **Elements of Soil Science.** (4) II. Mr. L. E. Davis
Lectures, M W F, 9. Laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4; Sec. 3, W, 1-4; Sec. 4, Th, 1-4.
Three off-campus field trips are required.
Prerequisite: Chemistry 1A.
The origin and properties of soil-forming rocks; the earth's surface features with special reference to soils and land use; development of soil as a natural body; soil profiles; physical, chemical, and biological properties of soil; soil structure; soil classification; soil mapping; a brief treatment of soil management.
110. **The Soil as a Medium for Plant Growth.** (4) I. Mr. Conrad
Lectures, M Tu W Th, 11.
Prerequisite: Chemistry 1A-1B, 8.
Composition and properties of soils; factors determining productivity; the causes and effects of the soils reaction, with particular reference to "acid" and "alkali" soils; the nature of fertilizers and some of their effects upon soil and plant; current theory of the soil solution.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

GRADUATE COURSE

- 200A-200B. **Research in Soil Science.** (1-6; 1-6) Yr.
Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

SPANISH

1. **Elementary Spanish—Beginning.** (4) I and II. Mr. Nelson
I. Lectures, M Tu W F, 11.
II. Lectures, M Tu W F, 10.
This course corresponds to the first two years of high school Spanish.
2. **Elementary Spanish—Continued** (4) I and II. Mr. Nelson
I. Lectures, M Tu W F, 10.
II. Lectures, M Tu W F, 11.
Prerequisite: Spanish 1 or two years of high school Spanish.

SPEECH

Students must have passed Subject A before taking any course in Speech. See English 1A-1B, "Reading, Composition, and Speech," page 151. This revised basic course provides training in speech.

- 1B. **Principles and Types of Speech.** (3) I and II. Mr. Guyer, Mrs. Needham
Lectures, M W F, 1.
Prerequisite: Speech 1A as offered in previous years; or English 1A-1B.

SUBJECT A

Subject A. English Composition. (No credit) I and II.

Mrs. Jasper, Mrs. Sikes

Lectures: Sec. 1, M W F, 8; Sec. 2, M W F, 9; Sec. 3, M W F, 11.

Required of all students who do not pass the examination in Subject A. Fee, \$20. Students who maintain an average grade of A during the first seven weeks of the semester will receive a refund of \$5 and will be excused from further attendance in the course.

TRUCK CROPS

1. **Vegetable Production.** (3) I and II. I. Mr. Lorenz; II. Mr. Hanna
Lectures, M W F, 8.
Principles involved in vegetable production; survey of the vegetable industry.
105. **Systematic Olericulture.** (3) I. Mr. Rick
Lecture, Th, 1; laboratory, Th, 2-5, S, 9-12.
Prerequisite: Truck Crops 1, Botany 1.
Origin, history, types, classification, nomenclature, adaptation, and judging of the more important American vegetable varieties. Two field trips will be made on Saturdays at an approximate total cost of \$10.
112. **Storage, Handling, and Transit of Vegetables.** (2) I. Mr. Morris
Lecture, Tu, 10; laboratory, F, 1-4.
Prerequisite: Truck Crops 1, Botany 7.
Postharvest deterioration of vegetables and the methods used for delaying it during marketing.
121. **Vegetable Physiology.** (3) II. Mr. Mann, Mr. Pratt
Lectures, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Truck Crops 1, Botany 7, or consent of the instructor.
Physiological principles involved in the production of vegetables.
122. **Advanced Truck Crops.** (3) I. Mr. Knott
Lectures, M W F, 11.
Prerequisite: Truck Crops 1 or consent of the instructor.
Methods of production and handling of the principal California vegetable crops, including the application of pertinent experimental evidence.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Knott in charge)

GRADUATE COURSES

- 200A-200B. **Research in Truck Crops.** (1-6; 1-6) Yr.
Mr. Knott, Mr. G. N. Davis, Miss Esau, Mr. Harrington, Mr. O. A. Lorenz, Mr. MacGillivray, Mr. Mann, Mr. Morris, Mr. Pratt, Mr. Rick, Mr. P. G. Smith
- 201A-201B. **Seminar in Truck Crops.** (1-1) Yr.
The Staff (Mr. Knott in charge)

VETERINARY SCIENCE

111. Principles of Pathology and Control of Diseases of Domestic Animals.

(3) II.

Mr. D. E. Jasper

Lectures, M W F, 9.

Prerequisite: Bacteriology 1 or 2.

The causes, pathology, prevention, and control of animal diseases in relation to economic production and public health.

NOTE.—This course or Entomology 116 meets the requirement of 3 units of parasitology in the animal science curriculum.

120. Anatomy of Domestic Animals. (9) I.

Mr. Hart, Mr. DeOme, Mr. Julian, Mr. Schalm

Lectures, M Tu W F, 11; laboratory, M Tu W F, 1-4, S, 8-11.

Prerequisite: open only to students in the School of Veterinary Medicine.

Lectures, demonstrations, and student dissection of domestic animals.

121. Microbiology. (10) II.

Mr. Hinshaw, Mr. Beach

Lectures, M Tu W Th F, 11; laboratory, M Tu W Th F, 1-4.

Prerequisite: Zoölogy 1A-1B. Open only to students in the School of Veterinary Medicine.

122. Comparative Pathology. (10) I.

Mr. Jasper, Mr. DeOme

Lectures, M Tu W Th F, 11; laboratory, M Tu W Th F, 1-4.

Prerequisite: second-year standing in the School of Veterinary Medicine.

Qualified graduate students admitted with consent of instructor.

123. Comparative Pharmacology. (10) II.

Mr. Peoples

Lectures, M Tu W Th F, 11; laboratory, M T W Th F, 1-4.

Prerequisite: a satisfactory course in physiology and anatomy. Second-year standing in the School of Veterinary Medicine.

The action of drugs on the physiological mechanism of domestic animals. Laboratory exercises and demonstrations to illustrate the principles of pharmacology, chemotherapy, and toxicology.

124. Veterinary Science (Parasitology). (4) II.

Mr. Douglas

Lectures, M W, 8; laboratory, M W, 9-12.

The metazoan parasites of domesticated animals with emphasis on biology, life history, and control.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. Hart in charge)

GRADUATE COURSE

200A-200B. Research in Animal Pathology. (1-6; 1-6) Yr.

Mr. Hart, Mr. H. S. Cameron, Mr. Hinshaw, Mr. D. E. Jasper

VITICULTURE

(For courses in Viticulture and Enology, see Horticulture, p. 158)

ZOOLOGY

- 1A. **General Zoölogy.** (4) I. Mr. Storer, Mr. Miller, Mr. Hildebrand
Lectures, M W, 10. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4;
Sec. 3, W, 1-4, S, 9-12; Sec. 4, Tu Th, 9-12.
Introduction to the structure, physiology, classification, and interrelations
of animals, and the principles of evolution and heredity.
- 1B. **General Zoölogy.** (4) II. Mr. Miller
Lectures, Tu Th, 8. Laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4; Sec.
3, W, 1-4, S, 9-12; Sec. 4, Tu Th, 9-12.
Prerequisite: Zoölogy 1A.
Structure of the vertebrate body with special reference to the mammal
and bird; gross and microscopic anatomy of organs and organ systems.
10. **General Biology.** (3) II. Mr. Hildebrand
Lectures, M W F, 10; conference section to be arranged.
Not open for credit to students who have had Zoölogy 1A, but students
who have taken Zoölogy 10 may elect Zoölogy 1A for credit.
An outline of the main facts and principles of animal biology, with special
reference to evolution, heredity, and the bearing of biology upon human life.
Open without prerequisite to all students, but designed for those not special-
izing in zoölogy.
- 100A. **Vertebrate Embryology.** (2) I. Mr. Rosenberg, Mr. Hildebrand
Lectures, Tu Th, 8.
Prerequisite: Zoölogy 1B.
Study of embryologic development of the vertebrates, including amphib-
ian, chick, and mammal.
- 100C. **Vertebrate Embryology Laboratory.** (2) I.
Mr. Rosenberg, Mr. Hildebrand
Laboratory: Sec. 1, Tu Th, 9-12; Sec. 2, W, 1-4, S, 9-12.
Prerequisite: Zoölogy 100A, which should be taken concurrently.
104. **Materials and Methods of Animal Micrology.** (3) II. Mr. Rosenberg
Lecture, 1 hour to be arranged. Laboratory: Sec. 1, Tu Th, 9-12; Sec. 2,
Tu Th, 1-4.
Prerequisite: Zoölogy 1A-1B and at least sophomore standing.
A consideration of apparatus and methods for microscopic work in the
animal sciences with emphasis on practical applications.
107. **Microanatomy.** (4) II. Mr. Rosenberg
Lecture, M W, 4. Laboratory: Sec. 1, Tu Th, 8-11; Sec. 2, Tu Th, 1-4.
Prerequisite: Zoölogy 1B.
The finer structure and activities of organs, tissues, and cells of verte-
brates, with the emphasis on mammals.
- *110. **Protozoölogy.** (4) II. Mr. Rosenberg
Lecture, M W, 9; laboratory, M F, 1-4.
Prerequisite: Zoölogy 1A and at least sophomore standing.
A study of the structures, life history, and ecology of the groups of pro-
tozoa with emphasis on relationships to biological problems.
NOTE.—Given in the spring semesters of even-numbered years.

* Not to be given, 1949-1950.

116. Economic Vertebrate Zoölogy. (3) II.

Mr. Storer

Lectures, Tu Th, 11; laboratory, W, 1-4.

Prerequisite: Zoölogy 1A and junior standing.

Relation of vertebrate animals to human affairs; effect of settlement, lumbering, agricultural operations, and hunting on wild animal populations; attention to rodents, deer, carnivorous mammals and birds, fur production, game birds, food and game fishes; principles of and agencies concerned with animal management and conservation.

Minimum enrollment of 5 students.

199. Special Study for Advanced Undergraduates. (1-5) I and II.

The Staff (Mr. Storer in charge)

GRADUATE COURSE

200A-200B. Research in Zoölogy. (1-6; 1-6) Yr.

The Staff (Mr. Storer in charge)

1949-1950
COURSES OF INSTRUCTION
OFFERED AT LOS ANGELES

COURSES OFFERED ON THE LOS ANGELES CAMPUS†

AGRICULTURAL ECONOMICS

- 101A. **Principles of Marketing Agricultural Products.** (3) II. Mr. Naden
Lectures and discussions, 3 hours. Three field trips to be arranged.
Prerequisite: Economics 1A-1B.
Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products. Government in its relation to marketing; consideration of proposals for improvement.
- *116. **Agricultural Policy.** (3) II. Mr. R. J. Smith
Lectures and discussions, 3 hours.
Prerequisite: Economics 1A-1B.
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
118. **Farm Management: Business Organization.** (3) II. Mr. R. J. Smith
Lectures and discussions, 3 hours. Three field trips to be arranged.
The place, purpose, and scope of organization; community and farm basis; farm enterprise; selecting farms; planning and equipping; capital needs; earnings.

BOTANY

1. **General Botany.** (5) I. Mr. Addicott
Lectures, 3 hours; laboratory, 6 hours.
An introduction to the plant sciences.
2. **Plant Morphology.** (4) II. Mr. Haupt
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Botany 1 or equivalent.
The evolution of the plant kingdom, dealing with the comparative morphology of all the great plant groups.
3. **Field Botany.** (4) II. Mr. Lewis
Lectures, 2 hours; laboratory or field, 6 hours.
Prerequisite: Botany 1 or equivalent.
An introduction to the life habits, interrelationships, and classification of native and ornamental plants.
6. **Plant Anatomy.** (4) I. Miss Scott
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Botany 1 or equivalent.
The microscopic study of structure and development of higher plants in relation to the functions of the tissues.
103. **Botany of Economic Plants.** (2) II. Miss Scott
Designed for students of economics, geography, agriculture, and botany.
The general morphology, classification, ecology and geographic distribution, origin, and use of economic plants.

† See page 105 for explanation of classification and numbering.

* Not to be given, 1949-1950.

- 105A. **Algae and Bryophytes.** (4) I. Mr. Haupt
 Lectures, 2 hours; laboratory, 6 hours.
 Prerequisite: Botany 1 and 2, or equivalent.
 A study of the structure, development, and phylogenetic relationships of the principal orders of fresh water and marine algae, and of liverworts and mosses.
- 105B. **Morphology of Vascular Plants.** (4) II. Mr. Haupt
 Lectures, 2 hours; laboratory, 6 hours.
 Prerequisite: Botany 1 and 2, or equivalent.
 Structure, development, and phylogenetic relationships of the principal groups of pteridophytes and spermatophytes.
107. **Introduction to Plant Physiology.** (4) II. Mr. Addicott
 Lecture-discussion and laboratory, 8 hours.
 Prerequisite: Botany 1 and 6 and Chemistry 1A-1B or equivalent.
 A survey of the more important aspects of water relations, mineral nutrition, photosynthesis, assimilation, respiration, and coördination in higher plants.
- *111. **Plant Cytology.** (3) II. Miss Scott
 Lecture, 1 hour; laboratory, 6 hours.
 Prerequisite: Botany 1, 2, 6, and 107.
 Structure and physiology of the cell.
- *112. **Experimental Plant Anatomy.** (3) I. Mr. Phinney
 Lecture, 1 hour; laboratory, 6 hours.
 Prerequisite: Botany 1, 6, 107, and 140.
 Quantitative aspects of development and differentiation in higher plants.
113. **Physiological Plant Anatomy.** (3) II. Miss Scott
 Lecture, 1 hour; laboratory, 6 hours.
 Prerequisite: Botany 1, 6, and 107.
 A survey of the tissues of the higher plants in relation to function.
119. **Mycology.** (3) I. Mr. Plunkett
 Lecture, 1 hour; laboratory, 6 hours.
 Prerequisite: Botany 1 and 2.
 For students of botany, bacteriology, agriculture, and forestry.
 Structure, development, and classification of the important genera and species of fungi.
126. **Medical Mycology.** (4) II. Mr. Plunkett
 Lectures, 2 hours; laboratory, 6 hours.
 Prerequisite: Botany 1, 2, and 119, or Bacteriology 1. This course is designed for students in bacteriology, parasitology, and medicine.
 An introduction to the morphology, physiology, and taxonomy of the parasites which cause disease in man and the domestic animals.
140. **Plant Genetics.** (4) I. Mr. Phinney
 Lectures, 3 hours; laboratory, 3 hours.
 Prerequisite: Botany 1 or equivalent.
 The fundamentals of genetics with special reference to plants.

* Not to be given, 1949-1950.

- *141. **Plant Cytogenetics.** (4) II. _____
Lectures and laboratory.
- *150. **Ecology.** (3) II. _____
Lectures, 2 hours; laboratory and field, 3 hours.
Field and laboratory studies of plant communities and their relation to the environment.
151. **Taxonomy of the Seed Plants.** (3) I. Mr. Lewis
Lecture, 1 hour; laboratory, 6 hours and additional field work.
Prerequisite: Botany 1 and 3, or equivalent.
The fundamentals of systematic botany. A survey of the orders and families commonly met with in the native and cultivated floras.
152. **Advanced Systematic Botany.** (3) II. Mr. Lewis
Lecture, 1 hour; laboratory or field work, 6 hours.
Prerequisite: Botany 151, or equivalent, and consent of the instructor.
Field and laboratory study of natural variation in relation to spatial distribution.
153. **Population Genetics.** (2-2) Yr. Mr. Epling
Lecture and discussion, 2 consecutive hours.
Prerequisite: consent of the instructor.
The processes of evolutionary change in natural populations.
- 160A-160B. **Plant Physiology.** (4-4) Yr. Mr. Hamner
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Botany 1, 6, 107, and Chemistry 8, or equivalents. Chemistry 5A is recommended.
Physiology of the higher plants including water relations, mineral nutrition, pigments, photosynthesis, assimilation, translocation, respiration, growth, dormancy, hormones, and periodicity. An advanced course employing quantitative laboratory methods. Designed for students expecting to enter graduate work in the botanical or horticultural sciences.
- *165. **Plant Biochemistry.** (4) II. _____
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Chemistry 8 and Botany 160A-160B, or equivalents.
The chemistry of plants and plant products.
190. **Research Methods in Morphology.** (4) I. Mr. Phinney
Lecture, 1 hour; laboratory, 9 hours.
Prerequisite: consent of the instructor.
The theory and methods of preparing plant materials for microscopic study.
- 191A-191B. **Molecular Structure of Biological Materials.** (2-2) Yr. Mr. Hamner
Prerequisite: senior standing or the consent of the instructor; Physics 2A-2B, Chemistry 8, and Botany 1 and 2, or Zoölogy 1, 2, and, in addition, advanced courses in biological fields.
An adaptation of our knowledge of atomic and molecular structure to biological concepts of protoplasm and cell parts.

* Not to be given, 1949-1950.



Students working with plant materials in propagation class, Los Angeles campus

College of Agriculture

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- 199A-199B. **Problems in Botany.** (2-4; 2-4) Yr. The Staff
Prerequisite: senior standing.

GRADUATE COURSES

- 252A-252B. **Seminar in Principles and Theories of Botany.** (2-2) Yr. The Staff
253A-253B. **Seminar in Plant Anatomy.** (1-1) Yr. Miss Scott
254A-254B. **Seminar in Plant Physiology.** (1-1) Yr. Mr. Addicott
255A-255B. **Seminar in Systematics.** (1-1) Yr. Mr. Epling
256A-256B. **Seminar in Plant Morphology.** (1-1) Yr. Mr. Haupt
257A-257B. **Seminar in Mycology.** (1-1) Yr. Mr. Plunkett
278A-278B. **Research in Botany.** (2-6; 2-6) Yr. The Staff

ENTOMOLOGY

1. **General Entomology.** (4) II. Mr. Belkin
Lectures, 3 hours; laboratory, 3 hours.
The classification, life history, structure, and physiology of insects.
134. **Insects Affecting Subtropical Fruit Plants.** (4) II. Mr. Ebeling
Lectures, 2 hours; laboratory, 6 hours. Weekly field trips during last half of the course.
Recommended preparation: Zoölogy 1, Entomology 1.
Biology, economic importance, and control of insects affecting citrus and other subtropical fruits. Insecticides; spraying, dusting, and fumigating methods and equipment.
- *144. **Insects Affecting Ornamental Plants and Flower Crops.** (4) II.
Lectures, 3 hours; laboratory, 3 hours. Mr. Jefferson, Mr. Brown
Recommended preparation: Zoölogy 1, Entomology 1.
Offered in alternate years.
Biology, economic importance, and control of insects affecting field flower crops, greenhouse and nursery plants, and ornamental trees and shrubs. Insecticides; spraying, dusting, and fumigating methods and equipment.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr. The Staff
Prerequisite: senior standing and the consent of the instructor.

IRRIGATION AND SOILS

105. **Principles of Irrigation.** (4) II. Mr. Pillsbury
Lectures, 3 hours; laboratory, 3 hours.
Prerequisite: Physics 2A-2B, or the equivalent.
Irrigation as a factor in agriculture; soil-plant water relations; hydraulics of farm irrigation systems.

* Not to be given, 1949-1950.

- 110A. **The Soil as a Medium for Plant Growth.** (3) II. Mr. Appleman
Lectures, 3 hours.
Prerequisite: Chemistry 1A-1B and 8, or the equivalent.
Nutritional requirements of plants; studies of the absorption of mineral elements by plants, and related processes; chemical composition of soils; current views of the soil solution and of base exchange; factors determining productivity of soils; soil and plant interrelations.
126. **Development and Characteristics of Soils.** (3) I. Mr. Huberty
Lectures, 3 hours.
Prerequisite: introductory college chemistry and physics; geology recommended.
An introduction to the origin, classification, and utilization of soils, and to their physical and chemical properties.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
The Staff
Prerequisite: senior standing and the consent of the instructor.

GRADUATE COURSE

- 280A-280B. **Research in Irrigation and Soils.** (2-4; 2-4) Yr.
The Staff (Mr. Huberty in charge)

ORNAMENTAL HORTICULTURE

- 131A-131B. **Taxonomic Classification and Ecology of Ornamental Plants.**
(3-3) Yr. Mr. Stoutemyer
Lectures, 2 hours; laboratory, 3 hours; several field trips.
Prerequisite: Botany 1 or equivalent.
The botanical classification, relationships, and identification of the more important ornamental plants in southern California with special emphasis on their environmental requirements and adaptations.
136. **General Floriculture.** (4) II. Mr. Crummett, Mr. Stoutemyer
Lectures, 2 hours; laboratory, 6 hours; several field trips.
Prerequisite: Subtropical Horticulture 110 or the equivalent.
Principles and practices of general floriculture, with special reference to the more important flower crops grown in California.
146. **Plant Breeding.** (3) II. Mr. Johnson
Lectures, 2 hours; laboratory, 3 hours.
Prerequisite: Botany 140 or equivalent.
Applications of genetics and cytogenetics to the breeding of horticultural plants.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
The Staff
Prerequisite: senior standing and the consent of the instructor.

GRADUATE COURSE

- 286A-286B. **Research in Ornamental Horticulture.** (2-6; 2-6) Yr.
The Staff

PLANT PATHOLOGY

120. **Plant Diseases.** (4) I. Mr. Baker, ——
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Botany 1 or the equivalent, and Bacteriology 1.
A general fundamental course treating of the nature, cause, and control of plant diseases.
130. **Diseases of Subtropical Fruit Plants.** (4) I. Mr. Miller
Lectures, 3 hours; laboratory, 3 hours.
Prerequisite: Botany 1 or the equivalent, and Bacteriology 1; Plant Pathology 120 is recommended.
The pathology of citrus and other subtropical fruit plants. The distribution, economic importance, nature, cause, and control of the principal diseases.
140. **Diseases of Floricultural Plants.** (3) I. Mr. Baker, Mr. Bald
Laboratory, lecture, and discussion, 9 hours. Several field trips.
Prerequisite: Plant Pathology 120 or equivalent (may be taken concurrently).
The pathology of floricultural plants in relation to the cultural practices. Recognition, environmental relations, etiology, and control of important types of diseases.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr. The Staff
Prerequisite: senior standing and the consent of the instructor.

GRADUATE COURSE

- 282A-282B. **Research in Plant Pathology.** (2-6; 2-6) Yr. The Staff

SUBTROPICAL HORTICULTURE

2. **Elements of Fruit Production.** (3) I. Mr. Halma
Lectures, 3 hours.
Prerequisite: Botany 1 or the equivalent. This course is equivalent to Horticulture 2, given at Berkeley and at Davis.
The principles and practices of fruit growing, with special reference to subtropical regions. The climatic, soil, and moisture requirements and adaptations of fruit trees; selection of site, propagation, planting, orchard management practices, harvesting, and preparation for market.
- *100. **Systematic Pomology.** (4) I. Mr. Schroeder
Lectures, 2 hours; laboratory, 6 hours.
Prerequisite: Subtropical Horticulture 2 or the equivalent.
The botanical classification and relationships of the principal fruits; horticultural races and groups; growth and bearing habits; bud and fruit morphology; varietal characters.

* Not to be given, 1949-1950.

101. **Citriculture.** (4) II. Mr. Hodgson, Mr. Schroeder
Lectures, 3 hours; laboratory, 3 hours; four or five Saturday field trips.
Prerequisite: Chemistry 1A-1B, Subtropical Horticulture 2, or the equivalent.

The characteristics of the citrus fruits and their responses to environmental influences and cultural practices; the economics of the citrus fruit industry.

102. **Subtropical Fruits Other Than Citrus.** (3) I. Mr. Schroeder
Lectures, 3 hours; three field trips.
Prerequisite: Subtropical Horticulture 2 or the equivalent.

A survey of the knowledge concerning the requirements and responses of the subtropical fruit plants other than citrus; the economics of their industries. The fruits considered will include the walnut, pecan, almond, fig, olive, avocado, date, oriental persimmon, and certain others of minor importance.

110. **Plant Propagation.** (2) II. Mr. Cameron
Laboratory and conference, 6 hours; three field trips.
Prerequisite: Botany 1, Botany 6 and 107 (may be taken concurrently) recommended.

Principles and practices in plant propagation.

111. **Respiration and Respiratory Enzymes.** (2) I. Mr. Biale
Lecture-discussion, 2 hours.
Prerequisite: organic chemistry.

Basic concepts of respiration; aerobic and anaerobic processes; the Pasteur effect; respiratory substrates, intermediates, and end products; kinetics and mechanisms of enzyme action; proteins and prosthetic groups of enzymes; oxidases, dehydrogenases and carriers; phosphorylations; metabolic and enzyme cycles.

113. **Fruit Physiology and Storage Problems.** (2) II. Mr. Biale
Lectures and discussions, 2 hours.
Prerequisite: Botany 107 or equivalent.

Anatomical, physiological, and chemical changes in developing fruits; composition of mature fruits; maturity standards; respiratory and fermentative processes; production of emanations; low temperature effects; ordinary and modified air storage; field, packing house, and transit practices; frozen fruit products; specific fruit problems.

- 199A-199B. **Special Study of Advanced Undergraduates.** (2-4; 2-4) Yr.
The Staff
Prerequisite: senior standing and the consent of the instructor.

GRADUATE COURSES

- 204A-204B. **Advanced Horticulture.** (3-3) Yr. Mr. Cameron
Lectures and discussions, 3 hours.
Prerequisite: graduate standing and consent of the instructor.
A critical review and discussion of horticultural research in selected fields.

- 255A-255B. **Seminar in Horticultural Science.** (2-2) Yr. The Staff

- 281A-281B. **Research in Subtropical Horticulture.** (2-6; 2-6) Yr. The Staff

1949-1950
COURSES OF INSTRUCTION
OFFERED AT RIVERSIDE

COURSES OFFERED ON THE RIVERSIDE CAMPUS*

GRADUATE COURSES

ENTOMOLOGY

- 200A-200B. **Seminar in Entomology, Including Biological Control.** (1-1) Yr.
The Staff (Entomology, Mr. Boyce in charge; Biological Control,
Mr. H. S. Smith in charge)
- 201A-201B. **Research in Entomology.** (2-6; 2-6) Yr.
Mr. Boyce, Mr. H. S. Smith
- 205A-205B. **Research in Biological Control.** (2-6; 2-6) Yr. Mr. H. S. Smith

HORTICULTURE

- 201A-201B. **Research in Subtropical Horticulture.** (1-6; 1-6) Yr.
Mr. Condit

PLANT PATHOLOGY

- 201A-201B. **Seminar in Plant Pathology.** (1-1) Yr.
The Staff (Mr. Klotz in charge)
- 230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Yr. Mr. Klotz

PLANT PHYSIOLOGY

- 203A-203B. **Research in Plant Physiology.** (1-6; 1-6) Yr. ———
- 205A-205B. **Seminar in Plant Physiology.** (1-1) Yr.
The Staff (———— in charge)

SOIL SCIENCE

- 202A-202B. **Research in Soils.** (1-6; 1-6) Yr. Mr. Chapman
- 237A-237B. **Seminar in Soils.** (1-1) Yr.
The Staff (Mr. Chapman in charge)

* See page 105 for explanation of classification and numbering.

UNIVERSITY OF CALIFORNIA
BULLETIN

Announcement of the
*School of
Veterinary Medicine*

COLLEGE OF AGRICULTURE

1949-1950

FEBRUARY 1, 1949

BERKELEY · CALIFORNIA

University of California Bulletin

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through October.



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Changes may be made subsequent to the
date of publication, February 1, 1949.

SCHOOL OF VETERINARY MEDICINE

THE SCHOOL OF VETERINARY MEDICINE offers a two-year curriculum leading to the degree of Bachelor of Science and a two-year graduate curriculum leading to the degree of Doctor of Veterinary Medicine.

ADMISSION TO THE SCHOOL OF VETERINARY MEDICINE

Candidates for admission to the School of Veterinary Medicine must complete:

A. Mathematics through trigonometry; Subject A, military or naval science, and American History and Institutions, as required.

B. At least 60 units of work in one of the colleges of the University of California or in an accredited institution offering the prescribed courses (except that minor shortages may be waived by the Admissions Committee of the School of Veterinary Medicine), including:

1. English composition and additional English or speech	6
2. Chemistry (general, inorganic, and organic)	13
3. Zoölogy (including embryology)	10
4. Physics (mechanics, heat, light, electricity)	6
5. Statistics	3
6. Restricted electives*	12

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The preveterinary curriculum offers a well-balanced basic training in natural science and the humanities which will not only prepare the candidate for the courses of the School of Veterinary Medicine, but also to meet the varied problems of his chosen profession. This course of study can be completed on any of the campuses of the University, or at any junior college or four-year college offering the prescribed courses. Enrollment in the School is limited, with the candidates being selected in major part on the basis of scholarship. The student should, therefore, plan his program in such a way that in the event that he fails to enter the School of Veterinary Medicine, he can complete the requirements for the bachelor's degree in some other curriculum without loss of time.

Students are admitted to the School of Veterinary Medicine in the fall of each year. The necessary application blanks may be obtained from the Recorder, University of California, Davis, and filed with him before April 1. All the requirements need not be completed at that time, but the student must supply a transcript showing work in progress.

Admission in Advanced Standing.—An applicant for admission in advanced standing may be accepted under the following conditions:

1. He must furnish evidence that he was eligible for admission to the first semester of the School of Veterinary Medicine.

* Courses selected from the fields of social sciences, foreign languages, philosophy, psychology, fine arts, and literature, and/or additional courses in English, speech, and mathematics.

2. He must show that he has satisfactorily completed courses equivalent in kind and amount to those given in the School of Veterinary Medicine in the semester or semesters preceding that to which admission is desired.
3. He may be required to pass examinations in any or all subjects for which credit is asked.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

The degree of Bachelor of Science is granted, upon the recommendation of the Faculty of the College of Agriculture, to students who:

1. Satisfy the general University and College of Agriculture requirements,* including:
 - (a) Subject A.
 - (b) Military or Naval Science.
 - (c) American History and Institutions.
 - (d) Residence at Davis during the final undergraduate year in the School of Veterinary Medicine.
 - (e) Attainment of at least as many grade points as units of credit in courses undertaken at this University.
2. Complete, in the School of Veterinary Medicine, the following 64 units of prescribed courses. This total may be reduced in the case of students with advanced standing.

(a) Biochemistry	5
(b) Physiology	5
(c) Genetics	4
(d) Botany	2
(e) Animal Science†	8
(f) Veterinary Science	36
(g) Parasitology	4
	64

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF VETERINARY MEDICINE

A. The candidate for the degree of Doctor of Veterinary Medicine must have completed the requirements for the bachelor's degree in one of the colleges or schools of the University of California or at another college or university of approved standing.

B. He must give satisfactory evidence of possessing a good moral character.

* See page 59 of the 1948-1949 PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

† Any lower or upper division courses in the divisions of Animal Husbandry, Dairy Industry and/or Poultry Husbandry.

C. He must have studied veterinary medicine for the equivalent of eight semesters of sixteen weeks each. The last two years must have been spent in the University of California School of Veterinary Medicine. He must have completed the required work, have fulfilled satisfactorily all special requirements, and have received throughout the entire veterinary course a satisfactory grade, as determined by the Faculty of the School and by the Graduate Council of the Northern Section.

PLAN OF STUDY

PREVETERINARY CURRICULUM

THE FOLLOWING schedule of study need not be rigidly adhered to but it satisfies the requirements without conflicts. This schedule also satisfies the general requirements of the Animal Science Curriculum if Botany 1, Geology or Soils, Bacteriology 1, and Economics 1A, 1B are taken as electives.

FRESHMAN YEAR	<i>Fall</i> Units	<i>Spring</i> Units	SOPHOMORE YEAR	<i>Fall</i> Units	<i>Spring</i> Units
Military Science	2	2	Military Science	2	2
English 1A	3		Chemistry 8	3	
English 1B or Speech 1A.		3	Physics 2A, 2B	3	3
Chemistry 1A, 1B	5	5	Mathematics 13		3
Zoölogy 1A, 1B	4	4	Zoölogy 100A	2	
Elective	3	3	Electives	6	9
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	17	17		16	17

VETERINARY CURRICULUM

The completion of the first two years of the curriculum of the School of Veterinary Medicine satisfies the requirements of the Bachelor of Science degree in the College of Agriculture. The courses are primarily preclinical sciences but are closely correlated with and are basic to the work in the clinical sciences of the last two years.

The following are the schedules for the first two years of the School of Veterinary Medicine, corresponding to the junior and senior years of undergraduate study. The graduate curriculum in the School of Veterinary Medicine will not be offered until 1950.

Junior Year

FALL	Units	SPRING	Units
Veterinary Science 120	9	Veterinary Science 121	10
(Anatomy)		(Microbiology)	
Animal Husbandry 110	5	Animal Husbandry 101, 102..	5
(Physiology)		(Biochemistry)	
Genetics 100	4	Animal Science	2- 3
	<hr/>		<hr/>
	18		17-18

Senior Year

FALL	Units	SPRING	Units
Veterinary Science 122	10	Veterinary Science 123	10
(Histo-pathology)		(Pharmacology)	
Animal Science	6	Botany 8	2
		(Poisonous Plants)	
		Veterinary Science 124	4
		(Parasitology)	
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	16		16

UNIVERSITY OF CALIFORNIA **BULLETIN**

Announcement of the

TWO-YEAR CURRICULA IN AGRICULTURE

APRIL 10, 1949

FALL AND SPRING SEMESTERS, 1949-1950

COLLEGE OF AGRICULTURE • DAVIS, CALIFORNIA



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UNIVERSITY OF CALIFORNIA

Announcement of the

Two-Year Curricula

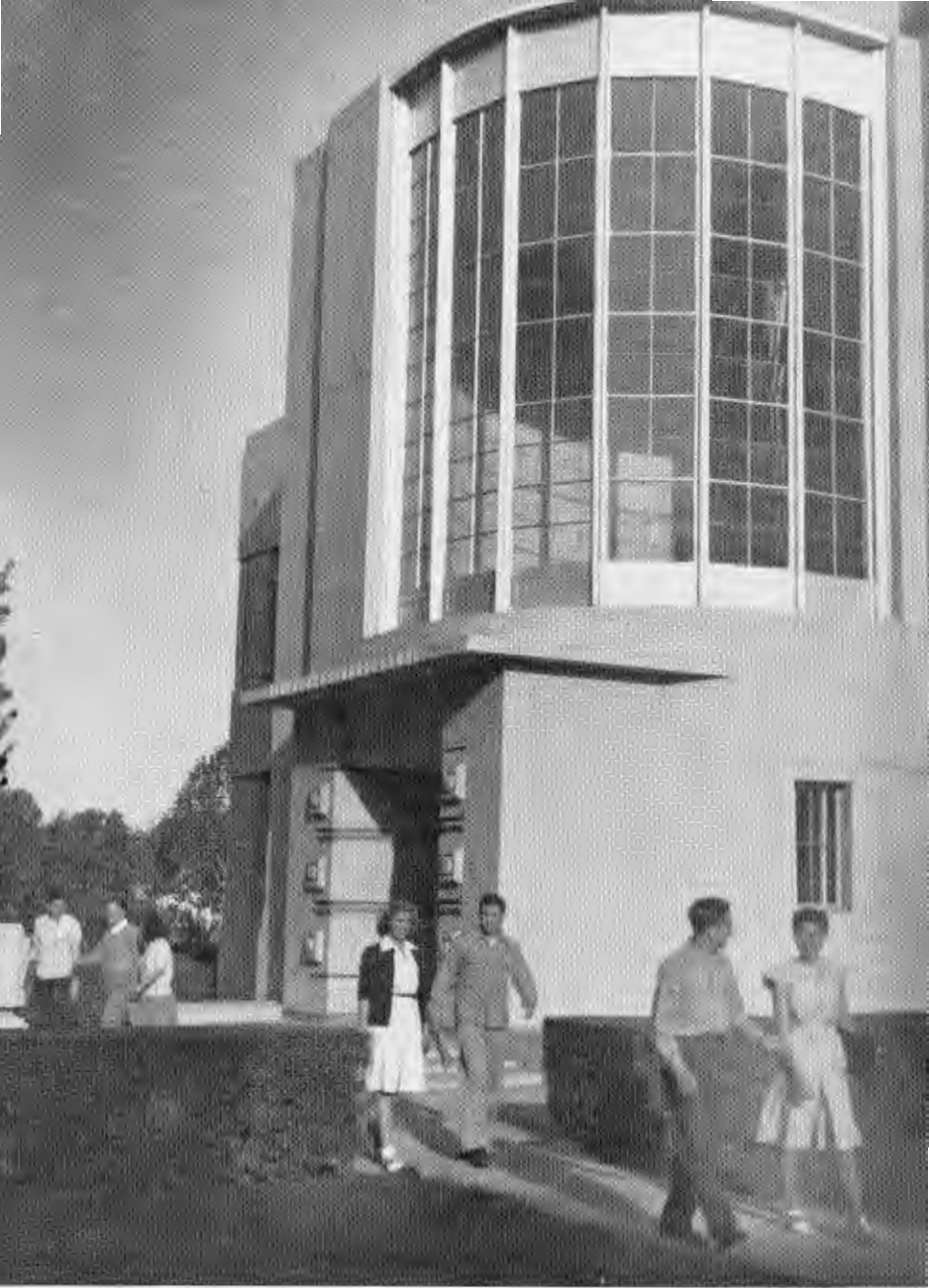
College of Agriculture

DAVIS

Fall and Spring Semesters

1949-1950

APRIL 10, 1949



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CALENDAR, 1949-1950

The College of Agriculture, Davis

Fall Semester, 1949-1950

Sept. 12, Monday	Fall Semester begins.
Sept. 15, Thursday	} Registration.
Sept. 16, Friday	
Sept. 19, Monday	Instruction begins.
*Nov. 24, Thursday	Thanksgiving Day.
Dec. 19, Monday	} Christmas recess (Academic holiday).
Jan. 2, Monday	
*Dec. 24, Saturday	} Christmas holiday.
*Dec. 26, Monday	

1950

*Jan. 2, Monday	New Year's holiday.
Jan. 3, Tuesday	Instruction resumes.
Jan. 14, Saturday	Instruction ends.
Jan. 16, Monday	} Final examinations.
Jan. 24, Tuesday	

Spring Semester, 1950

Feb. 6, Monday	Spring Semester begins.
Feb. 9, Thursday	} Registration.
Feb. 10, Friday	
Feb. 13, Monday	Instruction begins.
*Feb. 22, Wednesday	Washington's Birthday.
April 24, Monday	} Spring recess.
April 29, Saturday	
*May 30, Tuesday	Memorial Day.
June 3, Saturday	Instruction ends.
June 5, Monday	} Final examinations.
June 13, Tuesday	

* Academic and Administrative holiday.



AN AGRONOMY FIELD LABORATORY EXERCISE

THE UNIVERSITY OF CALIFORNIA

GENERAL OFFICERS OF ADMINISTRATION

- ROBERT GORDON SPROUL, B.S., LL.D., Litt.D., President of the University.
CLAUDE B. HUTCHISON, M.S., LL.D., D.Agr. (hon.c.), Vice-President of the University and Dean of the College of Agriculture.
CLARENCE A. DYKSTRA, A.B., L.H.D., LL.D., Litt.D., Vice-President and Provost of the University.
MONROE E. DEUTSCH, Ph.D., LL.D., Vice-President and Provost of the University, Emeritus.
ROBERT M. UNDERHILL, B.S., Secretary and Treasurer of the Regents.
JAMES H. CORLEY, B.S., Comptroller (General Business Manager).
HERMAN A. SPINDT, Ph.D., University Admissions Director.
HIRAM W. EDWARDS, Ph.D., Director of Relations with Schools.

COLLEGE OF AGRICULTURE

ADMINISTRATIVE OFFICERS

- CLAUDE B. HUTCHISON, M.S., LL.D., D.Agr. (hon.c.), Vice-President of the University, Dean of the College of Agriculture, and Professor of Agriculture (Berkeley).
PAUL F. SHARP, Ph.D., Director of the Agricultural Experiment Station and Biochemist in the Experiment Station (Berkeley).

AT DAVIS

- KNOWLES A. RYERSON, M.S., Assistant Dean of the College of Agriculture, Professor of Horticulture, and Horticulturist in the Experiment Station.
J. PRICE GITTINGER, Ed.M., Assistant to the Dean, Supervisor of Student Affairs, and Coördinator of Veterans Affairs. 204 Library and Administration Building.
FREDERICK L. GRIFFIN, M.S., Supervisor of the Two-Year Curricula and Associate Professor of Agricultural Education. 211 Library and Administration Building.
———, Adviser to Women. Home Economics Building.
HOWARD B. SHONTZ, B.S., Recorder. 201 Library and Administration Building.
NELLE U. BRANCH, A.B., Librarian.
IRA F. SMITH, B.S., Assistant Comptroller and Business Manager.
JOHN HOMER WOOLSEY, M.D., Director of Student Health Service and Surgeon, and Associate Clinical Professor of Surgery.
CHARLES B. FENN, B.S., Residence Halls Supervisor. 111 Library and Administration Building.

AT BERKELEY

STANLEY B. FREEBORN, Ph.D., Assistant Dean of the College of Agriculture, Assistant Director of the Agricultural Experiment Station, and Professor of Entomology.

HARRY R. WELLMAN, Ph.D., Director of the Giannini Foundation, Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, and Agricultural Economist on the Giannini Foundation.

AT LOS ANGELES

ROBERT W. HODGSON, M.S., Assistant Dean of the College of Agriculture, Professor of Subtropical Horticulture, and Subtropical Horticulturist in the Experiment Station.

AT RIVERSIDE

LEON D. BATCHELOR, Ph.D., Director of the Citrus Experiment Station, Professor of Horticulture and Horticulturist in the Experiment Station.

DIVISIONS AND OFFICERS OF INSTRUCTION IN THE TWO-YEAR CURRICULA

Agricultural Economics: GEORGE L. MEHREN, TRIMBLE R. HEDGES, RUSSELL T. ROBINSON.

Agricultural Engineering: ROY BAINER, NORMAN B. AKESSON, HERBERT L. BELTON, JAMES P. FAIRBANK, S. MILTON HENDERSON, HAROLD D. LEWIS, COBY LORENZEN, JR., JAMES R. TAVERNETTI.

Agronomy: FRED N. BRIGGS, LUTHER G. JONES, PAULDEN F. KNOWLES, CHARLES W. SCHALLER, FRANCIS L. SMITH.

Animal Biology: TRACY I. STORER, VIGFUS S. ASMUNDSON, ROBERT B. CASADY, PERRY T. CUPPS, HAROLD GOSS, PAUL W. GREGORY, MAX KLEIBER, F. HOWARD KRATZER, FREDERICK W. LORENZ, MILTON A. MILLER.

Animal Husbandry: ELMER H. HUGHES, HAROLD R. GUILBERT, HUBERT HEITMAN, JR., CARROLL E. HOWELL, SYLVESTER W. MEAD, ROBERT F. MILLER, NOEL P. RALSTON.

Bacteriology: COURTLAND S. MUDGE, DONALD M. REYNOLDS.

Botany: WILFRED W. ROBBINS.

Chemistry: HERBERT A. YOUNG, ROBERT K. BRINTON, RICHARD E. KEPNER.

Dairy Industry: EUGENE L. JACK, FRED H. ABBOTT, BRUCE E. HUBBELL, CLEMENT A. PHILLIPS, CHESTER L. ROADHOUSE.

Education: SIDNEY S. SUTHERLAND, FREDERICK L. GRIFFIN.

English: CELESTE TURNER WRIGHT, SOLOMON FISHMAN, BYRON C. GUYER, ELIZABETH R. HOMANN, ELIZABETH A. JASPER, GWENDOLYN B. NEEDHAM, PATRICIA G. SIKES, LINDA VAN NORDEN.

Entomology and Parasitology: STANLEY F. BAILEY, RICHARD M. BOHART, JOHN E. ECKERT, HARRY H. LAIDLAW, WILLIAM H. LANGE, JR.

History: VERNON J. PURYEAR, RICHARD J. MORRISSEY, JAMES H. SHIDELER, CARL B. O'BRIEN.

Irrigation: FRANK J. VEIHMEYER, J. C. MARR, VERNE H. SCOTT.

Landscape Gardening: —————, ERIC C. ARNOLD.

Mathematics: EDWARD B. ROESSLER, HENRY L. ALDER, HUBERT A. ARNOLD, GEORGE A. BAKER, ALBERT C. BURDETTE, CURTIS M. FULTON, CHARLES A. HAYES, KATHRYN B. ROLFE, GEORGE P. STECK.

Military Science: CARL B. BARNES, JOHN S. COLE, BEN W. MESCHER.

Music: LAWRENCE E. McARDELL.

Physical Education: IRVING F. TOOMEY, CARL E. BOYER, THEODORE W. FORBES, VERNARD B. HICKEY, MYRON R. SCHALL, GEORGE A. STROMGREN, MARYA WELCH, EUGENE S. WILSON.

Plant Pathology: JAMES B. KENDRICK, RAYMOND G. GROGAN, JOHN W. OSWALD.

Pomology: WARREN P. TUFTS, RICHARD E. BAKER, LAWRENCE L. CLAYPOOL, CARL J. HANSEN, HUDSON T. HARTMANN, CLARON O. HESSE, EUGENE F. SERR.

Poultry Husbandry: VIGFUS S. ASMUNDSON, F. HOWARD KRATZER, FREDERICK W. LORENZ, WILBOR O. WILSON.

Soil Science: LANNES E. DAVIS, ARTHUR L. BROWN.

Spanish: IVER N. NELSON.

Speech: CELESTE TURNER WRIGHT, SOLOMON FISHMAN, BYRON C. GUYER, ELIZABETH R. HOMANN, GWENDOLYN B. NEEDHAM, PATRICIA G. SIKES, LINDA VAN NORDEN.

Truck Crops: JAMES E. KNOTT, GLEN N. DAVIS, JAMES F. HARRINGTON, PAUL G. SMITH.

Veterinary Science: GEORGE H. HART, THEODORE J. HAGE.

Viticulture: ALBERT J. WINKLER, MAYNARD A. AMERINE, JOHN G. B. CASTOR, JAMES F. GUYMON, H. P. OLMO, W. O. WILLIAMS.

THE TWO-YEAR CURRICULA IN AGRICULTURE AT THE COLLEGE OF AGRICULTURE DAVIS, CALIFORNIA

GENERAL INFORMATION

THE UNIVERSITY OF CALIFORNIA, in its Two-Year Curricula in Agriculture, offers prospective farmers, persons preparing for related vocations, and all others interested in California agriculture a systematic training on a college level in a university atmosphere and a rural environment. Formal scholastic qualifications are not required. This opportunity is intended for both men and women. It is open not only to high school graduates, but to other qualified persons at least eighteen years of age who wish to study agriculture without undertaking a four-year curriculum leading to an academic degree.

The nature of the subject matter covered and of the instructional methods employed is such, however, that only those persons having adequate preliminary practical farm experience, or those otherwise genuinely motivated, can hope to realize the fullest possibilities of the training facilities available. Efficient agricultural production or effective performance in a related technical or semi-professional field is assumed to be the educational objective of every student.

A Certificate of Graduation is awarded those students who meet the requirements as set forth in this bulletin. Although some courses are required of all candidates for graduation, the studies have been grouped into major-subject programs. This grouping facilitates scheduling; it also permits students to pursue definite vocational objectives. Certain prerequisite courses must be taken in the sequence specified in each major-subject program.

Besides the four-year degree curricula and the regular two-year curricula in agriculture offered at Davis, special one- and two-semester programs in applied agriculture are offered for veterans and other adult students. These special programs have no admission requirements, and the usual prerequisite courses may be waived. All special programs, however, must be approved by the Supervisor of the Two-Year Curricula and by the instructors concerned.

THE UNIVERSITY FARM AND THE DAVIS CAMPUS

The Davis campus of the University of California is an integral part of the University Farm, located in Yolo County, 13 miles west of Sacramento, on highways 99W and 40. The Farm now comprises 2,175 acres. The first unit was purchased in 1906, and instruction began two years later. The soil and climate are typical of the great interior valleys of California, and the crops are those grown in most parts of the State. Wells equipped with different types of pumps supply the irrigation water which is distributed over the fields and experimental plots by a modern concrete-pipe irrigation system.

Facilities for Instruction.—The University Farm and the Davis campus have outstanding facilities for practical and technical instruction. Ten modern reinforced concrete buildings house most of the classrooms and student laboratories. For specialized instruction, an apiary, a creamery, a dairy, barns, shops, and greenhouses are maintained. Devices for measuring irrigation water and an up-to-date collection of agricultural tools and implements allow students to become familiar with their operation, maintenance, and uses. Herds and flocks of the principal breeds of cattle, sheep, hogs, horses, and poultry are used for instruction and demonstration in husbandry and judging. Orchards, vineyards, and field plantings offer students practical experience, while adjacent livestock and diversified farms provide additional opportunities for study and judging.

Transportation.—The city of Davis, on the transcontinental line of the Southern Pacific Railroad, is the junction for trains running between the San Francisco Bay cities, way points in northern California, and eastern points. The Pacific Greyhound Lines maintain a bus depot in Davis, with frequent service to Berkeley, Oakland, San Francisco, Sacramento, and other cities.

OFFICE OF VETERANS AFFAIRS

An Office of Veterans Affairs, in charge of a Coördinator of Veterans Affairs, has been established by the University to work out with returning service men and women the many irregularities in their educational programs resulting from war service, to maintain liaison in their behalf with the United States Veterans Administration, and to assist them in becoming assimilated in the life and spirit of the University. This office is situated on the Davis campus in Room 206, Library and Administration Building.

In addition, the United States Veterans Administration maintains an office, in charge of a Training Officer, to assist returning service men and women who are applying for federal educational benefits. This office is located in Room 207, Library and Administration Building.

Information regarding educational benefits available from the State of California may be obtained from the California Veterans Welfare Board, Sacramento 7, California.

Veterans must present an Original or Supplemental Certificate of Eligibility (Veterans Administration Form 7-1950 or 7-1953) and register within the registration period to obtain full veteran benefits. Veterans should apply to their local United States Veterans Administration Office in sufficient time to receive their Certificates of Eligibility prior to registration, or be prepared to pay all expenses (tuition, fees, books, and supplies).

Counseling centers are located on or in the vicinity of each campus. Services of these centers are available to all veterans without cost. The centers offer vocational counseling, which may include aptitude testing and use of the center's library of occupational materials as well as extensive interviewing.

POSITIONS OPEN TO GRADUATES

Most of the graduates and former students in the University Farm School and the later Nondegree and Two-Year Curricula are either managing their own farms or are employed as farm managers and foremen; this situation will probably continue. Many of the older alumni, however, are now engaged in related agricultural vocations.

Close contact with the agricultural industry of the State enables members of the teaching and research staff to anticipate the demands for trained men in the various fields, to meet the changing needs of the industry, and to recommend graduates for employment. Positions of responsibility usually require, besides the regular college courses, one or more seasons of practical training obtained under commercial conditions. Such experience, which often results in business connections leading to permanent employment, may be obtained during summer vacations or through apprenticeship after graduation. Much depends upon the candidate's inherent ability.

Many different vocations have been open to graduates of the Two-Year Curricula in the past, and the demand for trained personnel still continues. Positions that pay adequate wages and permit advancement are often available for assistant buttermakers, cheesemakers, ice-cream makers, milk testers, and assistant technicians in commercial dairy-manufacturing and distribution plants; herdsmen; advanced registry testers; skilled poultry and apiary workers; horticultural and dairy inspectors; field agents in the fruit-and-vegetable standardization and shipping-point inspection services; deputy county agricultural commissioners; caretakers of private estates; foremen of public parks, landscape contractors, nurserymen, and florists; field men, salesmen, and skilled workers for seedsmen; weed- and rodent-control specialists; workers skilled in controlling insect and other household and farmstead pests; plant- and disease-control specialists and contractors; and foremen of water delivery for irrigation districts and large farm enterprises. The rapidly expanding field of food preservation (canning, dehydration, and freezing storage) offers new opportunities to graduates in truck crops and horticulture.

PRACTICAL FARM EXPERIENCE

Many of the courses in animal and plant production can be undertaken most advantageously by students with a background of farm experience. There is opportunity to obtain practical training on the University Farm, but those interested must seek it on their own initiative, since no formal farm-practice courses are offered. As a rule, such desirable experience can be most easily and efficiently obtained on commercial farms during the precollege years, during the summer vacation period, or by an intensive apprenticeship after the college courses have been completed. The College of Agriculture, coöperating with farmers in certain areas, provides work experience for those worthy students who are more interested in the educational opportunities than in financial rewards.

GENERAL REGULATIONS

CLASSIFICATION OF STUDENTS

FOR ADMINISTRATIVE PURPOSES, students at Davis are classified into four groups on the basis of their academic preparation or their educational objective:

Group I. *Four-year students seeking the bachelor's degree.* All students who have fulfilled the entrance requirements of the University and are pursuing courses leading to the bachelor's degree are given this classification.

Group II. *Students with matriculation deficiencies who wish to qualify for regular standing in the University of California.* This group includes high school graduates who have minor matriculation deficiencies. For further information concerning this classification, see the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

Group III. *Students in the Two-Year Curricula in Agriculture.* High school graduates and qualified persons more than 18 years of age who are not high school graduates but who are registered for a two-year major-subject program leading to the Certificate of Graduation are placed in this group. Students enrolled for a special one-semester, a one-year, or a general two-year program which does not lead to graduation are also classified in this group.

Group IV. *Special degree students.* Students in this classification are mature persons who have not had the opportunity to complete a satisfactory high school program, but who because of their previous training and experience may profit by the special opportunities afforded in the degree curricula. Credit so received may be counted toward the bachelor's degree if other graduation requirements are met.

Visitors.—Students who can remain in residence only a few weeks may register as visitors and be granted special privileges for a brief period of intensive study with some member of the staff. Visitors pay a fee of \$3 for the first week and \$2 for each additional week of residence, the full amount payable in advance. This is a special privilege accorded persons of maturity with very definite objectives. Each must have his application approved by the Assistant Dean and endorsed by the staff member under whom he wishes to study. Except for conduct, visitors are not held for the same academic regulations as are regular students. They may have full use of the Library, but are not entitled to the facilities of the Student Health Service.

ADMISSION AND REGISTRATION

Requirements for Admission.—Admission to the Two-Year Curricula is granted any qualified person who has a high school diploma or who, if not a high school graduate, is at least 18 years of age. Application blanks may be obtained from the Recorder, College of Agriculture, University of California, Davis. Every applicant for admission is required to pay a fee of \$5 when the first application is filed.* Remittance by bank draft or money order should be

* Veterans who expect to enroll under the provisions of Public Law 346 or Public Law 16 are not required to remit this fee at the time of application; if the applicant is accepted and registers in the University, the fee will be paid by the government.

made payable to The Regents of the University of California. With the application for admission there must be filed a certificate showing successful vaccination against smallpox within the last seven years. A form for this purpose will be furnished by the University. Credentials from schools beyond the eighth grade should be submitted at the time of application.

Prospective students who are not graduates of a high school, whose high school academic record is less than average, or who have little or no practical farm or related vocational experience, must make application *in person* and be interviewed by the Supervisor of the Two-Year Curricula, or his representative. Such personal application should be made at least 30 days prior to the opening of any regular semester.

Registration.—The prospective student should plan to arrive at Davis by Monday of registration week. Formal registration should be completed by Friday afternoon. All new students and those returning after an absence may be required to take certain tests at specified hours on Tuesday.

Late Admission and Registration.—The prospective student should consult the University calendar for the dates upon which he is expected to register and to begin his work. Failure to register upon the prescribed days will cause difficulty in the making of a satisfactory program and will retard the progress both of the student himself and of each class in which he enrolls. A fee of \$2 is charged for late registration; this fee applies both to old and new students.

A qualified student or applicant who fails to register upon the stated registration days at the opening of the semester, but who, nevertheless, appears *during the first two weeks of instruction*, will in general be permitted to enter. After the first week, however, he must obtain the written approval of all the instructors in charge of his proposed courses and of the Assistant Dean before his registration can be completed.

Late Admission from Other Institutions.—A student in another college or university who desires to enter the University of California after stated registration days should, without fail, communicate in advance with the Recorder. Then, before discontinuing his studies elsewhere, he should await assurance that late admission will be permitted. Such permission to register after the prescribed dates requires the approval of both the Recorder and the Assistant Dean.

FEEES

Tuition Fee.—Tuition is free to residents of California. The student classed as a nonresident pays a tuition fee of \$150 a semester. (See the GENERAL CATALOGUE, Berkeley or Los Angeles, for regulations concerning this fee.)

Incidental Fee.—The incidental fee at Davis is \$42.50 each semester. This fee, which must be paid at the time of registration, covers certain expenses for library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, for registration and graduation, for laboratory and course fees, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service. No

part of this fee is remitted to the student who does not wish to make use of these privileges.

The incidental fee at Davis also includes the student-body membership fee. Membership privileges include participation in student affairs, a free subscription to the student newspaper, and free admission to many athletic contests and reduced admission rates to others.

Refunds.—For students who leave before the end of any semester, part of the fees may be refunded. A schedule of refunds and other information will be found in a separate circular concerning student fees and deposits, which may be obtained from the Recorder.

MEDICAL AND PHYSICAL EXAMINATION

All new students, just after filing their registration papers, must appear before the University Medical Examiners and pass a medical and physical examination so that the health of both the community and individual may be safeguarded. Every new student must include with his application for admission a certificate testifying to successful vaccination against smallpox within the last seven years. Tests for tuberculosis are given to all new students. Applicants for admission who have contagious diseases will be excluded. Those having physical conditions, such as convulsive seizures, which grossly disturb the classwork of other students should not apply for admission.

Before going to Davis, every student is urged to have his own physician examine him for fitness to carry on University work. All defects capable of remedial treatment, such as diseased tonsils or imperfect eyesight, should be corrected to prevent possible loss of time from studies.

ADVISERS

Each student is assigned a faculty adviser upon admission to the University. The adviser will assist in planning the program, but this help does not relieve the student of the responsibility for satisfying graduation requirements.

STUDY-LIST REGULATIONS

At the beginning of each semester every student is required to file, upon a date to be fixed by the Recorder, a detailed study list bearing the approval of his faculty adviser.

The presentation of the study list and its acceptance by the College are evidence of the student's obligation to perform the designated work. Withdrawal from, or neglect of, any course entered on the study list, or a change in program without the formal permission of the Assistant Dean, makes the student liable to enforced withdrawal from the University, or to other disciplinary action.

Authority of Instructors.—No student will be permitted to undertake any college course if, in the instructor's opinion, he lacks the necessary preparation to insure competent work.

Every student is required to satisfy the instructor in each of his courses. Instructors will report to the Assistant Dean from time to time the names of students whose attendance or work is unsatisfactory.

Any instructor, with the approval of the Assistant Dean, may at any time exclude from his course any student guilty of unbecoming conduct toward the instructor or any member of the class, or any student who, in his judgment, has neglected the work. Such a student will be recorded as having failed in the course, unless the Faculty determines otherwise.

MILITARY SCIENCE AND TACTICS

All male students who are citizens of the United States, able-bodied, and under 23 years of age at the time of their initial enrollment in the University, must satisfactorily complete four semesters of military science and tactics.

A student claiming exemption because of noncitizenship, physical disability, age, or military service will present to the Recorder a petition for such exemption on the prescribed form within two weeks of the date of registration. Exception will be made where illness or physical disability occurs after that date.

If a student subject to this requirement fails to appear for work in the course, he is subject to dismissal from the University.

The course in the training of infantry is that prescribed by the Department of the Army for corresponding units of the senior division of the Reserve Officers' Training Corps. The United States Government furnishes arms, equipment, uniforms, and textbooks for the use of students belonging to such units.

The mission of the Senior Division R.O.T.C. is to produce junior officers who have the qualities and attributes essential to their progressive and continued development as officers in a component of the Army of the United States.

Students who complete the advanced course, and who participate in such summer camps as the Secretary of the Army may prescribe, are eligible upon graduation for appointment and commission by the President in the Officers' Reserve Corps. Students who complete the advanced course are also eligible to be commissioned by the Governor of the State of California in the University Cadets. These courses are open only to physically qualified students who are citizens of the United States.

CANDIDACY FOR GRADUATION

Every student who intends to become a candidate for a Certificate of Graduation must file, on a date to be fixed by the Recorder, an Announcement of Candidacy. For filing later than the appointed date, a fee of \$2 is charged.

All candidates for graduation must be enrolled in the Two-Year Curricula throughout the final semester of residence. All graduates of any one calendar year are considered as belonging to the "class" of that year.

CHANGE OF MAJOR-SUBJECT CURRICULUM

A student may transfer from one major-subject curriculum to another, provided a petition, approved by the advisers concerned, is filed with the Recorder.

GRADES OF SCHOLARSHIP AND GRADE POINTS

The result of the student's work in each course, including courses in which credit is sought by examination, is reported to the Recorder in one of six scholarship grades, four of which are passing, as follows: A, excellent; B, good; C, fair; D, barely passing; E and F, not passing. Grades are not otherwise defined, as, for example, by percentages, or by a rule stipulating the manner in which the several grades shall be distributed.

Grade E (not passed) indicates a record below passing, but the student may raise an E (without repetition of the course) by passing a further examination or by performing other tasks required by the instructor. Grade F (not passed) denotes a record so poor that it may be raised to a passing grade only by repeating the course.

The term "incomplete" is not used. The instructor must assign for every student a definite grade based upon the work accomplished, irrespective of the circumstances which may have contributed to the results achieved.

Course reports filed by instructors at the end of each semester are final, not provisional.

Grade points are assigned to the respective scholarship grades as follows: for each unit of credit, the scholarship grade A is assigned 3 points; B, 2 points; C, 1 point; D, E, and F, no points.

In order to qualify for the Certificate of Graduation, the student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him.

MINIMUM SCHOLARSHIP REQUIREMENTS

A student is expected to maintain at all times a grade-point average of one (a C average) or better. If his average falls below this minimum, he may be subject to the provisions of *probation* or *dismissal*.

Probation.—A student will be placed on probation:

(1) If at the close of his first semester his record shows a total deficiency of six or more grade points; or

(2) If at the close of any subsequent semester his grade-point average is less than one (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

Dismissal.—A student will be subject to dismissal from the University:

(1) If during any semester he fails to pass with a grade of C or higher courses totaling at least 4 units; or

(2) If while on probation his grade-point average for the work undertaken during any semester falls below one (a C average); or

(3) If after two semesters of probationary status he has not obtained a grade-point average of one (a C average), computed on the total of all courses undertaken in this University for which he has received a final report; or

(4) If at any time during a semester the reports of progress of his scholastic work are such as to indicate his inability or unwillingness to profit by the instruction for which he is enrolled.

A student who becomes subject to the provisions of these regulations will also be subject to Faculty supervision. The Faculty may dismiss him from the University or may permit him to remain there on probation, or to return later. Any student who receives a notice of dismissal may petition the Assistant Dean for a hearing. Ordinarily, however, students dismissed for unsatisfactory scholarship will not be permitted to return.

ADVANCED STANDING

Candidates for graduation from the Two-Year Curricula will receive credit for equivalent courses completed with a grade of C or higher in junior colleges or other institutions of collegiate rank. In every instance, however, one year of residence and the completion of a major-subject curriculum or its equivalent as determined by the major-subject adviser is required for the Certificate of Graduation.

CREDIT BY EXAMINATION

Under certain conditions, a student in residence and in good standing may take examinations for credit either (a) in courses offered in the University, without formal enrollment in them, or (b) in subjects appropriate to his curriculum, but not offered as courses by the University. The results of all such examinations, with grades and grade points, are entered upon the student's record in the same manner as for regular courses of instruction (see Grades of Scholarship and Grade Points, page 18). No fees are required.

The privilege of taking an examination for credit will ordinarily be granted only to students who have at least a B average for all courses undertaken in the University.

These examinations must be arranged in advance with the Assistant Dean; his approval and that of the instructor in charge are necessary.

The application form for examinations may be obtained from the Recorder.

EXTRA-SESSION WORK

Two-Year students who have completed at least one semester in residence may, with the approval of the instructor, the head of the subject-matter division, and the Supervisor of the Two-Year Curricula, undertake extra-session work. Under this plan, credit toward the Certificate of Graduation is given for a special problem, dealing with the laboratory or field phases of a subject and pursued during the Christmas recess or the summer vacation period, provided the four following regulations are complied with:

- (1) The problem shall require 1 to 8 weeks' effort of 8 hours a day, 5 days a week.
- (2) The student receives no remuneration for his work, other than board and room.
- (3) The credit granted shall not exceed 1 unit for each week of study.
- (4) The student enrolls with the Recorder, College of Agriculture, Davis, before beginning the work.

REMOVAL OF DEFICIENCIES

A student who receives a grade lower than C in a course may, upon repeating the course, receive the grade assigned by the instructor, with the appropriate grade points.

For the purpose of raising grade E to a passing grade the student may, with the consent of the instructor concerned and of the Assistant Dean, take a "condition examination." Any examination, term paper, or other exercise required in order to raise the grade E to a passing grade in a course is a "condition examination." Before every such examination a formal permit, obtained from the Recorder, must be shown; otherwise the instructor will lack authority to consider and report upon work submitted by the student. For every course in which a special examination is undertaken with a view to raising grade E to a passing grade, \$2 is charged. The fee for a permit for two or more special examinations of this type is \$3. There is no fee if a final examination taken with the class is the only task required by the instructor for raising an E to a passing grade, and if this final examination is taken not later than the close of the next succeeding semester of the student's residence in which the course is offered. A petition for a special examination or for admission to an examination with a class may be obtained from the Recorder. In a course in which the final examination is regularly held, a student can raise an E to a passing grade only by passing a satisfactory final examination.

If a student who has received an E in any course fails to raise it to a passing grade by the end of the next semester of his residence in which the course is regularly given, then the grade shall be changed to F. If meanwhile, however, the student has repeated the course and has again received an E, his grade will remain E, as if he were taking the course for the first time. If a student fails to attain a grade D or a higher grade in any course after a re-examination for the purpose of raising an E, he will be recorded as having received an F in the course.

LEAVE OF ABSENCE AND HONORABLE DISMISSAL

A brief leave of absence, to expire on a definite date, may be issued to a student in good standing who finds it necessary to withdraw for a short time, but who wishes to retain his status and to resume his work before the close of the current semester. No excuse for absence will relieve him of the necessity of completing each course to the satisfaction of the instructor. Petition forms for

leaves of absence, with complete instructions, may be obtained from the Recorder.

For leave to be absent from any college exercise other than a final examination, a student must apply to the instructor in charge of the exercise. If, for an unavoidable cause, he is obliged to miss all college exercises for several days, he should apply for a brief leave of absence as directed above. Leave to be absent from final examinations must be sought by written petition to the appropriate faculty.

An honorable dismissal or an indefinite leave of absence may, upon petition, be issued to any student in good standing, provided he complies with the instructions obtained from the Recorder.

A student is in good standing if he is entitled to enjoy his normal privileges. Students dismissed for scholarship deficiencies, students on probation, students under censure, and students under suspension are not in good standing.

Students who discontinue their work without formal leave of absence risk having their registration privileges curtailed or withdrawn.

DISCIPLINE

When a student enters the University, the authorities assume that he has an earnest purpose. If, however, he becomes guilty of unbecoming behavior or neglects his academic duties, the University authorities will take such action as the offense seems to require. Students who fail to use the opportunities freely given to them by the University must expect to have their privileges curtailed or withdrawn.

Degrees of Discipline.—There are five degrees of discipline: warning, censure, suspension, dismissal, and expulsion. "Censure" indicates that the student is in danger of exclusion from the University. "Suspension" is exclusion for a definite period. "Dismissal" is exclusion for an indefinite period; the student's connection with the University will presumably be ended by it. "Expulsion" is the most severe academic penalty, and represents final exclusion.

In respect to disciplinary action based on recommendations of the Welfare Council, the term "full censure" is sometimes used. "Full censure" carries with it suspension from student activities, while "censure" does not.



BEEF CATTLE PRODUCTION LABORATORY

MISCELLANEOUS INFORMATION

LIVING ACCOMMODATIONS AND EXPENSES

THE UNIVERSITY MAINTAINS at Davis residence halls for men and women, a dining hall, and emergency housing apartments for married veterans. Board and room in the residence halls cost approximately \$235 a semester. The price is about the same in private homes in the city of Davis and in the various fraternities and clubhouses.

Rooms in the residence halls contain necessary furniture, linen, and blankets; the rent includes the weekly laundering of linen. For further information write to the Office of the Comptroller, College of Agriculture, Davis, California.

All women students under 21 years of age are required at the time of registration to have their college residence approved by the Adviser to Women. This approval is given to women students living with their parents, or in the College residence halls, or in houses approved by the University.

OPPORTUNITIES FOR PART-TIME EMPLOYMENT

A self-supporting student has many opportunities for employment. If diligent, he may spend 12 to 25 hours a week in outside employment while undertaking a study program of from 12 to 16 units, which requires 36 to 48 hours of work a week. He should bear in mind, however, that not every kind or amount of outside work is compatible with his main purpose—namely, his education. In the main, students engaging in many hours of outside employment must forego participation in extra-curricular activities.

Only rarely can a student be entirely self-supporting. No student who intends to support himself should enter the University without sufficient funds to meet the expenses of the first semester.

The State Labor Code of California prohibits the employment of an alien by any department of the State. In conformity with this law, no alien student may be employed by the University.

Students seeking employment should apply to the Office of the Comptroller.

LOANS

Several loan funds have been established for students of agriculture. They include the Thomas Forsyth Hunt Memorial Loan Fund, the Emergency Loan Fund, the University Farm Circle Loan Fund, and the Aggie Alumni Loan Fund. Applications should be made to the Supervisor of Student Affairs.

STUDENT HEALTH SERVICE

The Student Health Service aims to conserve the students' time for classwork and studies, by preventing and treating acute illnesses.

Each registered student at Davis may, if needed, have consultations and medical care at the Student Health Center from the time of payment of his registration fee to the last day of the current semester. Certain care and con-

sultation, when directed by the University Physician, may be had at the Woodland Clinic Hospital. Surgical treatment is included when, in the opinion of the University Physician, it is necessary and falls within the limitations herein outlined. During the semester, hospital care up to thirty days may be given in serious illness on the recommendation of the University Physician.

If an illness requires long-continued care, so that the student may not be returned to classes during the current semester, or if at the end of the semester he is still ill, he will be released to his home or community as soon as the University Physician considers it safe. Additional charges will be made for unusual appliances or remedies not ordinarily available or for hospitalization in excess of thirty days.

The Student Health Service does not take responsibility for certain chronic physical defects or illnesses present at the time of entrance to the University (for example, hernias, chronic bone and joint diseases or deformities, chronic gastrointestinal disorders, fibroids of the uterus, chronically infected tonsils, tuberculosis, syphilis, malignant diseases, and allergic and endocrine disorders). Furthermore, it does not take responsibility for any injury or illness wherein treatment has been initiated elsewhere, with the exception of first aid and emergency care. It does not take responsibility for remedial defects where medical or surgical treatment is elective and not of an emergency nature, and where the best interests of the student will be served by treatment during vacation.

Dental service for diagnosis and emergencies (such as fractures) is provided.

LIBRARY FACILITIES

The University Library on the Davis campus contains about 61,000 volumes, and currently receives 1,200 periodicals. These have been selected for the needs of research and teaching in the field of agriculture and related sciences. Notable collections are those of apiculture, viticulture, and agronomy. The herdbooks for California-grown livestock breeds are consulted widely.

The main library is for the use of all students and staff. Small, specialized departmental collections are limited to the use of faculty and graduate students during office hours. Borrowers' regulations and responsibilities are practically the same for both Berkeley and Davis libraries. Students on either campus may have library-use privileges on the other campus. Faculty of both campuses have exchange privileges, with similar regulations.

For the needs of research, library holdings are augmented by Inter-library Loan with the Berkeley Library and some thirty other libraries. The State Library, with its network of cooperative county and city libraries, is of great value in supplying occasional requests of a more popular nature.

STUDENT ACTIVITIES

On the Davis campus many forms of activity are maintained. Every "Aggie" is a member of the Associated Students, which governs all student affairs.

Publications include *El Rodeo*, a yearbook, and the *California Aggie*, a weekly newspaper.

There is opportunity to participate in many forms of athletics. The California Aggies are members of the Far Western Conference and stress both intercollegiate and intramural athletics. The major sports include football, basketball, boxing, track, and baseball; the minor sports are tennis, wrestling, golf, riding, swimming, and skiing.

The Associated Students support other activities as well—band, orchestra, chorus, debating, dramatics, radio broadcasting, and rifle team. The California Club, emphasizing the unity of student life on all campuses of the University, is active.

Many organizations sponsor the development of special interests at Davis. The Blue and Gold Dairy Club, the Golden Hoof Club, the Horticultural Round Table, the Home Economics Club, the Senior 4-H Club, and the Gilmore Collegiate Chapter of the Future Farmers of America meet regularly to hear outstanding speakers and to enjoy social contacts. The Music Association encourages the further use of talents; the Women's Association includes all women students on campus; the International Forum promotes friendly relations between foreign-born and native students and discusses world problems.

THE TWO-YEAR CURRICULA AND MAJOR-SUBJECT PROGRAMS

GRADUATION

Requirements for the Certificate of Graduation.—Students completing the following requirements in the Two-Year Curricula in Agriculture will be awarded the Certificate of Graduation by the University of California:

1. A minimum of 64 units of credit (of which at least 32 units and the last semester must be completed in residence in the Two-Year Curricula), and at least as many grade points as credit units in all courses undertaken in the Two-Year Curricula.

2. The specified courses in American History and Institutions (History 57A or 57B), English (English 50), and Mathematics (Mathematics 50), or their equivalents, and in Military Science.

3. One of the major-subject curricula described in the following pages, or its equivalent as determined by the major-subject adviser.

Graduation with Honors.—Every Two-Year Curricula student who completes at least two semesters in the Two-Year Curricula with a grade-point average of 2.5 or better is awarded a special Honor Certificate at the time of graduation.

ANIMAL-PRODUCTION CURRICULA

ANIMAL HUSBANDRY

The two-year program in animal husbandry is for students primarily interested in horses, dairy cattle, beef cattle, hogs, sheep, or other domestic animals.

The courses listed below, with the exception of those with an asterisk (*), which are electives from which the student must select 4 units, are required of all students whose major is animal husbandry.

The courses in animal husbandry are described on page 37.

First Year

FALL SEMESTER	Units	* SPRING SEMESTER	Units
<i>Course</i>		<i>Course</i>	
An. Biol. 51A. Animal Biology	3	Agron. 54. Forage Crops	3
An. Husb. 51. Principles of Animal Husbandry	4	An. Biol. 51B. Animal Biology	3
Chem. 50. Elementary Chemistry	3	An. Husb. 52. Feeds and Feeding	3
Math. 50. Elementary Mathematics	3	Engl. 50. Business Writing	3
Military Science	2	Military Science	2
		Elective	3
	15		17

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
*An. Husb. 61. Swine Production . . .	2	*An. Husb. 56. Horse Production . . .	2
*An. Husb. 63. Beef Cattle Production . . .	2	*An. Husb. 58. Milk Production . . .	2
†Bact. 61. Elementary Bacteriology . . .	2	*An. Husb. 64. Sheep Production . . .	2
Hist. 57A. History and Institutions of the United States . . .	3	Military Science . . .	2
Military Science . . .	2	Soil Sci. 52. Soils . . .	3
‡Elective . . .	5	‡Elective . . .	5
	16		16

Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 51. Weed Control . . .	3	Agr. Econ. 54. Farm Management . . .	3
Irrig. 53. Irrigation Practice . . .	3	Agr. Engin. 52. Farm Structures . . .	3
Poult. Husb. 51. Elementary Poultry Production . . .	3	Agr. Engin. 54. Farm Machinery . . .	3
Vet. Sci. 51. Animal Hygiene . . .	2	Speech 50. Elements of Public Speaking . . .	3

DAIRY HUSBANDRY

The two-year program in dairy husbandry is designed for students primarily interested in dairy farming.

The courses listed below are required of all students whose major is dairy husbandry.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
An. Biol. 51A. Animal Biology . . .	3	An. Biol. 51B. Animal Biology . . .	3
Chem. 50. Elementary Chemistry . . .	3	An. Husb. 52. Feeds and Feeding . . .	2
Dairy Ind. 50. Elements of Dairying . . .	3	Dairy Ind. 54. Market Milk . . .	3
Math. 50. Elementary Mathematics . . .	3	Engl. 50. Business Writing . . .	3
Military Science . . .	2	Military Science . . .	2
Elective . . .	3	Elective . . .	3
	17		17

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 57. Dairy Mechanics and Refrigeration . . .	3	Agr. Engin. 52. Farm Structures . . .	3
Bact. 61. Elementary Bacteriology . . .	2	Agron. 54. Forage Crops . . .	3
Hist. 57A. History and Institutions of the United States . . .	3	An. Husb. 58. Milk Production . . .	2
Military Science . . .	2	Military Science . . .	2
Elective . . .	5	Soil Sci. 52. Soils . . .	3
	15	Elective . . .	3
			16

* Choice of production courses depends upon student's interests.

† Botany 50 or Entomology 51 may be substituted for bacteriology.

‡ Five units of agricultural engineering are required.

Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Econ. 54. Farm Management..	3
Agr. Engin. 50. Farm Mechanics...	3	Agr. Engin. 54. Farm Machinery..	3
Agr. Engin. 55. Farm Power.....	3	Irrig. 52. Plane Surveying.....	3
An. Husb. 51. Principles of Animal Husbandry	4		
An. Husb. 61. Swine Production...	2		
Irrig. 53. Irrigation Practice.....	3		
Poult. Husb. 51. Elementary Poultry Production	3		
Vet. Sci. 51. Animal Hygiene.....	2		

POULTRY HUSBANDRY

The two-year program in poultry husbandry is designed to give a general working knowledge of poultry production. The more specialized courses, together with special problems (Poultry Husbandry 90), provide the additional instruction needed by those who expect to engage in some phase of the industry. The phases of the poultry industry for which the student may prepare are commercial egg production, poultry breeding, hatchery operation, feed sales and service work, turkey production, or game-bird propagation.

The courses in poultry husbandry are described on pages 48 and 49.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
An. Biol. 51A. Animal Biology.....	3	Agr. Engin. 50. Farm Mechanics...	3
Chem. 50. Elementary Chemistry...	3	An. Biol. 51B. Animal Biology.....	3
Math. 50. Elementary Mathematics.	3	Engl. 50. Business Writing.....	3
Military Science	2	Military Science	2
Poult. Husb. 51. Elementary Poultry Production	3	Poult. Husb. 52. Principles of Poultry Husbandry	3
Elective	2	Elective	2
	<hr/> 16		<hr/> 16

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bact. 61. Elementary Bacteriology..	2	*Agr. Econ. 54. Farm Management..	3
Military Science	2	Agr. Engin. 52. Farm Structures...	3
Poult. Husb. 55. Utility Poultry Breeding	2	Agron. 52. Cereals.....	3
Poult. Husb. 57. Poultry Nutrition..	2	Hist. 57B. History and Institutions of the United States.....	3
*Poult. Husb. 59. Market Eggs and Poultry	2	Military Science	2
Vet. Sci. 51. Animal Hygiene.....	2	Poult. Husb. 56. Turkey Production	2
†Elective	3	‡Elective	2
	<hr/> 15		<hr/> 18

DAIRY-INDUSTRY CURRICULUM

The two-year program in dairy industry is primarily concerned with the handling of milk and the manufacture of dairy products. The courses are de-

* Recommended elective.

† Poultry Husbandry 53, Incubation and Brooding Practice (3 units), may be elected with the consent of the instructor.

‡ Poultry Husbandry 54, Pen Practice (2 units), may be elected with the consent of the instructor.

signed for persons who wish to qualify as buttermakers, cheesemakers, ice-cream makers, milk-plant workers, laboratory workers, and dairy inspectors.

The courses in dairy industry are listed on pages 38 and 39.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 50. Farm Mechanics . . .	3	*An. Biol. 51B. Animal Biology . . .	3
*An. Biol. 51A. Animal Biology . . .	3	*An. Husb. 52. Feeds and Feeding . . .	3
Dairy Ind. 50. Elements of Dairying	3	Chem. 50. Elementary Chemistry . . .	3
Engl. 50. Business Writing	3	Dairy Ind. 54. Market Milk	3
Math. 50. Elementary Mathematics .	3	Dairy Ind. 60. Creamery Practice . .	3
Military Science	2	Military Science	2
	17		17

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 57. Dairy Mechanics and Refrigeration	3	*Agr. Engin. 52. Farm Structures . .	3
Bact. 61. Elementary Bacteriology . .	2	*An. Husb. 58. Milk Production . . .	2
Dairy Ind. 51. Cheesemaking	3	Dairy Ind. 52. Buttermaking	3
Dairy Ind. 53. Ice-Cream Making . . .	3	Dairy Ind. 62. Dairy Plant Management	3
Hist. 57A. History and Institutions of the United States	3	Military Science	2
Military Science	2	*Speech 50. Elements of Public Speaking	3
	16		16

PLANT-PRODUCTION CURRICULA

AGRONOMY

The two-year program in agronomy, as outlined below, has been formulated for students planning to engage in general farming or in special work that involves grading, standardization, and inspection of the control of noxious weeds, insect pests, and plant diseases of field crops. The courses listed are required of all students whose major is agronomy.

By changing the sequence of certain courses, a student may include, besides the required work in agronomy, additional units in agricultural engineering, animal husbandry, or truck crops.

The courses in agronomy are described on page 36.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agron. 51. Introduction to Agronomy	3	Agr. Engin. 54. Farm Machinery . . .	3
Bot. 50. Elementary Botany	3	Agron. 52. Cereals	3
Irrig. 53. Irrigation Practice	3	Engl. 50. Business Writing	3
Math. 50. Elementary Mathematics .	3	Hist. 57B. History and Institutions of the United States	3
Military Science	2	Hort. 50. Fruit Growing	3
Tr. Crops 51. Truck Crops	3	Military Science	2
	17		17

* Recommended elective.

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 55. Farm Power.....	3	Agron. 54. Forage Crops.....	3
Agron. 53. Miscellaneous Field Crops	3	Military Science.....	2
Bot. 51. Weed Control.....	3	Pl. Path. 52. Plant Diseases.....	3
Entom. 51. Entomological Practice..	3	Soil Sci. 52. Soils.....	3
Military Science.....	2	Elective.....	6
Elective.....	3		
	17		17

HORTICULTURE

The two-year program in horticulture deals with the production of temperate zone tree fruits, berries, and grapes under California conditions and with certain phases of their utilization. Field and laboratory facilities and classroom instruction are provided to give opportunity for a critical study of the establishment of new orchards and vineyards; pruning and training of trees and vines; cultivation, irrigation, and fertilization of orchards and vineyards; varieties; harvesting and packing of fruit for fresh shipment; inspection and marketing of fruits; drying of raisins, prunes, peaches, apricots, and pears; and production of wines and related products. The program is designed as basic training for students who plan to operate and manage their own orchards, vineyards, or wineries; to be orchard and vineyard foremen, managers, or superintendents; or to work in the inspection and standardization of horticultural products.

Students who plan to complete the two-year program may take the maximum number of courses offered, and will have least difficulty in arranging schedules if the following courses are taken in the sequence suggested below. Those entering in the spring semester may arrange a similar sequence of courses with the aid of their advisers. Spring entrants may, however, experience difficulty in completing the work in four semesters.

The courses in horticulture are described on pages 42 and 43.

The following sequence of courses is advised for students specializing in tree fruits and grapes.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 50. Elementary Botany.....	3	Engl. 50. Business Writing.....	3
Hort. 50. Fruit Growing.....	3	Hist. 57B. History and Institutions of the United States.....	3
Hort. 53. Orchard Operations.....	2	Hort. 54. Orchard Operations.....	2
Math. 50. Elementary Mathematics..	3	Military Science.....	2
Military Science.....	2	Soil Sci. 52. Soils.....	3
Elective.....	3	Elective.....	3
	16		16

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Entom. 51. Entomological Practice..	3	Hort. 52. Plant Propagation.....	2
Irrig. 53. Irrigation Practice.....	3	Military Science	2
Military Science	2	Pl. Path. 52. Plant Diseases.....	3
Elective	8	Elective	9
	16		16

At least 12 units of horticultural subjects and 6 units of agricultural engineering must be included.

Students especially interested in grape growing may substitute Horticulture 61 for Horticulture 53, and Horticulture 62 for Horticulture 54 or Horticulture 52.

Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products	3	Agr. Econ. 54. Farm Management..	3
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Engin. 50. Farm Mechanics... 3	
Agr. Engin. 50. Farm Mechanics... 3		Agr. Engin. 52. Farm Structures... 3	
Agr. Engin. 55. Farm Power..... 3		Agr. Engin. 54. Farm Machinery... 3	
Agron. 51. Introduction to Agronomy 3		Agron. 52. Cereals	3
Bot. 51. Weed Control..... 3		Agron. 54. Forage Crops..... 3	
Hort. 59. Citrus and Other Subtropical Fruits	3	Educ. 62. The Agricultural Code... 3	
Hort. 61. Viticulture	3	Entom. 52. Beekeeping	3
Lands. Gard. 50. General Landscape Gardening	4	Hort. 62. Vineyard Operations.... 3	
Tr. Crops 51. Truck Crops..... 3			

The following sequence of courses is advised for students specializing in practical enology.*

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 50. Elementary Botany	3	Agr. Engin. 50. Farm Mechanics... 3	
Chem. 50. Elementary Chemistry... 3		Engl. 50. Business Writing	3
Hort. 50. Fruit Growing	3	Hist. 57B. History and Institutions of the United States	3
Hort. 61. Viticulture	3	Military Science	2
Math. 50. Elementary Mathematics. 3		Soil Sci. 52. Soils	3
Military Science	2	Elective	2
	17		16

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 57. Dairy Mechanics and Refrigeration	3	Hort. 62. Vineyard Operations.... 3	
Bact. 61. Elementary Bacteriology.. 2		Hort. 64. Enology	3
Hort. 63. Enology	3	Military Science	2
Irrig. 53. Irrigation Practice	3	Pl. Path. 52. Plant Diseases..... 3	
Military Science	2	Elective	5
Elective	4		
	17		16

* Students professionally interested in enology should qualify for the degree program in order to secure sufficient background to profit by the courses in enology.

LANDSCAPE GARDENING

The two-year program in landscape gardening is designed to prepare men and women for the practical business of landscape gardening and contracting (executing the plans and specifications of landscape architects); for the managements of private estates; for ornamental nursery work; for commercial floriculture; and for the development of urban homes and rural farmsteads.

This work is not designed to prepare persons for professional practice of landscape architecture, since five or more years of university training are essential for such work.

Students with previous training or experience may elect, with the instructor's consent, courses sufficient to make up a special one-year program. The courses in landscape gardening are described on pages 44 and 45.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 50. Elementary Botany.....	3	Hist. 57B. History and Institutions of the United States.....	3
Engl. 50. Business Writing.....	3	Lands. Gard. 56. Advanced Floriculture.....	2
Lands. Gard. 50. General Landscape Gardening.....	4	Lands. Gard. 60. Advanced Plant Materials.....	2
Lands. Gard. 55. Floriculture.....	2	Military Science.....	2
Math. 50. Elementary Mathematics.	3	Soil Sci. 52. Soils.....	3
Military Science.....	2	Speech 50. Elements of Public Speaking.....	3
		Elective.....	2
	17		17

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 51. Weed Control.....	3	Hort. 52. Plant Propagation.....	2
Entom. 51. Entomological Practice..	3	Lands. Gard. 54. Advanced Nursery Practice.....	2
Lands. Gard. 53. Nursery Practice..	2	Military Science.....	2
Lands. Gard. 57. Tree Care.....	2	Pl. Path. 52. Plant Diseases.....	3
Military Science.....	2	Elective.....	7
Elective.....	4		
	16		16

Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products.....	3	Agr. Engin. 50. Farm Mechanics... 3	3
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Engin. 52. Farm Structures... 3	3
Agr. Engin. 50. Farm Mechanics... 3	3	Educ. 62. The Agricultural Code... 3	3
Agr. Engin. 51. Drawing.....	2	Hort. 50. Fruit Growing.....	3
Irrig. 53. Irrigation Practice.....	3	Lands. Gard. 90. Special Problems..	2-6
		Tr. Crops 52. Vegetable Improvement	3

TRUCK CROPS

The two-year program in truck crops is designed to give a general understanding of the subject. Advanced courses are planned primarily for students especially interested. A course in seed growing and in methods of improving vegetable varieties is offered for those who may become connected with the

seed-growing industry. Truck-crops majors may undertake a special program in vegetable production. The division is well equipped with land and with packing-shed, greenhouses, and coldframe facilities, as well as a large field laboratory.

The courses in truck crops are described on page 50.

First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agron. 51. Introduction to Agronomy	3	Engl. 50. Business Writing	3
Bot. 50. Elementary Botany	3	Hist. 57B. History and Institutions of the United States	3
Irrig. 53. Irrigation Practice	3	Hort. 50. Fruit Growing	3
Math. 50. Elementary Mathematics	3	Military Science	2
Military Science	2	Tr. Crops 52. Vegetable Improvement	3
Tr. Crops 51. Truck Crops	3	Elective	3
	17		17

Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 55. Farm Power	3	Agr. Engin. 54. Farm Machinery	3
Agron. 53. Miscellaneous Field Crops	3	Military Science	2
Bot. 51. Weed Control	3	Pl. Path. 52. Plant Diseases	3
Entom. 51. Entomological Practice	3	Soil Sci. 52. Soils	3
Military Science	2	Elective	4
Tr. Crops 53. Vegetable Varieties	3		
	17		15

Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products	3	Agr. Econ. 54. Farm Management	3
Agr. Econ. 55. Farm Bookkeeping	3	Agr. Engin. 50. Farm Mechanics	3
Agr. Engin. 50. Farm Mechanics	3	Agr. Engin. 52. Farm Structures	3
Hort. 53. Orchard Operations	2	Educ. 62. The Agricultural Code	3
Hort. 61. Viticulture	3	Entom. 52. Beekeeping	3
Lands. Gard. 50. General Landscape Gardening	4	Hort. 52. Plant Propagation	2
		Speech 50. Elements of Public Speaking	3

COURSES OF INSTRUCTION

EXPLANATION OF TERMS USED

Classification and Numbering.—The Two-Year Curricula courses (numbered 50–99) are designed to meet the special needs of students on the Davis campus. They afford, on the college level, semiprofessional and advanced vocational training in the different fields of agriculture, as well as elective opportunities in history, languages and literature, mathematics, and science.

Abbreviations.—The credit value of each course in units is indicated by a number in parentheses after the title. Varying units may be indicated for courses numbered 90, since the student is permitted to select the amount of work to be undertaken. The session in which the course is given is shown by the roman numeral I for the fall semester, or II for the spring semester. A course given throughout these two semesters is designated Yr. The hours, when not stated, will be arranged.

Year Courses.—A course given throughout the fall and spring semesters is designated by a double number. Animal Biology 51A–51B is an example. Each half of the course constitutes a semester's work. The first half is prerequisite to the second unless there is an explicit statement to the contrary. The instructor makes a final report on the student's work at the end of each semester. Unless otherwise noted, the student may take the first half only and receive final credit for it.

Credit.—One unit of credit is given for three hours of student effort per week throughout the semester. The three hours may be devoted to lectures, class discussions, laboratory work, field trips, or out-of-class preparation, at the discretion of the instructor.

AGRICULTURAL ECONOMICS

51. Marketing Agricultural Products. (3) I. Mr. Mehren, Mr. Robinson
Lectures, M W, 3, and one weekly recitation hour to be arranged.

Problems, types of marketing agencies, major marketing functions, marketing costs and margins, factors affecting prices of farm products, speculation, commodity exchanges and hedging, group or coöperative marketing, market control, market efficiency, role of government in marketing. Special emphasis on California products and marketing problems.

54. Farm Management. (3) II. Mr. Hedges, Mr. Robinson
Lectures, Tu Th, 3; laboratory: Sec. 1, Tu, 9–12; Sec. 2, W, 9–12; Sec. 3, Th, 9–12.

Economic factors affecting location of farm enterprises; choice and combination of enterprises; the calendar of operations; efficient use of labor, machinery, and land; production costs; analyzing the farm business; reorganizing

the farm and testing for efficiency; choice of farms, location, appraisal; profit and loss statements and measures of efficiency.

55. Farm Bookkeeping. (3) I.

Mr. Hedges, Mr. Robinson

Lectures, M W, 2; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12; Sec. 4, Th, 9-12; Sec. 5, F, 9-12.

Essentials of farm bookkeeping, types of records and their functions; use of cashbooks, journals, and ledgers; recording noncash items, inventories, depreciation and special records; analysis of records, profit and loss statements; use of double entry systems; enterprise accounting; income tax records and returns.

AGRICULTURAL ENGINEERING**50. Farm Mechanics. (3) I and II.**

Mr. Lewis

Lectures, Tu Th, 2; laboratory: Sec. 1, Tu, 9-12; Sec. 2, W, 9-12; Sec. 3, Th, 9-12.

Forging; soldering; plumbing; sheetmetal work; electric and acetylene welding and cutting; tool conditioning; power transmission as applied to line-shaft equipment and small power machinery; selection of shop tools and equipment; shop layouts.

51. Drawing. (2) I.

Mr. Lorenzen

Lecture, M, 3; laboratory: Sec. 1, M, 9-12; Sec. 2, F, 9-12.

Mechanical and detail drawing including orthographic plans, oblique cavalier, isometric, cabinet, and perspective views; freehand sketching; contour and section mapping; graphical presentation; care and use of drawing instruments.

52. Farm Structures. (3) II.

Mr. Belton

Lectures, M W, 8; laboratory: Sec. 1, Tu, 9-12; Sec. 2, W, 9-12; Sec. 3, Th, 9-12.

Prerequisite: Mathematics 50.

Planning of farm structures; requirements for production and storage structures; selection of materials, estimating of materials and costs; principles of framing; concrete work; painting.

54. Farm Machinery. (3) II.

Mr. Fairbank, Mr. Akesson

Lectures, Tu Th, 2; laboratory: Sec. 1, Tu, 9-12; Sec. 2, W, 9-12; Sec. 3, Th, 9-12.

Prerequisite: Mathematics 50.

Principles, construction, operation, adjustment, performance, power requirements, and selection of tillage, seeding, harvesting, and pest-control machinery; construction and testing of displacement, and centrifugal pumps and domestic water systems. Practical problems are regularly assigned to emphasize the lecture and laboratory work.

55. Farm Power. (3) I.

Mr. Tavernetti

Lectures, M W, 1; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12.

Prerequisite: Mathematics 50.

Principles, construction, operation, adjustment, and maintenance of various types of internal combustion engines, tractors, and electric motors; field operation of tractors. Regular problem assignments are made to supplement the class work.

57. Dairy Mechanics and Réfrigeration. (3) I.

Mr. Henderson

Lectures, Tu Th, 2; laboratory: Sec. 1, Tu, 9-12; Sec. 2, W, 9-12; Sec. 3, Th, 9-12.

Prerequisite: Mathematics 50.

Principles of steam generation and use, electricity, hydraulics, refrigeration, and air conditioning with their application to agriculture. Laboratory exercises include study, operation, maintenance, and testing of typical equipment.

AGRONOMY**51. Introduction to Agronomy. (3) I.**

Mr. Smith

Lectures, M W F, 3.

The principles and practices of field-crop production. Cropping systems to maintain fertility and soil productivity; including soil improvement, rotations, fertilization, erosion control, and the processes of land preparation, seeding, and tillage.

52. Cereals. (3) II.

Mr. Schaller

Lectures, Tu Th, 3; laboratory: Sec. 1, Tu, 9-12; Sec. 2, W, 9-12.

Classification, production, and use of the small grains, corn, and sorghum. Discussion of the factors determining quality and market classes; commercial grading and seed processing.

53. Miscellaneous Field Crops. (3) I.

Mr. Knowles

Lectures, Tu Th, 1; laboratory: Sec. 1, Tu, 9-12; Sec. 2, F, 9-12.

Adaptation, production, and use of the field bean, fiber, sugar, oil, and other field crops.

54. Forage Crops. (3) II.

Mr. Jones

Lectures, Tu Th, 2; laboratory: Sec. 1, Tu, 9-12; Sec. 2, Th, 9-12; Sec. 3, F, 9-12.

Classification, production, and use of forage plants for hay making, ensilage, and pasture. Commercial grading of forage crops such as hay, small-seeded legumes, and grasses. Factors determining quality of forage crop seeds; germination, purity, weed seeds, seed cleaning, and storage.

ANIMAL BIOLOGY**51A-51B. Animal Biology. (3-3) Yr.**

Mr. Storer (in charge), Mr. Asmundson, Mr. Casady, Mr. Cupps,
Mr. Goss, Mr. Gregory, Mr. Kleiber, Mr. Kratzer, Mr. Lorenz,
Mr. Miller.

Lectures, M W F, 1; demonstration-quiz section: Sec. 1, Tu, 1; Sec. 2, Tu, 2;
Sec. 3, Tu, 3; Sec. 4, Th, 1; Sec. 5, Th, 2; Sec. 6, Th, 3.

Structure, physiology, nutrition, and genetics of animals, with special
reference to domesticated livestock and poultry. Required of all students majoring
in the animal-production curricula.

ANIMAL HUSBANDRY**51. Principles of Animal Husbandry. (4) I.**

Mr. Howell, ——

Lectures, M W F, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, W, 9-12; Sec. 3,
F, 9-12.

Principles and practices of livestock production. The selection of market
classes and breeds of beef cattle, dairy cattle, sheep, hogs, and horses.

52. Feeds and Feeding. (3) II.

Mr. Howell

Lectures, M W F, 2.

Composition and use of feedstuffs.

56. Horse Production. (2) II.

Mr. Howell

Lecture, Tu, 1; laboratory, Tu, 9-12.

Prerequisite: Animal Biology 51A-51B and Animal Husbandry 52.

Breeding, feeding, and management of horses.

58. Milk Production. (2) II.

Mr. Mead, Mr. Ralston

Lecture, F, 8; laboratory, F, 9-12.

Prerequisite: Animal Biology 51A-51B and Animal Husbandry 52.

Breeding, feeding, and management of dairy cattle.

61. Swine Production. (2) I.

Mr. Hughes, Mr. Heitman

Lecture, Th, 8; laboratory, Th, 9-12.

Prerequisite: Animal Biology 51A-51B and Animal Husbandry 52.

Selection, breeding, feeding, and management of hogs.

63. Beef Cattle Production. (2) I.

Mr. Guilbert

Lecture, Tu, 8; laboratory, Tu, 9-12.

Prerequisite: Animal Biology 51A-51B and Animal Husbandry 52.

Selection, breeding, feeding, and management of beef cattle.

64. Sheep Production. (2) II.

Mr. R. F. Miller

Lecture, M, 1; laboratory, M, 9-12.

Prerequisite: Animal Biology 51A-51B and Animal Husbandry 52.

Selection, breeding, feeding, and management of sheep.

BACTERIOLOGY

- 61. Elementary Bacteriology.** (2) I. Mr. Mudge, Mr. Reynolds
Lectures, M W, 8.

Prerequisite: Chemistry 50 and Mathematics 50.

Fundamental principles of bacteriology and microbiology. Applications to such fields as soils, sanitation, food preservation and manufacture, technology, and animal and plant disease.

BOTANY

- 50. Elementary Botany.** (3) I and II. The Staff (Mr. Robbins in charge)

I. Lectures, M W, 8; demonstration: Sec. 1, M, 10; Sec. 2, W, 10; Sec. 3, F, 10.

II. Lectures, M W, 2; demonstration: Sec. 1, M, 9; Sec. 2, W, 9; Sec. 3, F, 9.

Principles underlying the structure, nutrition, growth, reproduction, and classification of plants. Special emphasis on plants of orchard, garden, and field. Basic information for students majoring in the plant-production curricula. A practical course employing laboratory demonstrations and lectures.

- 51. Weed Control.** (3) I. Mr. Robbins

Lectures, Tu Th, 8; laboratory: Sec. 1, Tu, 9-12; Sec. 2, Th, 9-12; Sec. 3, Th, 9-12.

Prerequisite: Botany 50, or equivalent, and consent of the instructor.

Weed characteristics and identification; principles of weed control including tillage, selective and nonselective chemical weed killers, soil sterilants, and machinery and equipment; analysis of special weed problems; laws and regulations.

CHEMISTRY

- 50. Elementary Chemistry.** (3) I and II. Mr. Brinton, Mr. Kepner
Lectures, M W F, 3.

DAIRY INDUSTRY

- 50. Elements of Dairying.** (3) I and II. Mr. Phillips

I. Lectures, Tu Th, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, Th, 9-12.

II. Lectures, Tu Th, 8; laboratory, M, 9-12.

The principles of dairying, including Babcock testing and analysis of milk and its products, the composition, properties, care, and handling of milk, and a brief survey of market milk, butter, cheese, ice cream, condensed milk, and powdered milk processes.

- 51. Cheesemaking.** (3) I. Mr. Phillips

Lecture, F, 8; laboratory, F, 9-4.

Prerequisite: Dairy Industry 50, which may be taken concurrently.

A study of milk quality and pasteurization of milk as related to quality of cheese, preparation and care of starters, the principles in the manufacture of casein, cottage cheese, cream cheese, cheddar, Monterey, granular, and brick

cheese; processed cheese, cheese spreads, including causes and remedies of the various defects commonly found in market cheese.

52. Buttermaking. (3) II.

Mr. Abbott

Lectures, M W, 2; laboratory, M, 9-12.

Prerequisite: Dairy Industry 50.

Problems involved in the procurement of raw material; principles; procedures and equipment used in pasteurization, churning, packaging; efficient methods of creamery operation; quality and defects of creamery butter.

53. Ice-Cream Making. (3) I.

Mr. Hubbell

Lectures, M W, 2; laboratory: Sec. 1, M, 9-12; Sec. 2, W, 9-12.

Prerequisite: Dairy Industry 50; Agricultural Engineering 57, which may be taken concurrently.

The calculation, pasteurization, and processing of ice-cream and ice-milk mixes. Operation of continuous, batch, and counter freezers in making ice cream, ice milk and sherbets, and the hardening and storing of these products. The causes and prevention of ice-cream defects.

54. Market Milk. (3) II.

Mr. Roadhouse

Lectures, Tu Th, 2; laboratory: Sec. 1, W, 9-12; Sec. 2, F, 9-12.

Prerequisite: Dairy Industry 50.

The operation of the market milk industry including conditions affecting quality of milk utilized for city supply; sanitary production, transportation, pasteurization, distribution, and inspection of milk and related products; a study of city milk ordinances and state dairy inspection regulations.

60. Creamery Practice. (3) I and II.

Mr. Hubbell

Lecture, F, 8; laboratory, six hours to be arranged.

Prerequisite: Dairy Industry 50 and 54, which may be taken concurrently.

Practice in processing dairy products and in the operation of the equipment used in the manufacture of cheese, butter, market milk, ice cream, condensed and powdered milk. Operation of refrigeration equipment and plant maintenance.

This course, with the consent of the instructor, may be repeated once for credit.

62. Dairy Plant Management. (3) II.

Mr. Hubbell

Lectures, Tu Th, 8; laboratory, Th, 9-12.

Prerequisite: Dairy Industry 50 and 60.

Problems involved in the organization, management, and operation of dairy plants. The keeping of records, merchandising, advertising, personnel management, and procurement of raw products as it pertains to dairy plants. Practice in plant layout and arrangement for efficient handling of products and use of labor.

EDUCATION

62. The Agricultural Code. (3) II.

Mr. Griffin in charge

Lectures, M W, 4; discussion hour to be arranged.

A study of the laws, regulations, and directives relating to California agricultural production; the organization and work of the California State Department of Agriculture; organization and work of the University of California Agricultural Experiment Station and Agricultural Extension Service, especially as related to the Department of Agriculture on the state and county levels. Frequent lectures are given by members of the State Department of Agriculture.

90. Special Problems. (1-5) I and II.

Mr. Griffin

Hours by arrangement.

Prerequisite: senior standing and consent of the instructor.

Individual work for students interested in rural problems.

ENGLISH

50. Business Writing. (3) I and II.

Mr. Fishman, Mr. Guyer, Mrs. Homann, Mrs. Jasper, Mrs. Needham, Mrs. Sikes, Miss Van Norden, Mrs. Wright

Lectures: Sec. 1, M W F, 1; Sec. 2, M W F, 2; Sec. 3, M W F, 3.

Practice in business correspondence—selling and ordering goods, extending credit and collecting accounts, making adjustments, applying for positions. Study of grammar, spelling, punctuation, sentence construction.

70. Introduction to Literature. (2-3) I and II.

Lectures, Tu Th, 2.

The Staff (Mrs. Homann in charge)

Prerequisite: English 50 or Subject A.

Novels, plays, and biographies of present-day interest, selected for class study and discussion.

The extra unit will be given for additional reading.

This course may be repeated once for credit.

90. Special Problems. (1-3) I and II. The Staff (Mrs. Wright in charge)

Hours to be arranged.

Prerequisite: English 50 or Subject A, and consent of the instructor.

Individual work in literature or composition for advanced students who, for some reason, are unable to enroll in a regular English course.

ENOLOGY—(See Horticulture)

ENTOMOLOGY AND PARASITOLOGY

51. **Entomological Practice.** (3) I. Mr. Bohart, Mr. Lange
Lectures, M W, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, W, 9-12; Sec. 3, F, 9-12.

Identification, life histories, habits, and control of injurious insects, particularly those affecting agricultural crops. Supervised field excursions will include collection of insects and observations of damage and control.

52. **Beekeeping.** (3) II. Mr. Eckert, Mr. Laidlaw
Lectures, M W, 8; laboratory, W, 9-12.

The business of beekeeping is taught from the viewpoint of the beginner and includes a study of the anatomy, life history, and habits of the honeybee; practice in the handling of bees; production and characteristics of honey; use of bees in pollination; a study of modern beekeeping equipment and methods.

90. **Special Problems.** (2-4) I and II. The Staff (Mr. Bailey in charge)
Hours to be arranged.

Prerequisite: consent of the instructor.

Special problems in beekeeping for advanced students and for those who have had prior experience in beekeeping, including the rearing of queens and package bees, disease control and apiary inspection, toxicity of various insecticides to beekeeping. Also, for selected students interested in quarantine and regulatory work, special problems are offered covering the quarantined insects, their identification, biology, and distribution as well as survey, inspection, and eradication procedures.

HISTORY

- 57A-57B. **History and Institutions of the United States** (3-3) I and II.

Mr. O'Brien, Mr. Shideler

I. 57A. Lectures, M W, 3; discussion hour to be arranged.

57B. Lectures, Tu Th, 3; discussion hour to be arranged.

II. 57A. Lectures, Tu Th, 3; discussion hour to be arranged.

57B. Lectures, M W, 3; discussion hour to be arranged.

History 57A is not prerequisite to History 57B.

57A. American national beginnings from colonial times through 1865.

57B. The American nation from the Civil War to the present.

The completion of *either* History 57A or 57B will satisfy the graduation requirement of American History and Institutions of the Two-Year Curricula.

- 58A-58B. **History of the Americas.** (3-3) Yr. Mr. Morrisey

Lectures, Tu Th, 2; discussion hour to be arranged.

History 58A is not prerequisite to History 58B.

58A. The colonial history of the Western Hemisphere, from Columbus to the end of the American Revolution.

58B. The national period of Latin-American history.

HORTICULTURE

- 50. Fruit Growing.** (3) I and II. I. Mr. Hesse; II. Mr. Hansen
 I. Lectures, M W F, 2.
 II. Lectures, M W F, 1.
 Prerequisite: Botany 50, which may be taken concurrently.
 Principles of fruit growing, with special reference to California conditions. The subjects considered will include pruning, propagation, rootstocks, varieties, pollination, fruit thinning, orchard soil management, disease and insect control, and effect of climate.
- 52. Plant Propagation.** (2) II. Mr. Hartmann, Mr. Hansen
 Lectures, M, 3; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12.
 Prerequisite: Botany 50.
 Principles and methods of propagation with special emphasis on fruit plants. Practice in grafting, budding, layering, and making of cuttings.
- 53. Orchard Operations.** (2) I. Mr. Baker
 Lectures, F, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12.
 Prerequisite: Horticulture 50, which may be taken concurrently.
 Lectures on nut crops, pome fruits, small fruits, and pruning. Laboratory studies of fruit species, pear packing, walnut harvesting, varieties of nuts and fruits, fruit-bud differentiation and fruit-bearing habits, and pruning.
- 54. Orchard Operations.** (2) II. Mr. Serr
 Lectures, M, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12.
 Prerequisite: Horticulture 53.
 Lectures on production and handling of peaches, apricots, plums, prunes, cherries, figs, and persimmons. Laboratory studies of orchard planting, spraying, frost protection, tree wiring, rootstocks, pollination, fruit thinning, nutritional deficiencies, and orchard management.
- 59. Citrus and Other Subtropical Fruits.** (3) I. Mr. Claypool
 Lectures, M W F, 2.
 Prerequisite: Horticulture 50.
 The production of the evergreen subtropical fruits including avocados, dates, and olives, with special emphasis on citrus. A study of the fundamental information relating to orchard management as applied to these fruits.
- 61. Viticulture.** (3) I. Mr. Olmo
 Lectures, Tu Th, 2; laboratory, Sec. 1, Th, 9-12.
 Prerequisite: Horticulture 50 or consent of the instructor.
 Climate in relation to grape production; grape development and ripening; history and distribution of grape growing; the principal varieties; harvesting, packing, and marketing grapes and raisins.

62. Vineyard Operations. (3) II.

Mr. Williams

Lectures, Tu Th, 3; laboratory: Sec. 1, Tu, 9-12; Sec. 2, Th, 9-12.

Prerequisite: Horticulture 50 or consent of the instructor.

Cultural operations in establishing and maintaining vineyards: planting; training; pruning; cultivation and irrigation; thinning and girdling. Vineyard insect and disease pests and their control. Vineyard management.

63. Enology. (3) I.

Mr. Amerine

Lecture, 1 hour to be arranged; laboratory, M F, 9-12.

Prerequisite: Chemistry 50, or equivalent; Bacteriology 61 and Horticulture 61, which may be taken concurrently.

Principles of wine production: production of table and dessert wines with special attention to the best varieties and the special methods required for each; fermentation control measures.

64. Enology. (3) II.

Mr. Amerine

Lectures, W F, 8; laboratory, F, 9-12.

Prerequisite: Horticulture 63 or consent of the instructor.

Wine handling: analysis; organoleptic examination; influence of environment and variety on composition and quality; wine types; aging; fining; filtering; bottling.

70. Enology Practice. (1-2) I and II.

Mr. Amerine

Two laboratory periods to be arranged.

Prerequisite: Horticulture 63, which may be taken concurrently.

Practice in winery operation and laboratory control for wines.

This course may be repeated once for credit.

90. Enology. (1-5) I and II.

Mr. Castor, Mr. Guymon

Lectures and/or laboratories to be arranged.

Prerequisite: consent of the instructor.

Special problems in enology. Students should enroll with Mr. Castor for work on yeasts and bacteria and with Mr. Guymon for work on distillation methods and brandy.

IRRIGATION**52. Plane Surveying. (3) II.**

Mr. Scott

Lectures, Tu Th, 8; laboratory, Th, 1-4.

Prerequisite: plane trigonometry and consent of the instructor.

Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.

53. Irrigation Practice. (3) I.

Mr. Marr

Lectures, Tu Th, 3; laboratory, Sec. 1, M, 9-12; Sec. 2, W, 9-12.

Prerequisite: Mathematics 50.

Soil moisture in relation to irrigation practice; water requirements of crops; preparation of land; design of ditches and pipe lines; measurements of water; development of water supplies; selection and operation of pumping plants.

LANDSCAPE GARDENING**50. General Landscape Gardening. (4) I and II.** _____

Lectures, Tu Th, 1; two 3-hour laboratories to be arranged.

Study of ornamental plants and uses in simple garden designs; arrangement of walks and drives; home garden areas; garden features; lawns; plans for home grounds.

53. Nursery Practice. (2) I. _____, Mr. Arnold

Lecture, Th, 9; laboratory, Th, 10-12; one hour by arrangement.

Prerequisite: Landscape Gardening 50 and 60.

Propagation and care of ornamental plants in seed beds, cold frames, lathhouses and nursery; lining out and planting nursery stock; seed collection, propagation, and nursery care.

54. Advanced Nursery Practice. (2) II. _____, Mr. Arnold

Lecture: Sec. 1, Th, 9; Sec. 2, F, 9. Laboratory: Sec. 1, Th, 10-12; Sec. 2, F, 10-12. One hour by arrangement.

Prerequisite: Landscape Gardening 50 and 53.

Field work with ornamental plants; digging, balling, canning, pruning trees and shrubs; assembling and packing nursery stock; nursery sales; field trips to nurseries.

55. Floriculture. (2) I. _____

Lecture, Tu, 9; laboratory, Tu, 10-12; one hour by arrangement.

Prerequisite: Landscape Gardening 50, which may be taken concurrently.

Study of greenhouse, lathhouse, and garden culture of flowering and foliage plants; cut flowers and potted plants under glass; propagation and study of annuals, herbaceous perennials, bulbs, and bedding plants.

56. Advanced Floriculture. (2) II. _____

Lecture: Sec. 1, Tu, 9; Sec. 2, W, 9. Laboratory: Sec. 1, Tu, 10-12; Sec. 2, W, 10-12. One hour by arrangement.

Prerequisite: Landscape Gardening 50 and 55.

Greenhouse management and other problems related to floriculture practice; simple floral designs and corsages; study of plant responses to increase and decrease of light; gravel culture.

57. Tree Care. (2) I. _____

Lecture, M, 9; laboratory, M, 10-12; one hour by arrangement.

Prerequisite: Landscape Gardening 50 and 60.

Care of shade trees: pruning; topping, bracing, treatment of wounds and filling of cavities; use of ropes, knots, and slings. Climbing. Equipment and materials: saws, shears, gouges, chisels, and scrapers. Cavity sterilizers and filling materials.

- 60. Advanced Plant Materials.** (2) I and II. Mr. Arnold
Lectures, Tu Th, 2.
Prerequisite: Landscape Gardening 50.
Growth habits of flowering and fruiting ornamental trees and shrubs; study of environment and tolerance; landscape use.
- 90. Special Problems.** (2-6) I and II. _____
Hours by arrangement.
Prerequisite: Landscape Gardening 50. Open only to major students in landscape gardening with high scholastic standing, and with consent of the instructor.

MATHEMATICS

- 50. Elementary Mathematics.** (3) I and II.
Mr. Alder, Mr. Arnold, Mr. G. A. Baker, Mr. Burdette, Mr. Fulton, Mr. Hayes, Mrs. Rolfe, Mr. Roessler, Mr. Steck
I. Lectures: Sec. 1, M W F, 1; Sec. 2, M W F, 2.
II. Lectures: Sec. 1, M W F, 8; Sec. 2, M W F, 1.
Review of the principles of arithmetic, elements of algebra, ratio and proportion, percentage with applications to agriculture, mensuration, building construction, farm mechanics, and an introduction to the mathematics of finance.
- 52. General Mathematics.** (3) II. Mrs. Rolfe
Lectures: M W F, 3.
Prerequisite: Mathematics 50.
The use of logarithms and trigonometric functions; introduction to the mathematics of finance and business; elements of probability and statistics.

MILITARY SCIENCE AND TACTICS

- 51A. Basic (First Year).** (2) I. The Staff
(Formerly 10A and/or 50A.)
Lectures: Sec. 1, M W, 1; Sec. 2, M W, 2; Sec. 3, Tu Th, 9; Sec. 4, Tu Th, 11; Sec. 5, Tu Th, 1; Sec. 6, Tu Th, 2. Drill, Tu, 4-6.
Required of all physically fit male students unless granted specific exemption.
World military situation; military organization; leadership, drill and exercise of command; individual weapons and marksmanship; National Defense Act and R.O.T.C.
- 51B. Basic (First Year).** (2) II. The Staff
(Formerly 10B and/or 50B.)
Lectures: Sec. 1, M W, 1; Sec. 2, M W, 2; Sec. 3, Tu Th, 9; Sec. 4, Tu Th, 11; Sec. 5, Tu Th, 1; Sec. 6, Tu Th, 2. Drill, Tu, 4-6.
Prerequisite: Military Science 51A.
Required of all physically fit male students unless specific exemption is granted.
World military situation; hygiene and first aid; leadership, drill, and exercise of command; maps and aerial photographs.

52A. Basic (Second Year). (2) I.

The Staff

(Formerly 11A and/or 60A.)

Lectures: Sec. 1, M W, 1; Sec. 3, Tu Th, 11; Sec. 4, Tu Th, 1; Sec. 6, W F, 11.
Drill, Tu, 4-6.

Prerequisite: Military Science 51A and 51B, or their equivalents.

Required of all physically fit male students unless specific exemption is granted.

World military situation; leadership, drill, and exercise of command; maps and aerial photographs; military administration; military law and boards.

52B. Basic (Second Year). (2) II.

The Staff

(Formerly 11B and/or 60B.)

Lectures: Sec. 1, M W, 1; Sec. 3, Tu Th, 11; Sec. 4, Tu Th, 1; Sec. 6, W F, 11.
Drill, Tu, 4-6.

Prerequisite: Military Science 52A.

Required of all physically fit male students unless specific exemption is granted.

World military situation; leadership, drills, and exercise of command; physical development methods, evolution of warfare.

90. Advanced Infantry. (3) I and II.

The Staff

(Formerly 106A, 106B, 107A, 107B.)

Lectures: three hours per week to be arranged. Drill, Tu, 4-6.

For selected students who have successfully completed the basic course or its equivalent.

Military leadership, psychology, personnel management; occupied territories; military law and boards; leadership, drill, and exercise of command; military problems of the United States; military teaching methods; psychological warfare; military mobilization and demobilization; infantry tactics and techniques.

This course may be repeated for credit.

MUSIC**50A-50B. University Band. (1) I and II.**

Mr. McArdell

One 2-hour rehearsal.

Prerequisite: technical proficiency sufficient to meet requirements of performance.

Rehearsal and performance of band music. May be repeated once without duplication of credit.

57A-57B. Introduction to Musical Literature. (2) I and II. Mr. McArdell

Lectures, Tu Th, 8.

Music 57A is not prerequisite to 57B.

Lectures, illustrations, and readings designed to furnish a general appreciation of music.

60A-60B. University Chorus. (1) I and II.

Mr. McCardell

Two 1-hour rehearsals.

Rehearsal and performance of choral music. May be repeated once without duplication of credit.

70A-70B. University Symphony Orchestra. (1) I and II.

Mr. McCardell

One 2-hour rehearsal.

Prerequisite: technical proficiency sufficient to meet requirements of performance.

Rehearsal and performance of symphonic music. May be repeated once without duplication of credit.

PHYSICAL EDUCATION

The incidental fee, payable by all students at the time of registration, entitles students to the use of the gymnasium, swimming pool, showers, towels, lockers, tennis courts, and the athletic fields. Equipment for games and sports are available for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit.

Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department.

50. Physical Education for Men. ($\frac{1}{2}$) I and II.

Mr. Boyer, Mr. Forbes, Mr. Hickey, Mr. Schall,
Mr. Stromgren, Mr. Toomey, Mr. E. S. Wilson

Sections meet twice weekly at various hours.

Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch football, track, wrestling, swimming, and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football, basketball, and boxing, and receive credit in physical education.

This course may be repeated for credit not to exceed a total of two units.

60. Physical Education for Women. ($\frac{1}{2}$) I and II.

Miss Welch

Sections meet twice weekly at various hours.

Sections are organized in archery, badminton, tennis, volleyball, riding, swimming, lifesaving, and swimming formations.

This course may be repeated for credit not to exceed a total of two units.

PLANT PATHOLOGY

52. Plant Diseases. (3) II.

Mr. Oswald, Mr. Grogan

Lectures, Tu Th, 1; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12.

Prerequisite: Botany 50.

Identification, cause, contributing factors, and the control of some diseases important to California agriculture. Examples for study will include diseases of fruit and nut trees, field and truck crops, and ornamental plants.

POMOLOGY—(See Horticulture)

POULTRY HUSBANDRY

- 51. Elementary Poultry Production. (3) I.** Mr. Wilson
Lectures, Tu Th, 8; laboratory: Sec. 1, Tu, 9-12; Sec. 2, Th, 9-12.
This introductory course in poultry husbandry is designed to give a general working knowledge of poultry production. It includes a study of the following: different breeds of chickens, artificial incubation and brooding, rearing, and housing. Students are taught to cull chickens. Marketing poultry and eggs is discussed.
- 52. Principles of Poultry Husbandry. (3) II.** Mr. Wilson
Lectures, Tu Th, 1; laboratory: Sec. 1, Tu, 9-12; Sec. 2, Th, 9-12.
Prerequisite: Animal Biology 51A-51B, which may be taken concurrently, and Mathematics 50.
This is a continuation of Poultry Husbandry 51. A brief introduction to poultry feeding and poultry breeding is given. The course takes up reproduction, anatomy, and physiology of chickens. The importance of poultry diseases and sanitation is discussed. Fryer production and management are included in the course.
- 53. Incubation and Brooding Practice. (3) I.** Mr. Wilson
One 1-hour conference period a week and practice daily, including Sunday, for nine weeks, 7:30-8:00 a.m., 12:00 noon to 12:15 p.m., 4:00-5:00 p.m.
Prerequisite: Poultry Husbandry 51, which may be taken concurrently, and consent of the instructor.
This course is designed to give students practical experience in the operation of incubators and brooders. The students keep detailed records of their incubation and brooding operations.
- 54. Pen Practice. (2) II.** Mr. Lorenz
One 1-hour conference period a week and practice daily, including Sunday, for six weeks, 7:30-8:00 a.m., 12:00 noon to 12:15, 4:00-5:00 p.m.
Prerequisite: Poultry Husbandry 51 and consent of the instructor.
Intensive practice in management of laying hens, care of a small flock, feeding, culling, handling eggs, and keeping accurate records.
- 55. Utility Poultry Breeding. (2) I.** Mr. Asmundson
Lectures, M W, 2.
Prerequisite: Poultry Husbandry 51 and 52, which may be taken concurrently.
A review of what is known about the inheritance of economically important characters and the application of this knowledge to breeding poultry.

56. Turkey Production. (2) II.

Mr. Asmundson

Lectures, Tu Th, 2.

Prerequisite: Poultry Husbandry 51 and 52.

A review of present knowledge concerning inheritance in turkeys; selection of breeding stock; setting up breeding programs; care of hatching eggs and incubation; brooding and rearing; sanitation; nutrition and feeding; marketing.

57. Poultry Nutrition. (2) I.

Mr. Kratzer

Lectures, M W, 3.

Prerequisite: Poultry Husbandry 52, Chemistry 50, Animal Biology 51A-51B.

Principles of poultry nutrition; symptoms of deficiencies; specific nutritive requirements of poultry; composition of feedstuffs and the formulation of rations to meet the requirements for growth, egg production, reproduction, and fattening.

59. Market Eggs and Poultry. (2) I.

Mr. Lorenz, Mr. Wilson

Lecture, F, 8; laboratory, F, 9-12.

Prerequisite: Poultry Husbandry 51 and 52.

Half of the course deals with recognition of egg quality factors and the preservation of egg quality by proper handling. The second half of the course takes up the preparation of poultry for market.

90. Special Problems. (1-2) I and II. The Staff (Mr. Asmundson in charge)

Hours to be arranged.

Prerequisite: Poultry Husbandry 51 and 52, which may be taken concurrently, and consent of the instructor.

SOIL SCIENCE**52. Soils. (3) II.**

Mr. Brown

Lectures: Tu Th, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12; Sec. 3, W, 9-12; Sec. 4, Th, 9-12.

This is a survey course. The natural origin of soils, the properties of soils, and soil moisture are discussed. Special soil problems, for example, those concerned with alkali and acid soils are emphasized. The early part of the course is presented as a background to the broad problem of soil management, which is treated in the final group of studies. Soil management involves fertilization, tillage, weed control, crop adaptation, and erosion control.

SPANISH**51. Spanish. (3) I.**

Mr. Nelson

Lectures, M W F, 2.

An introduction to practical Spanish. Emphasis on useful vocabulary and expressions. Practice in conversation and reading.

SPEECH**50. Elements of Public Speaking. (3) I and II.**

Mr. Fishman, Mr. Guyer, Mrs. Homann, Mrs. Needham,
Mrs. Sikes, Miss Van Norden, Mrs. Wright

Lectures: M W F, 1.

Prerequisite: English 50 or Subject A.

Practice in giving short speeches of introduction, welcome and farewell, presentation and acceptance, nomination. Discussion of current topics. Emphasis upon effectiveness in preparation and delivery.

52. Principles and Types of Speech. (3) II.

Lectures: M W F, 1.

The Staff (Mrs. Wright in charge)

Prerequisite: Speech 50.

TRUCK CROPS**51. Truck Crops. (3) I.**

Mr. Harrington

Lectures, Tu Th, 8; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12.

The principles and practices of truck-crop production. A survey of the vegetable industry. Varieties, adaptation to climate and soil, cropping systems, land preparation, fertilization, culture, harvesting, marketing, and grading.

52. Vegetable Improvement. (3) II.

Mr. Davis

Lectures, Tu Th, 3; laboratory: Sec. 1, M, 9-12; Sec. 2, Tu, 9-12.

Prerequisite: Botany 50; and Truck Crops 51, or Agronomy 51, or Landscape Gardening 50, or Horticulture 50.

The principles of heredity as applied to vegetable improvement. Methods and techniques of hybridization, selection, maintenance, and improvement of vegetable varieties. Production, harvesting, and storage of vegetable seeds.

53. Vegetable Varieties. (3) I.

Mr. Smith

One discussion period to be arranged; laboratories, Th S, 9-12.

Prerequisite: Truck Crops 51.

The identification, classification, and origin of vegetable crops. Study of the history, uses, advantages, and limitations of the principal California and U. S. vegetable varieties.

90. Special Problems. (2-4) II.

The Staff (Mr. Knott in charge)

Hours to be arranged.

Prerequisite: consent of the instructor.

VETERINARY SCIENCE

51. Animal Hygiene. (2) I.

Mr. Hage

Lectures, Tu Th, 1.

Prerequisite: Animal Biology 51A-51B.

The general principles of disease control. The various causes of disease are discussed with relation to methods of prevention. Emphasis is placed on the maintenance of the health of the herd or flock rather than on major treatment or surgery of sick animals. Specific epidemics of economic importance to domestic livestock production are also discussed.

VITICULTURE—(See Horticulture)