

UNIVERSITY

OF

CALIFORNIA

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GENERAL

CATALOGUE

1948 - 49

UNIVERSITY OF CALIFORNIA

# General Catalogue

*Admission and Degree Requirements*

*Announcement of Graduate and  
Undergraduate Courses of Instruction*

FALL AND SPRING SEMESTERS

**1948-1949**

AUGUST 15, 1948

*Primarily for Students in the*  
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# CALENDAR, 1948-1949

Referring Primarily to the Departments of the University at Berkeley

## FALL SEMESTER, 1948-1949

*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. 16, 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. 24, Tuesday Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.
- Sept. 13, Monday Fall semester begins.
- Sept. 14, Tuesday Subject A Examination, 2 to 5 P.M.
- Sept. 15, Wednesday Other qualifying examinations for admission to certain courses, including Chemistry 1A, Journalism 130A, and Mathematics 3 and 3A, will be held.
- Sept. 16, Thursday } Registration of students, graduate and undergraduate, in the  
Sept. 17, Friday } departments at Berkeley for courses of the fall semester.  
Sept. 18, Saturday }  
Sept. 20, Monday } Instruction begins.  
Sept. 30, 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 February, 1949, file announcement of candidacy before 5 P.M., at the Office of the Registrar, Administration Building.
- Oct. 4, Monday Last day for filing applications in candidacy for the master's degree, and the degree of Engineer to be conferred in February, 1949; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
- Oct. 11, Monday Last day for filing applications in candidacy for professional higher degrees (except the degrees of Engineer and Graduate in Architecture), and for the degree of Doctor of Philosophy, to be conferred in June, 1949; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
- Oct. 25, Monday Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in February, 1949; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
- Nov. 13, 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 February, 1949.
- Nov. 25, Thursday Thanksgiving Day—an academic and administrative holiday.
- Dec. 20, Monday } Christmas recess—an academic holiday.  
Dec. 31, Friday }  
Dec. 25, Saturday } Christmas Day—an academic and administrative holiday.  
Dec. 31, Friday } Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1949-1950.
- Jan. 1, Saturday New Year's Day—an academic and administrative holiday.
- Jan. 3, Monday Instruction resumes.
- Jan. 3, 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 February, 1949.
- Jan. 17, Monday } Final examinations in the departments at Berkeley.  
Jan. 27, Thursday }  
Jan. 27, Thursday } Fall semester ends.

## SPRING SEMESTER, 1949

- Jan. 15, Saturday Applications for admission to the spring semester and credentials to be filed with the University Admissions Director.
- Jan. 18, Tuesday Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
- Feb. 7, Monday Spring semester begins.
- Feb. 10, Thursday }  
 Feb. 11, Friday } Registration of students, graduate and undergraduate, in the  
 Feb. 12, Saturday } departments at Berkeley for courses of the spring semester.
- Feb. 14, Monday Instruction begins.
- Feb. 15, Tuesday Last day for entering students to file applications for undergraduate scholarships for 1949-1950.
- Feb. 21, Monday Last day for filing applications for fellowships and graduate scholarships for 1949-1950.
- Feb. 22, Tuesday Washington's Birthday—an academic and administrative holiday.
- Feb. 24, 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, 1949, file announcement of candidacy before 5 P.M., at the office of the Registrar, Administration Building.
- Feb. 28, Monday Last day for filing applications in candidacy for the master's degree and the degree of Engineer, to be conferred in June, 1949; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 7, Monday 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, 1949; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 7, Monday Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1949; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
- Apr. 2, 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, 1949.
- Apr. 25, Monday }  
 Apr. 30, Saturday } Spring recess—an academic holiday.
- May 16, 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, 1949.
- May 30, Monday Memorial Day—an academic and administrative holiday.
- June 6, Monday }  
 June 16, Thursday } Final examinations in the departments at Berkeley.
- June 16, Thursday Spring semester ends.

# THE REGENTS OF THE UNIVERSITY

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1228 N Broadway, Santa Ana

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619 Title Insurance bldg, Los Angeles 13

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Litt.D.  
President of the University  
250 Administration bldg, Berkeley 4  
203 Administration bldg, Los Angeles 24

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The term of the appointed Regents is sixteen years, and terms expire March 1 of the years indicated in parentheses. The names are arranged in the order of original accession to the Board.

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425 S Windsor blvd, Los Angeles 5

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Crocker First National Bank bldg, San  
Francisco 4

CHARLES COLLINS TEAGUE, LL.D. (1962)  
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SIDNEY M. EHRMAN, B.L., LL.B. (1952)  
700 Nevada Bank bldg, San Francisco 4

AMADEO PETER GIANNINI (1950)  
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San Francisco 4

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1521 Wilshire blvd, Los Angeles 14

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458 S Spring st, Los Angeles 13

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600 Market st, San Francisco 4

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111 Sutter st, San Francisco 4

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842 Title Insurance bldg, Los Angeles 13

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Jno. U. Calkins, Jr., B.L., J.D.  
Attorney  
910 Crocker bldg, San Francisco 4

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Associate Attorney for the Regents and  
Attorney in Residence Matters  
910 Crocker bldg, San Francisco 4

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240 Administration bldg, Berkeley 4

George F. Taylor, B.S.  
Assistant Secretary  
101 Administration bldg, Los Angeles 24

Marjorie J. Woolman  
Assistant Secretary  
240 Administration bldg, Berkeley 4

# THE UNIVERSITY OF CALIFORNIA

NOTE.—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.

## ADMINISTRATIVE STAFF

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

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250 Administration bldg, Berkeley 4  
203 Administration bldg, Los Angeles 24

### *Vice-President and Provost of the University, Emeritus:*

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### *Vice-President of the University and Dean of the College of Agriculture:*

Claude B. Hutchison  
101 Giannini Hall, Berkeley 4

### *Vice-President and Provost of the University:*

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### *Attorney for the Regents:*

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910 Crocker bldg, San Francisco 4

### *Assistant to the President:*

George A. Pettitt  
225 Administration bldg, Berkeley 4

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Herman A. Spindt  
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105 Administration bldg, Los Angeles 24

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<sup>2</sup> In residence spring semester only, 1948-1949.

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Office Building C, Berkeley 4

# 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 Institute of Child Welfare

The Institute of Experimental Biology

The Institute of Industrial Relations

The Institute on Traffic Engineering

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

**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, Civic 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, Philosophy, 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†**

University of California at Los Angeles:

College of Letters and Science

College of Business Administration

College of Applied Arts

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

College of Engineering

School of Education

School of Law

School of Public Health (in part)

Graduate Division, Southern Section

The Summer School of Surveying

Bureau of Governmental Research

The Institute of Geophysics

The Senator William Andrews Clark Memorial Library

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)

\* A division of the Medical School.

† A more detailed description of instruction offered at Los Angeles will be found on page 22.

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.

\* For a list of the administrative staff of the University at Berkeley, and elsewhere, see page 11.

## 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, 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, and 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 communications, illumination, industrial electronics and control, physics, and power.

In Mechanical Engineering, the student has a choice of options in air conditioning and refrigeration, automotive, fluid mechanics, heat power, heat transfer and thermodynamics, 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, and 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, 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 Secretary 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 following higher degrees and certificates:

Master of Public Health, Doctor of Public Health, Certificates in Public Health for Health Officers, Public Health Engineers, Statistical Technicians, Laboratory Technicians, Health Educators.

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: two six-year curricula leading to the degrees of Bachelor of Science and Doctor of Dental Surgery; and a curriculum, limited to women students, in the training of dental hygienists.

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.

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 leading to the following advanced professional degrees: Master of Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Metallurgical Engineering, Mining Engineering, and Petroleum Engineering.

#### *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 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 present an acceptable thesis or pass a comprehensive examination.

Professional training in the field of urban planning is offered for qualified graduate students in the Department of Civic Planning, established July, 1948.

#### UNIVERSITY OF CALIFORNIA AT LOS ANGELES

The University of California at 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, the Medical School, and the College of Chemistry; (b)

the College of Applied Arts, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science, and 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 most of the courses of the first two years of the curricula in civil, electrical, mechanical engineering, and mining and metallurgy, third-year courses of most of the curricula, and restricted fourth-year offerings; (f) the School of Education, with teacher-training curricula leading to certificates of completion for the general secondary and junior college credentials; 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 1948 two such summer sessions of six weeks each were conducted, the first session beginning June 21, and the second beginning August 2. Information concerning the Summer Sessions of 1949 will be published in the ANNOUNCEMENT OF THE SUMMER SESSIONS, obtainable upon request from the Office of the Summer Sessions, 222 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.

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

(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 information concerning credit for extension courses, see page 23.

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; 10 Administration Building, University of California, Los Angeles 24; 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 seven branch libraries, and eighty-five departmental and special libraries. These groups, collectively known as the University Library, contain more than 1,423,000 volumes. Approximately 17,000 periodicals and serials are received currently.

The principal collection of the General Library is housed in the Charles Franklin Doe Library Building. 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 biological sciences. Other branches are the Chemistry Library in Gilman Hall, the Lange Library of Education in Haviland Hall, the Engineering Library in the Engineering Building, the Forestry Library in Giannini Hall, the Music Library in the Music Building, and the Library School Library in the main library 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 Charles Franklin Doe Library Building. The Bureau of International Relations has its own collection and reading room in South Hall, situated near the Department of Political Science. Besides these, there are many departmental libraries, varying in size and availability, the largest being the libraries of Architecture and Physics.

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 slips 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 Librarian 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.

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.

#### 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. The transcripts must show that the applicant has been 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.

† 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.

\* 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.



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.
- (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 zoology. 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 recognized by the University as fulfilling the regulations laid down by the Regents of the University for the accrediting of secondary schools in California. The list of accredited schools is published by the University annually in the month of June or July. For blank forms of application for accrediting and for other information, school 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 27, 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 64-67) and thereby will give the student greater opportunity in his freshman and sophomore years at the

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

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 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 may be removed 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 may clear his deficiencies by satisfac-

tory grades in courses acceptable for removing his subject shortages, and present either:

- (a) Sixty units with at least a grade C average in college transfer courses, or
  - (b) A minimum of 15 units of college transfer courses with an average of 1.5 grade points. 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 (non-degree 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 29).

#### Admission in Advanced Standing

An applicant for admission to the University in advanced standing must present evidence that he has satisfied the subject and scholarship requirements prescribed for the admission of high school graduates in freshman standing and that his advanced work in institutions of college level has met the scholarship standard required of transferring students, namely, an average of grade C or higher in all college courses undertaken.

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 direct to the University Admissions Director. A statement of honorable dismissal from the last college attended must also be sent.

An applicant, who on graduation from high school did not qualify for admission in freshman standing, must present evidence that he has made up all subject deficiencies and, in addition, has completed:

(a) Not less than 60 semester units of work acceptable for advanced standing in the University, with a scholarship average of at least grade C, or

(b) Not less than 15 semester units of acceptable advanced work with a distinctly high scholarship average.

#### 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 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.

#### LIMITATION OF ENROLLMENT IN CERTAIN COLLEGES OR COURSES

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 1948-1949, however, it is necessary to restrict enrollment in the College of Engineering in the 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 non-residents in certain of the professional schools. Students desiring to enter these departments or schools should keep in close touch with their high school or junior college counselors, who will be informed as to dates of application and required aptitude examinations.

### 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 (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 and schools within the University of California as well as to those outside. 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. Applicants for admission to the Medical School in which registration is limited



to seventy-two in each class should file their credentials with the Admissions Office, 103 Pharmacy Building, University of California Medical Center, San Francisco 22, California. Such credentials should be accompanied by a money order or bank draft for \$5 (no part of which will be refunded) 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. *In the absence of a diploma or other official evidence of graduation or degree, registration will not 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. No part of this fee is refunded.

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.

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.

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

\* For information on graduate courses at Davis, consult the ANNOUNCEMENT IN AGRICULTURE AND RELATED SCIENTIFIC FIELDS, which may be obtained upon request from the Dean of the Graduate Division, University of California, Berkeley 4, California.

## 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 33.

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 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 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. 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 gastro-

intestinal 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 1, in English 1-2, or in the Comprehensive Examination in English, 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.
2. By completing any two of the following courses, subject to the conditions noted below: \* American Institutions 101 (Summer Session), or XB7ABC

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\* Students taking the above 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.

or X7AB (University Extension); Business Administration 155 (not included in Letters and Science List of Courses); 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 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

All undergraduate male students must, upon admission to the University, report immediately to the proper officers for enrollment in military science, in accordance with instructions 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. 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.

### 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 freshmen and any other students 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 instruction 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 \$1 is charged. In 1948-1949 these dates are: Thursday, September 30, for candidates who expect to complete their work in February, 1949, and Thursday, February 24, for candidates for graduation in June, 1949.

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 deter-

mines 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 the return of his report.

### 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 super-

vision 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 43). 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 Director of Admissions 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 concerned), 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 pass-

ing 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 fifty cents 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 street car or 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 is given on page 52.

*Incidental fee.*—The incidental fee is \$35 each semester, for both undergraduate and graduate students. This fee, which must be paid on the date of registration, covers certain expenses of students for use of laboratories, library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, 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 THE  
FALL AND SPRING SEMESTERS

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.....	25.00	25.00	43.00	43.00	63.00	63.00
A.S.U.C. Membership.....	10.00	10.00	10.00	10.00	10.00	10.00
Board and Room.....	*331.00	*360.00	500.00	580.00	590.00	700.00
Miscellaneous (Recreation, club dues, laundry, drugs, etc.)....	35.00	46.00	80.00	130.00	206.00	286.00
Total.....	\$471.00	\$511.00	\$703.00	\$833.00	\$939.00	\$1129.00

\* Minimum price quoted 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 54. 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 cost on an average of from \$25 to \$45 a year. 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 37). For the tardy performance of certain routine procedures—such as late registration, late filing of study lists, etc.—fees are imposed which range from \$1 to \$2.

Membership in the Associated Students of the University costs \$10 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 athletics and student-body and class activities.

*NOTE.*—It is impossible to include in the above 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.

Students of the University who were in attendance throughout the Spring Term of 1944, and who were not exempted from payment of the tuition fee, will be allowed the privilege of paying only \$75 per semester for tuition, so long as they continue in attendance upon subsequent terms or semesters without interruption.

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 Gov-

ernment 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 nonresident 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, 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 scholar-

ship 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

Lists of approved boarding and lodging houses for women, information about accommodations for men, and advice and information about other types of accommodations may be obtained from the Housing Office, Building Q, University of California, Berkeley 4, California. The University is within commuting distance of Oakland and other Eastbay cities, and San Francisco.

The cost of board and lodging depends entirely on the type of accommodation desired. In the boarding houses and residence halls the estimated cost per semester is between \$250 and \$295 for men, and between \$230 and \$335 for women. In most boarding houses the cost includes room and twelve or fourteen meals a week. In 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 \$37 to \$44 a month; in coöperative houses for single women, between \$40 and \$43 a month. Apartments vary greatly in price depending on size and location, but they are difficult, if not impossible, to obtain.

Householders and students are expected, at the time a room is engaged, to have a contract in writing covering terms of payment, stating number of meals served a day, if rent is to be paid during vacation, use of baths, laundry privileges, and any other matters that 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. It is understood that rooms are engaged for the entire semester unless other arrangements are made in advance.

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.

*Stern Hall*, a residence hall for women students, is a gift of Mrs. Sigmund Stern. It accommodates 90 women. The price for room and board is \$325 a semester. Application must be made to the Housing Office at least five months in advance of prospective residence.\*

*Bowles Hall*, a residence hall for men, is a memorial to the late Philip Ernest Bowles, member of the Class of 1882 and for twelve years a Regent of the University. Two hundred and six undergraduate men can be accommodated. Applications for residence may be obtained from the Housing Office approximately five months in advance of prospective attendance. The charge for room and board is \$295 a semester.\*

*Fernwald Halls*, at Hillside Avenue and Dwight Way, comprise seven residence halls for women. Each hall has its own designation, named to honor women who have been associated with the University: Mitchell, Peixotto, Richards, Oldenberg, Freeborn, Cheney, and Cunningham. The price for room and board, with three students in a room, is \$290 a semester. Application should be made to the Housing Office, Building Q.

*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 Dean of 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 here. There are also several local sororities and clubs. Each of these organizations provides living quarters for its members. The sorority and club houses are approved by the University. Membership in these organizations is by

\* 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.



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 semester.

### 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.

(1) 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.

(2) 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.

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

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\* 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.

Women students can always be placed in private homes to work eighteen hours a week in exchange for room, board, and \$10 a month. 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 to find part-time work, and graduates other than teachers to obtain 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, 102 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**

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. This office 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 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 Entitlement (Veterans Administration Form 7-1950) 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 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. 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.*—A circular giving information about undergraduate scholarships may be obtained from the Committee on Undergraduate 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 February 15 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 21, 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 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, pharmacy, 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 Professor R. N. Walpole.

*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 or the School of Jurisprudence) 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 37.)

Military Science and Tactics, 8 units (men). (See page 39.)

(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 1A, 1B, 2.

Paleontology 1, 10.

Physics 2A-2B, 3A-3B\*, 4A-4B-4C\*\*, 10.

Physiology 1A, 1C\*.

Zoology 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.



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, 8, 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: Course 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 2.  
 Sociology and Social Institutions 1-2, 10A-10B.

*Group 5—Philosophy*

- Philosophy 6A-6B.  
 Philosophy 10A-10B.

*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 9A, 9B, 9C.  
 German 9A, 9B, 9C, 9D.  
 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 the University Extension. For a list of such courses, see the announcements of the 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 the 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 students who receive honorable mention with the degree of Associate in Arts

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

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 84). 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 38).

5. *At least 36 units of work chosen from the upper division courses named in the Letters and Science list* (see page 84), 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 coördinated 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 or the School of Jurisprudence, 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, pages 40-41.

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

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:* Mr. J. D. HART.

*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.

#### AMERICAN LITERATURE

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.

#### CHILD DEVELOPMENT

*Group Major Adviser:* Miss LANDRETH.

*Preparation for the Major.*—Required: Psychology 1A, Psychology 5 or Economics 40 (two years of high school algebra, or Mathematics D), Economics 1A, Physiology 1A, Physiology 1C. Recommended: Psychology 1B or 2, 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 103, Public Health 125, Social Welfare 100. Recommended: Psychology 107 (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 9A; Philosophy 10A-10B; English 1A-1B. Recommended: German 9A; 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 10A-10B; Economics 1A-1B; Art 1B or Music 27B or 30B. Recommended: English 41A-41B; Architecture 5C; French 9B; German 9C.

*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, 150A-150B, 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 145A; Philosophy 108; 3 to 6 units of directed research in the senior year on selected topics; and 6 units from Sociology and Social Institutions 141; Journalism 190; Psychology 180; Political Science 115, 159, 157A-157B; Economics 101A-101B; Philosophy 104; Business Administration 125, 151; 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:* ———.

*Preparation for the Major.*—Chemistry 1A-1B, 5, 8, 9; Physics 2A-2B, 3A-3B; Psychology 1A-1B; Physiology 1A, 1C, or Zoölogy 1A-1B.

*The Major.*—Biochemistry 103; Political Science 167A-167B, 168A-168B, 169; Psychology 168; Zoölogy 119A-119B. Recommended: Anatomy 102;

Anthropology 2A-2B, 150A-150B; Bacteriology 1, 4; Biochemistry 104, 107; Botany 1 (or 12), 110A-110B; Forestry 114; Mathematics 3A-3B; Mineralogy 4A, 4B; Geology 1A, 103, 104A-104B; Philosophy 14; Physiology 100A-100B; Psychology 5, 160; Speech 1A-1B, 110A-110B; Zoölogy 4, 114.

### *Social Aspects*

*Group Major Adviser:* Mr. WILSON.

*Preparation for the Major.*—Economics 1A-1B, 40 or Psychology 5; Political Science 1-2; Psychology 1A; Zoölogy 1A or 10. Strongly recommended: Chemistry 1A-1B; Physics 2A-2B, 3A-3B; Psychology 1B or 2, 3; Speech 1A-1B, 2A-2B. Also recommended: Anthropology 1; Architecture 1; Journalism 20A-20B; Physiology 1A; Public Health 5A-5B.

*The Major.*—Political Science 167A-167B, 168A-168B, 169, 181; Psychology 160, 168; Social Welfare 101A-101B. Eight units selected from the following: Anthropology 150A-150B; Business Administration 120, 121, 125, 160A-160B; Economics 180, 185; Journalism 130A-130B; Mathematics 120A-120B; Physiology 104A; Political Science 117, 151, 154, 155, 162, 172, 183, 261A-261B, 267A-267B, 281A-281B; Psychology 109, 112, 145A-145B, 146, 148, 180, 185; Public Health 164; 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 153A-153B, 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, 171, Psychology 145A–145B. 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.

#### JURISPRUDENCE

*Prelegal Advisers:* Mr. W. W. FERRIER, JR., Mr. FRANK C. NEWMAN.

War veterans who enter the School of Jurisprudence as seniors in the fall semester, 1948, may receive the A.B. degree after one year, offering the first year of the law school curriculum in lieu of a major. Upon completing the

prescribed curriculum of the School of Jurisprudence, such students will be eligible for the LL.B. degree.

It should be particularly noted that after the fall semester, 1948, seniors will no longer be admitted to the School of Jurisprudence. All applicants will be required to present a bachelor's degree for admission. For full information respecting admission to the School of Jurisprudence, consult the ANNOUNCEMENT OF THE SCHOOL OF JURISPRUDENCE.

*Preparation for the Study of Law.*—The School of Jurisprudence has not prescribed a prelegal curriculum. It is prepared to give prelegal students specific advice concerning courses. For the guidance of all students who are looking forward to the study of law, 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 a broad culture.* Where practicable, 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) an introduction to Latin as the basis of modern language and the cultivation of at least one modern language other than English, to a point at which it may be used freely in reading; (3) a familiarity with at least the outlines of human history and a much more thorough knowledge of the history of our own country and people; (4) an acquaintance with the great philosophers and an understanding of the progress and significance of philosophic thought; (5) a mastery of elementary logic and mathematics and some acquaintance with their applications in contemporary life; (6) an introduction, at least, to science, particularly to chemistry and physics, and an appreciation of the tremendous importance of science in the modern world; and (7) 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, foreign language, history, mathematics, and science. The prelegal student will generally 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 during the high school period and the first two years of college.

In the second place, *the prelegal student should acquire the intellectual discipline and experience which is 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. The field is ordinarily described as a major and the work in this field may be expected to occupy a substantial part of the last two years of college. In general, it has been found that a well-planned major in economics may be related effectively to later professional study in the field of law. Majors in political science, philosophy, English, history, or other social studies, if carefully selected, may also provide a suitable preprofessional training. College courses in commercial, elementary, or business law, planned primarily for students who do not expect to study law, should not be included in any prelegal program.

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 the constant exercise of practice in writing should be cultivated assiduously. Intelligently selected private reading should supplement 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 professional school may be traced directly to the neglect of opportunities in school and college. Distinguished achievement in school and college is usually followed by distinction in the professional school and in later practice.

Students contemplating the study of law are invited to consult as early as possible with the Prelegal Adviser or with the Dean of the School concerning their programs of preparatory study. Appointments will be arranged by the Secretary of the School.

See also under Criminology.

#### 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. Not more than five students will be admitted to each first-year class from institutions of any state outside of California and of these five not more than one will be selected from a single state. 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 com-

plete 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 163A, 163B 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. On the next page is a suggested program.

## Undergraduate Departments

First Year			Second Year		
	Fall Units	Spring Units		Fall Units	Spring Units
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 .....	3	3	‡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	..
	<hr/>	<hr/>		<hr/>	<hr/>
	14	17		17	18

## 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 8	5 or 11
	<hr/>	<hr/>
	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.

\* For regulations concerning Subject A, see page 37; American History and Institutions, page 38.

† English: any 3 units in composition plus any 3 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.

*Preparation for the Group Major.*—High school chemistry or the equivalent, Public Health 5A (3), Physiology 1A-1C (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 35) (2); introduction to physical education (Physical Education 20) (1); and first aid (Physical Education 5A) (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.

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 1A, 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 the 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, 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 10A–10B; 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 148A, 148B; Spanish 100B, 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 the 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 the 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: Anthropology 181; 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 69), or may elect a suitable combination of courses under the General Curriculum (see page 62, 68).



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 10A-10B. Recommended: Music 30A; French 9A 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 40 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, 150A, 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 ensures a broad and sound training for students intending to qualify as biologists with national agencies such as the Forest Service, Park Service, Fish and Wildlife Service, Soil Conservation Service, Public Health Service, and with state agencies such as the divisions of Forestry, Fish and Game, and Public Health. The curriculum is broadly conceived, yet it is not superficial. Emphasis is placed upon the fundamental roots of professional biology and forestry which lie in the pure sciences, yet not without adequate illustration of the application of physical and biological principles. 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.

*Preparation for the Major.*—Lower Division. Required: Chemistry 1A, 8; Mathematics C or 3A; Botany 1 or 12; Zoölogy 1A-1B; Economics 40 or Public Health 163; Geology 1A; Engineering 1A. Recommended: Economics 1A-1B; Geography 1; Geography 4; Agricultural Economics 1; Agronomy 1.

*The Major.*—Required: Botany 108; Zoölogy 111 or 140, 113, 116, 125, 145; Forestry 101, 102, 103, 125; Entomology 114 or 133; Poultry Husbandry 106. Recommended: Geography 111, 153; Soil Science 100 or 101; Zoölogy 106.

#### 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.

NOTE.—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, 113.
- Anatomy. All undergraduate courses.
- Anthropology. All undergraduate courses.
- Architecture 5A, 5B, 5C, 5D, 6A, 6B, 6C, 6D, 14, 113, 114, 117, 120A, 120B.
- Art. All undergraduate courses.
- Astronomy. All undergraduate courses except 3, 11 and 114.
- Bacteriology. All undergraduate courses except 199 (Davis).
- Biochemistry. All undergraduate courses.
- Botany. All undergraduate courses.
- Business Administration 6A, 6B, 10, 107, 151.
- Chemistry. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149H.
- Classics. All undergraduate courses.
- Decorative Art. All undergraduate courses.
- Dramatic Art. All undergraduate courses except 20, 120, 190, 191, 192, 193.
- Economics. All undergraduate courses.
- Education 108, 110 and not more than 3 units from 101, 102, 105.
- English. All undergraduate courses.
- Entomology 1, 106, 112, 127, 129.
- Forestry 1, 103, 125.
- 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, 7, 10, 14, 101A, 101B, 102A, 102B, 103, 106, 120A, 120B, 132, 134, 142, 160, 190.
- Italian. All undergraduate courses.
- Journalism 20A, 20B, 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 eight units from the following courses will be accepted as Letters and Science credit: 25, 55 (formerly 15), 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 167A, 167B, 168A, 168B, 169, 183.
- Psychology. All undergraduate courses except 3, 104, 116, 117, 144, 185, 186.
- Public Health 5A, 5B, 21, 35, 160A, 160B.
- Public Speaking (see below under Speech).
- 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. Zoölogy. All undergraduate courses except 109 and 145.  
Speech. All undergraduate courses.

#### 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 honor 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 honors 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 honor 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 26-34. 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 37).
- (b) *Military or Naval Science* (for male students; see pages 39, 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 38).
- (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.

*Undergraduate Departments*

## (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
	<u>80 units</u>

(b) At least 15 units of upper division work in agricultural economics, selected with the approval of the major adviser.

CURRICULUM IN AGRICULTURAL EDUCATION  
(GENERAL AGRICULTURE)

(a) Chemistry .....	13 units
Botany .....	8
Bacteriology .....	4
Economics .....	6
Soil Science .....	3
Genetics .....	4
Physics .....	6
English .....	3
Zoölogy .....	5
Military Science .....	8
	<u>60 units</u>

(b) At least 50 units of work distributed in the fields of animal science, plant science, agricultural engineering, and agricultural economics, selected with the approval of the major adviser.

The CURRICULUM IN AGRICULTURAL ENGINEERING is offered in the College of Engineering. See page 106.

## (a) CURRICULUM IN ANIMAL SCIENCE

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
	<u>75 units</u>

\* This requirement is not satisfied by Mathematics A, B, C, D, G, or 2.

(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, dairy industry, veterinary science, and genetics.

(a) CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

Chemistry .....	13 units
Agriculture or Forestry, other than Entomology and Parasitology, but including Plant or Animal Pathology....	12
Botany and Zoölogy.....	20
Bacteriology .....	4
English or Speech.....	6
Genetics .....	3
Physics .....	3
Plant or Animal Physiology or Nutrition.....	6
Military Science .....	8
	<u>75 units</u>

(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.)

(a) CURRICULUM IN FOOD TECHNOLOGY

Chemistry .....	19 units
Microbiology (including Bacteriology 1).....	8
Botany and/or Zoölogy.....	8
Physics (with laboratory).....	8
Biochemistry and/or Physiology.....	6
Mathematics (including Differential Calculus).....	6
English and/or Speech.....	6
Military Science .....	8
	<u>69 units</u>

(b) At least 30 units of courses in food technology and allied subjects, selected with the approval of the major adviser.

(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
Zoölogy (General Biology).....	3
Speech, English, or Philosophy.....	6
Military Science .....	8
	<u>62 units</u>

\* 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 130.



(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.

CURRICULUM IN HOME ECONOMICS	
(a)	
Chemistry .....	8 units
Economics .....	6
Psychology .....	3
Bacteriology (including laboratory).....	4
Physiology .....	3
English or Speech.....	6
Public Health, Botany, or Zoölogy.....	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, 5, 7, 102A-102B, 132 (or Psychology 112), 133, 140, 141 (or 142), 144, 162, 167; Decorative Art 16A-16B, 130A; Architecture 110; Civil Engineering 125.

*Child Development Major:*

Home Economics 1A-1B, 102A-102B, 132 (or Psychology 112), 133, 134 (or Public Health 125), 135, 435; Psychology 160, 162; Physiology 102.

*Clothing and Textiles Major:*

Home Economics 5, 7, 141, 160, 162, 163, 167; Decorative Art 16A-16B, 175A-175B, 193A-193B.

*Family Economics Major:*

Home Economics 7, 100, 140, 141, 142, 144, 162; Civil Engineering 125; 6-9 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, 106, 120A-120B, 141 (or Agricultural Economics 101A or Business Administration 123); Chemistry 1B; Biochemistry 103; Physiology 1C; 4 units of food technology courses.

*Nutrition and Dietetics Major:*

Home Economics 1A-1B, 100, 101A, 106, 120A-120B, 141 (or Agricultural Economics 101A or Business Administration 123), 196; Chemistry 1B; Biochemistry 103; Physiology 1C.

## CURRICULUM IN LANDSCAPE DESIGN

(a)		
	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

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 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.)

## CURRICULUM IN PLANT SCIENCE

(a)		
	Chemistry, including Biochemistry.....	16 units
	Botany and Plant Physiology.....	12
	English or Speech.....	3
	Physics .....	6
	Bacteriology .....	4
	Economics .....	3
	Genetics .....	4
	Soils and/or Irrigation.....	6
	Plant Pathology .....	4
	Entomology .....	4
	Zoology .....	3
	Military Science.....	8

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 73 units

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

The plant science curriculum with majors in 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.

\* The following Decorative Art courses will be accepted in partial satisfaction of this requirement: 16A, 16B, 60A, 60B, and 166.

CURRICULUM IN SOIL SCIENCE	
(a)	
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. (Courses 100, 101, 110, and 111 should be included.)

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

#### CURRICULUM IN PREVETERINARY SCIENCE\*

1. English Composition and Speech or additional English.....	6 units
2. Chemistry (General, Qualitative Analysis, and Organic)....	13
3. Zoölogy (General Zoölogy and Embryology).....	10
(This requirement may be satisfied by Zoölogy 1A, 1B, and 100 at Berkeley.)	
4. Physics .....	6
(This requirement may be satisfied by Physics 2A and 2B at Berkeley.)	
5. A choice of electives from the following:	
Group 1. History, Literature, Philosophy, Speech.....	6
Group 2. Economics, Foreign Language, Political Science, Sociology .....	6
Group 3. Mathematics (including one course beyond trigonometry—statistics or biometry recommended) and free electives .....	13
(All units in mathematics obtained in college, including intermediate algebra (Mathematics D) and trigonometry (Mathematics C) may be counted in group 3.)	
	60 units

#### 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 of 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.

\* 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.

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</i>	<i>Spring</i>		<i>Fall</i>	<i>Spring</i>
	<i>Units</i>	<i>Units</i>		<i>Units</i>	<i>Units</i>
Military Science . . . . .	2	2	Military Science . . . . .	2	2
Chemistry 1A, 8 . . . . .	5	3	Business Adm. 6A-6B . . . . .	3	3
Economics 1A-1B . . . . .	3	3	Mathematics 11A-11B . . . . .	3	3
English 1A-1B or Speech 1A-1B . . . . .	3	3	Economics 40 . . . . .	3	3
Zoölogy 10 . . . . .	3	..	Agricultural Economics 1 . . . . .	3	..
Botany 12 . . . . .	..	4	Geology 1A . . . . .	3	..
			Truck Crops 1 . . . . .	..	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
Agronomy 1 . . . . .	3	..	Poultry Husbandry 1 . . . . .	3	..
Truck Crops 1 . . . . .	..	3	Zoölogy 1A . . . . .	4	..
Elective . . . . .	..	3	Chemistry 8 . . . . .	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	15	16		15	15

## ANIMAL SCIENCE

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science . . . . .	2	2	Military Science . . . . .	2	2
Chemistry 1A-1B . . . . .	5	5	Chemistry 8 . . . . .	3	..
Physics 2A-2B . . . . .	3	3	Bacteriology 2 . . . . .	..	4
English 1A . . . . .	..	3	Economics 1A-1B . . . . .	3	3
Geology 1A . . . . .	3	..	Zoölogy 1A-1B . . . . .	4	4
Poultry Husbandry 1 . . . . .	3	..	Botany 12 . . . . .	..	4
Elective . . . . .	..	3	Physiology 1A . . . . .	3	..
	<hr/>	<hr/>	Physiology 1C . . . . .	2	..
	16	16		<hr/>	<hr/>
				17	17

## Undergraduate Departments

## ENTOMOLOGY AND PARASITOLOGY

<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
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
Bacteriology 2 . . . . .	..	4	Physics 10 . . . . .	3	..
	<u>15</u>	<u>14</u>	Electives . . . . .	3	6
				<u>16</u>	<u>15</u>

## FOOD TECHNOLOGY

<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	..	Physics 3A-3B . . . . .	1	1
Zoölogy 10 . . . . .	..	3	Chemistry 8, 5 . . . . .	3	3
Truck Crops 1 . . . . .	..	3	Bacteriology 1 . . . . .	..	5
Speech 1A . . . . .	..	3	Mathematics 11A-11B . . . . .	3	3
Elective . . . . .	3	..	Elective . . . . .	3	..
	<u>15</u>	<u>16</u>		<u>18</u>	<u>17</u>

## PREFORESTRY

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science . . . . .	2	2	Military Science . . . . .	2	2
Chemistry 1A, 8 . . . . .	5	3	Physics 2A-2B . . . . .	3	3
Geology 1A . . . . .	3	..	Physics 3A-3B . . . . .	1	1
Speech 1A-1B or English 1A-1B . . . . .	3	3	*Engineering 1A-1B . . . . .	3	3
Zoölogy 10 . . . . .	..	3	Economics 1A-1B . . . . .	3	3
Mathematics 3A-3B or 11A-11B . . . . .	3	3	Botany 1 . . . . .	5	..
	<u>16</u>	<u>14</u>	Statistics . . . . .	..	3
				<u>17</u>	<u>15</u>

## †HOME ECONOMICS

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Chemistry 1A, 8 . . . . .	5	3	Physiology 1A . . . . .	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 5, 7 . . . . .	3	3
Electives . . . . .	3	4	Economics 40 or Psy- chology 5 . . . . .	..	3
	<u>16</u>	<u>16</u>	Elective . . . . .	..	4
				<u>15</u>	<u>16</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.

† 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.

## LANDSCAPE DESIGN

<i>Freshman Year</i>		<i>Sophomore Year</i>			
	<i>Fall Units</i>	<i>Spring Units</i>			
Military Science .....	2	2	Military Science .....	2	2
Botany 12 .....	4	4	Architecture 4 .....	4	4
Art 2A-2B or Decorative			Architecture 12 .....	1	..
Art 16A-16B .....	2	2	Architecture 18 .....	1	..
English 1A-1B or			Engineering 21 .....	8	8
Speech 1A-1B .....	3	3	Art 2A or Decorative Art		
Architecture 1, 2 .....	3	3	16A .....	2	..
Economics 1A-1B .....	3	3	Landscape Design 1A-1B.	3	3
Elective .....	3	..	Landscape Design 2 .....	2	..
			History 17A-17B .....	3	3
			Electives .....	3	2
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		17	17

## PLANT SCIENCE

<i>Freshman Year</i>		<i>Sophomore Year</i>			
Military Science .....	2	2	Military Science .....	2	2
Botany 1, 14 .....	5	4	Chemistry 8, 5 .....	3	3
Chemistry 1A-1B .....	5	5	Zoölogy 1A .....	4	..
Physics 2A-2B .....	3	3	Bacteriology 1 .....	5	5
Physics 3B .....	1	1	English 1A or Speech 1A ..	3	3
			Geology 1A .....	3	..
			Botany 102 .....	4	..
			Elective .....	3	3
	<hr/>	<hr/>		<hr/>	<hr/>
	15	15		16	16

## SOIL 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	English 1A-1B or Speech		
Physics 2A-2B .....	3	3	1A-1B .....	3	3
Physics 3A-3B .....	1	1	Geology 1A .....	3	..
Electives .....	2	6	Bacteriology 1 .....	5	5
			Mineralogy 4A .....	3	..
			Mathematics 3A-3B .....	3	3
	<hr/>	<hr/>		<hr/>	<hr/>
	18	17		17	16

## Undergraduate Departments

PREVETERINARY SCIENCE					
<i>Freshman Year</i>		<i>Sophomore Year*</i>			
	<i>Fall Units</i>	<i>Spring 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	Mathematics 12 . . . . .	..	3
Physics 2A-2B . . . . .	3	3	†Elective Group 1 . . . . .	3	3
†Elective Group 3 . . . . .	3	3	†Elective Group 2 . . . . .	3	3
			†Elective Group 3 . . . . .	3	..
	—	—		—	—
	16	16		15	18

## 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 honor status unless their average at the end of any semester falls below two grade points for each unit of credit undertaken.

*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 (3½ units), German or French (2 units). It is recommended also that solid geometry (½

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

† See Elective Groups, curriculum in Preveterinary Science, page 92.

unit), geometrical drawing, and further work in German or French be included. Students without 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 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 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. 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 curriculum 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 PROGRAMME.

*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.

*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. Students preparing for Chemical Engineering are advised to elect Engineering 22 and 23.

*Upper division.*—In addition to completing the specific requirements (a), (b) and (c) listed above, 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

\* For regulations concerning Subject A, see page 37.

in organic chemistry should include work in biochemistry, bacteriology, or physiology.

Students who wish to receive the B.S. in Chemistry (Chemical Engineering Curriculum) or who wish to proceed to the M.S. in Chemical Engineering, should confer with Professor Vermeulen, Room 104, Gilman Hall. The following upper division program is recommended for students electing the Chemical Engineering Curriculum:

## CHEMICAL ENGINEERING CURRICULUM

<i>Junior Year</i>			<i>Senior Year</i>		
	<i>Fall</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Chemistry 12B .....	5	..	Chemistry 104†, 144†, 146B .....	9	..
Chemistry 110B, 111.....	3	3	Chemistry 145A-145B ...	2	2
Chemistry 143, 146A.....	3	3	Metallurgy 152 (or 150A) .	2	..
Engineering 23, 35.....	5	..	Electrical Eng. 101.....	3	..
Mechanical Eng. 105A ...	..	3	Electives .....	..	11
Civil Eng. 108A .....	..	3			
Math. 110 (or 119A)*... ..	..	4			

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, 149H, 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 114; Metallurgy 102, 124; Civil Engineering 124, 111B, 109B; Petroleum Engineering 117, 119.

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

Courses in business fields: Economics 10, 1A-1B; Mechanical Engineering 120, 143; Business Administration 10, 18, 107, 120, 123, 127, 151; 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

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

† Chemistry 105 may be substituted for 104, and Chemistry 114H or Mechanical Engineering 154 may be substituted for Chemistry 144.

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 May 2. 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 completion 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 37).  
 Military Science (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–2), Public Health (5A–5B), Sociology and Social Institutions (10A–10B) ..... 12–14 units

\* The requirement of American History and Institutions is also prerequisite to the bachelor's degree, page 38.

† Course numbers in parentheses refer to courses given at the University of California, Departments at Berkeley.

- (b) Group II: *Either* (a) one year-course or year sequence in foreign literature in translation (French 9A-9B, German 9A-9B-9C), a year sequence of any foreign language, English (44A-44B, 46A-46B), Music (30A-30B), Philosophy (6A-6B, 10A-10B); or (b) any combination of two semester 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 of at least grade C, 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 38).

- |                                      |         |
|--------------------------------------|---------|
| (2) English or Speech (1A-1B*) ..... | 6 units |
| (3) Chemistry (1A, 8) .....          | 8       |
| (4) Biology (Zoölogy 1A-1B) .....    | 6-8     |

\* Course numbers in parentheses refer to courses given at the University of California, Departments at Berkeley.

(5) *Either* the Associate in Arts degree from the University of California (or its equivalent), *or* the following program of courses:

(a) A year-course selected from each of the following groups:

*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-2), 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 of the three groups listed under (a)..... 6

(c) Electives .....12-16

### COLLEGE OF ENGINEERING

*Matriculation requirements.*—A statement concerning matriculation requirements will be found on page 26. 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.

*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 15 for the spring semester. Petitions to change college may be secured from the office of the Dean, 220 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		Chemistry . . . . .	5
Mechanics . . . . .	6	Metallurgy . . . . .	18
Irrigation, Soil Science, Agronomy	13	Optional Subjects . . . . .	31
Agricultural Machinery and Structures . . . . .	17	<i>Mineral Exploration:</i> . . . . .	136
Optional Subjects . . . . .	18	Chemistry . . . . .	2
<i>Civil Engineering:</i> . . . . .	132	Dynamics . . . . .	3
Mechanics, Strength of Materials, Properties of Materials, Specifications . . . . .	9	Mineralogy, Geology, and Paleontology . . . . .	34
Hydraulic, Sewerage, Foundation, Structural, and Transportation Engineering . . . . .	14	Surveying and Map Drawing . . . . .	6
Optional Subjects . . . . .	29	Optional Subjects . . . . .	11
<i>Electrical Engineering:</i> . . . . .	132	<i>Mining Engineering:</i> . . . . .	134
Mathematics . . . . .	4	Chemistry . . . . .	2
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials . . . . .	6	Dynamics . . . . .	3
Electrical Circuits and Machinery . . . . .	22	Mineralogy and Geology . . . . .	18
Optional Subjects . . . . .	20	Mining . . . . .	10
<i>Engineering Physics:</i> . . . . .	128	Metallurgy . . . . .	5
Chemistry . . . . .	8	Analysis of Ores . . . . .	6
Physics . . . . .	8	Optional Subjects . . . . .	10
Mathematics . . . . .	4	<i>Petroleum Engineering:</i> . . . . .	134
Optional Subjects . . . . .	20	Chemistry . . . . .	8
Foreign Language . . . . .	8	Mechanics, Thermodynamics, Fluid Mechanics . . . . .	6
<i>Industrial Engineering:</i> . . . . .	134	Petroleum Technology and Economics . . . . .	16
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials . . . . .	10	Optional Subjects . . . . .	24
Electrical Circuits and Machinery . . . . .	5	<i>Process Engineering:</i> . . . . .	134
Business Administration . . . . .	15	Chemistry . . . . .	16
Optional Subjects . . . . .	24	Mathematics . . . . .	4
<i>Mechanical Engineering:</i> . . . . .	131	Heat Transfer and Unit Operations . . . . .	9
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials . . . . .	11	Unit Processes . . . . .	3
Mechanical Design and Manufacturing Processes . . . . .	10	Applied Thermodynamics and Fluid Mechanics . . . . .	3
Electrical Circuits and Machinery . . . . .	5	Optional Subjects . . . . .	19
Optional Subjects . . . . .	25		

*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. See page 39. 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 37.

(c) American History and Institutions. See page 38.

(d) Residence during the senior year. See page 41.

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 43.

(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 106–116). 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 E.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, and mechanical engineering 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 six units of upper division Military or Naval Science courses in place of the same number of elective units.*

#### PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Mathematics 3A-3B . . . . .	3	3	Mathematics 4A-4B . . . . .	3	3
Physics 4A . . . . .	4	4	Physics 4B-4C . . . . .	4	4
Chemistry 1A, 8 . . . . .	5	3	Engineering 40-41 . . . . .	3	4
Engineering 22, 23 . . . . .	2	2	Engineering 24 . . . . .	2	..
Engineering 1A . . . . .	3	3	Engineering 35 . . . . .	3	3
Military Science . . . . .	2	2	Agricultural Eng. 12 (not required of students en- tering with junior stand- ing) . . . . .	..	2
Elective (see above) . . . . .	3	..	Military Science . . . . .	2	2
			Elective . . . . .	3	..
	15	17		17	18
Eng. 48 (recommended) ..	1	..	* (Agricultural Eng. 49) ..	(6)	

\* Agricultural Engineering 49 (6 units, taken at Davis), a summer course, required, consists of a study of engineering problems on typical California farms. May be taken after sophomore year.

Junior Year		Senior Year (at Davis)		
	Fall Units	Spring Units	Fall Units	Spring Units
Mech. Eng. 105A-105B... 3	3	3	‡Agricultural Eng. 114... 3	..
Engineering Design 102B. 3	..	..	‡Agricultural Eng. 113... .. 4	..
Engineering Design 106 (or C.E. 107A) .....	..	4	‡Agricultural Eng. 115... 3	..
Civil Engineering 108A... 3	..	..	‡Agricultural Eng. 130... .. 1	..
Civil Engineering 108F.. 1	..	..	Mechanical Engineering 151 (or Physics 116)... 3	..
Electrical Eng. 100A-100B 3	3	3	Mechanical Eng. 152A (or Chemistry 109) .....	3
Electrical Eng. 104A-104B 1	1	1	‡Irrigation 120 .....	3
Mechanical Eng. 103 (or Civil Engineering 110). 3	..	..	Soil Science 106.....	4
Agricultural Econ. 118 (may be taken in senior year) .....	3	3	Agronomy 110 .....	3
Elective .....	3	3	Elective .....	3
	<hr/> 17	<hr/> 17		<hr/> 15 <hr/> 15

## Recommended:

Agricultural Eng. 6.....2

The curriculum in Agricultural Engineering is given in the College of Engineering with the coöperation of the College of Agriculture. Under the present plan a student may spend the first three years at the Berkeley or Los Angeles campuses (or the first two years in a junior college with the third year on the Berkeley or Los Angeles campuses). The last year and the summer field trip must be taken at Davis. The first three years are in fundamental and mechanical engineering, while at Davis the student takes courses in agricultural engineering, irrigation practice, soil technology, and general agriculture. The curriculum is designed to prepare the student to apply engineering principles in agricultural practice.

The courses given by the Division of Agricultural Engineering at Davis include the design, selection, operation, and maintenance of farm power and machinery equipment; 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. The irrigation and soil science courses 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, and laboratory and field practice in the operation of farming equipment.

The program outlined may be modified, with the approval of the Committee on Study Lists, to meet the needs of the student who is preparing for some special phase of agricultural engineering, such as rural electrification, pest control, and food processing.

‡ These courses include engineering economics, but Agricultural Economics 118 is recommended in addition. If Irrigation 120 is not offered in the fall semester, students should take Soil Science 110, an acceptable substitute for Soil Science 106.

## Undergraduate Departments

## PROGRAM OF STUDY IN CIVIL ENGINEERING

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Mathematics 3A-3B . . . . .	3		Mathematics 4A-4B . . . . .	3	3
Physics 4A . . . . .		4	Engineering 22, 23 . . . . .	2	2
Chemistry 1A-1B . . . . .	5	5	Physics 4B-4C . . . . .	4	4
Engineering 1A-1B . . . . .	3	3	Geology 1A . . . . .	3	..
Electives (see page 106) . . . . .	3	..	Engineering 35 . . . . .	..	3
Military Science . . . . .	2	2	Engineering 8 . . . . .	..	2
			Elective . . . . .	2	..
			Military Science . . . . .	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		16	16

## Junior Year

Engineering Design 102B . . . . .	3	..
Civil Engineering 108A . . . . .	3	..
Civil Engineering 107A . . . . .	3	..
Civil Engineering 110-161 . . . . .	3	2
Civil Engineering 108E . . . . .	2	..
Civil Engineering 108C . . . . .	1	..
Civil Engineering 135 . . . . .	2	2

NOTE.—Students in Sanitary and Municipal option take Civil Engineering 161 in senior year and Civil Engineering 111A in junior year.

## Senior Year

Civil Engineering 113 . . . . .	2	..
Civil Engineering 107C . . . . .	3	..
Civil Engineering 109A . . . . .	3	2
Civil Engineering 106 . . . . .	2	..
Electrical Engineering 101 . . . . .	..	3
Civil Engineering 111A . . . . .	2	..
Civil Engineering 116 . . . . .	..	2
Civil Engineering 108C . . . . .	1	..

(This program applies only to students who began their college work in 1945 or earlier. A revised program for other students will appear in the 1949-1950 GENERAL CATALOGUE.)

## Options for Junior Year

CONSTRUCTION		
Business Adm. 6A-6B . . . . .	3	3
Business Adm. 151 . . . . .	3	..
Business Adm. 153 . . . . .	..	3
Civil Engineering 133 . . . . .	..	3
	<hr/>	<hr/>
	17	17

## Options for Senior Year

CONSTRUCTION		
Mechanical Eng. 120 . . . . .	..	3
Business Adm. 127 . . . . .	3	..
Business Adm. 118 . . . . .	..	3
Business Adm. 161 . . . . .	..	3
Mechanical Eng. 105A . . . . .	3	..
Elective . . . . .	..	1
	<hr/>	<hr/>
	16	17

## IRRIGATION

Mechanical Eng. 105A . . . . .	..	3
Civil Engineering 102A . . . . .	3	..
Irrigation 102A . . . . .	..	2
Irrigation 103 . . . . .	2	..
Civil Engineering 133 . . . . .	..	3
Elective . . . . .	1	1
	<hr/>	<hr/>
	17	17

## IRRIGATION

Irrigation 101 . . . . .	..	2
Irrigation 102B . . . . .	2	..
Irrigation 104 . . . . .	..	2
Irrigation 112 . . . . .	2	..
Electives . . . . .	3	5
	<hr/>	<hr/>
	17	16

## Options for Junior Year (Continued)

SANITARY AND MUNICIPAL		
	Fall Units	Spring Units
Civil Engineering 125 . . . . .	2	..
Civil Engineering 123 . . . . .	4	..
Bacteriology 2 . . . . .	4	4
Zoölogy 109 . . . . .	1	1
Elective . . . . .	3	3
	—	—
	17	16

## STRUCTURAL

Mechanical Eng. 105A . . . . .	3	3
Civil Engineering 120 . . . . .	..	..
Civil Engineering 133 . . . . .	3	3
Electives . . . . .	4	2
	—	—
	17	16

## TRANSPORTATION

Mechanical Eng. 105A . . . . .	3	..
Civil Engineering 102A . . . . .	3	..
Civil Engineering 102B . . . . .	3	3
Astronomy 3 . . . . .	1	1
Civil Engineering 133 . . . . .	3	3
Electives . . . . .	2	2
	—	—
	17	17

## Options for Senior Year (Continued)

SANITARY AND MUNICIPAL		
	Fall Units	Spring Units
Civil Engineering 111B . . . . .	2	..
Civil Engineering 109B . . . . .	..	2
Civil Engineering 126 . . . . .	..	2
Irrigation 112 . . . . .	2	..
Mechanical Eng. 105A . . . . .	3	..
Electives . . . . .	..	6
	—	—
	17	17

## STRUCTURAL

Mechanical Eng. 120 . . . . .	3	..
Civil Engineering 107D . . . . .	..	3
Civil Engineering 114 . . . . .	..	3
Civil Engineering 108G . . . . .	..	2
Irrigation 112 . . . . .	2	..
Electives . . . . .	2	2
	—	—
	17	17

## TRANSPORTATION

Economics 170A . . . . .	3	..
Civil Engineering 108G . . . . .	..	2
Civil Engineering 107D . . . . .	..	3
Civil Engineering 104 . . . . .	2	..
Elective . . . . .	..	2
	—	—
	17	16

## PROGRAM OF STUDY IN ELECTRICAL ENGINEERING

## Freshman Year

Mathematics 3-4A . . . . .	6	3
Chemistry 1A-8 . . . . .	5	3
Physics 4A . . . . .	4	4
Engineering 22-23 . . . . .	2	2
Electives (see page 106) . . . . .	3	3
Military Science . . . . .	2	2
	—	—
	15	17

## Sophomore Year

Mathematics 4B-110 . . . . .	3	4
Physics 4B-4C . . . . .	4	4
Engineering 35 . . . . .	..	3
Engineering 42 . . . . .	4	..
Electives . . . . .	3	3
Military Science . . . . .	2	2
	—	—
	16	16

## Undergraduate Departments

<i>Junior Year</i>			<i>Senior Year</i>		
	<i>Fall</i>	<i>Spring</i>		<i>Fall</i>	<i>Spring</i>
	<i>Units</i>	<i>Units</i>		<i>Units</i>	<i>Units</i>
Electrical Eng. 110A-110B	3	3	Electrical Eng. 116A.....	3	..
Electrical Eng. 104A-104B	1	1	Electrical Eng. 113.....	..	2
Electrical Eng. 105-106..	3	4	Electrical Eng. 111A.....	3	..
Mech. Eng. 105A-105B...	3	3	Electrical Eng. 133.....	2	..
Mechanical Eng. 107....	..	3	Electrical Eng. 132A.....	2	..
Engineering Design 102B ..	..	3	Mechanical Eng. 120 or		
Civil Engineering 108A... 3	3	..	Business Adm. 107....	..	3
Civil Engineering 108F... 1	1	..	Electives .....	..	3
*English .....	3	..	Restricted Electives .....	7	9
			(see note below)		
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		17	17

NOTE.—Options in communications, illumination, industrial electronics and control, physics, and power may be arranged by proper choice of restricted electives. Lists of courses suggested are available in Room 220, Engineering Building. Combinations of electrical engineering with other engineering curricula and with curricula in chemistry, geology, and other sciences will also be approved for students with special interests in those fields. A combination with business administration is available for students interested in the commercial aspects of electrical industries. The program may, if desired, be pursued through graduate study leading to the degree of Master of Business Administration.

All elective courses must fit into a comprehensive plan that meets the approval of the Committee on Study Lists of the College of Engineering. Although postponement of required courses will make it difficult to complete the required work in eight semesters, in special cases certain elective courses should be taken in the junior year to satisfy prerequisites for elective senior courses. For this reason, it is desirable that a tentative selection of all elective courses be made as early as possible.

## PROGRAM OF STUDY IN ENGINEERING PHYSICS

<i>Freshman Year</i>		<i>Sophomore Year</i>	
Mathematics 3A-3B ....	3	Mathematics 14A-14B ..	5
Chemistry 1A-1B .....	5	Chemistry 8, 109 (or 5).	3
Physics 4A .....	4	Physics 4B-4C .....	4
Engineering 22-23 .....	2	Electives .....	3
Electives (see page 106).	3	Military Science .....	2
Military Science .....	2		
	<hr/>		<hr/>
	15		17
			<hr/>
			17

\* Speech 1A, English 1A or 41A, or other approved English course.

	Junior Year		Senior Year	
	Fall Units	Spring Units	Fall Units	Spring Units
Physics 105A-105B . . . . .	3	3	Physics 108B . . . . .	3
Physics 121 . . . . .	3	..	Mechanical Eng. 164 . . . . .	2
Physics 110A-110B . . . . .	3	3	Mechanical Eng. 120 . . . . .	3
Physics 112 . . . . .	3	..	Civil Engineering 108A . . . . .	3
Mechanical Eng. 103 . . . . .	..	3	§Restricted Electives . . . . .	10
†Foreign Language . . . . .	4	4		
Electives . . . . .	..	3		
	16	16	15	16

The engineering physics curriculum is given in the College of Engineering with the cooperation of the Physics Department. The purpose of this curriculum is to prepare students for positions requiring the industrial applications of physics. Students who complete this curriculum with a grade B average or better and who have selected the appropriate restricted electives will be prepared for graduate work in either physics or engineering.

It may be necessary in some cases to change the order of courses in the junior and senior years as set up in the program of study to allow the student to satisfy prerequisites for restricted electives in the senior year. The program outlined may be modified with the approval of the Committee on Study Lists to meet the needs of students in special cases.

## PROGRAM OF STUDY IN INDUSTRIAL ENGINEERING

Freshman Year		Sophomore Year			
Chemistry 1A, 8 . . . . .	5	3	Physics 4B-4C . . . . .	4	4
Mathematics 3A-3B . . . . .	3	3	Mathematics 4A-4B . . . . .	3	3
Physics 4A . . . . .	..	4	Engineering 24 . . . . .	2	..
Engineering 22-23 . . . . .	2	2	Engineering 40 . . . . .	3	..
Engineering 1A . . . . .	..	3	Engineering 41 . . . . .	..	4
*Engineering 48 . . . . .	1	..	Engineering 35 . . . . .	..	3
Electives (see page 106) . . . . .	3	..	Economics 40 . . . . .	3	..
Military Science . . . . .	2	2	Military Science . . . . .	2	2
	16	17		17	16
Junior Year		Senior Year			
Civil Engineering 108A . . . . .	3	..	Mechanical Eng. 145 . . . . .	..	3
Civil Engineering 108F . . . . .	1	..	Mechanical Eng. 107 . . . . .	3	..
Electrical Eng. 100A-100B . . . . .	3	3	Mechanical Eng. 113 . . . . .	2	..
Electrical Eng. 104A-104B . . . . .	1	1	Mechanical Eng. 120 . . . . .	..	3
Engineering Design 102B . . . . .	3	..	Mechanical Eng. 143 . . . . .	3	..
Mechanical Eng. 103 . . . . .	..	3	Mechanical Eng. 144 . . . . .	..	2
Mech. Eng. 105A-105B . . . . .	3	3	Business Adm. 107 . . . . .	3	..
(Continued on next page)		(Continued on next page)			

† Foreign language must be either 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.

§ 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.

\* Not required for students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year.

(Continued from preceding page)

	Fall Units	Spring Units
Engineering Design 106 . . . . .	4	4
Business Adm. 6A-6B . . . . .	3	3
	<hr/>	<hr/>
	17	17

(Continued from preceding page)

	Fall Units	Spring Units
Business Adm. 120 . . . . .	3	..
Business Adm. 127 . . . . .	..	3
Electives . . . . .	3	6
	<hr/>	<hr/>
	17	17

The industrial engineering curriculum is offered for those students who intend to enter fields of engineering which are closely related to management, or engage in activities, such as technical sales work, where a background of fundamental engineering training is desirable. The curriculum combines fundamental courses in engineering and business administration with specialized courses related to industrial engineering. Since the majority of students who graduate from this curriculum enter manufacturing plants, working in either industrial engineering or operating departments, it is recommended that they endeavor to obtain some experience in such plants during summer vacations.

Students ordinarily are not allowed to transfer to the Industrial Engineering curriculum after the beginning of the junior year.

## PROGRAM OF STUDY IN MECHANICAL ENGINEERING

*Freshman Year*

Mathematics 3A-3B . . . . .	3	3
Chemistry 1A-8 . . . . .	5	3
Engineering 1A . . . . .	..	3
Physics 4A . . . . .	..	4
Engineering 22-23 . . . . .	2	2
*Engineering 48 . . . . .	1	..
Electives (see page 106) . . . . .	3	..
Military Science . . . . .	2	2
	<hr/>	<hr/>
	16	17

*Sophomore Year*

Mathematics 4A-4B . . . . .	3	3
Physics 4B-4C . . . . .	4	4
Engineering 24 . . . . .	2	..
Engineering 40-41 . . . . .	3	4
Engineering 35 . . . . .	..	3
Electives . . . . .	3	..
Military Science . . . . .	2	2
	<hr/>	<hr/>
	17	16

*Junior Year*

Engineering Design 102B-106 . . . . .	3	4
Mechanical Eng. 103 . . . . .	..	3
Mech. Eng. 105A-105B . . . . .	3	3
Elec. Eng. 100A-100B . . . . .	3	3
Elec. Eng. 104A-104B . . . . .	1	1
Civil Engineering 108A . . . . .	3	..
Civil Engineering 108F . . . . .	1	..
Electives . . . . .	3	3
	<hr/>	<hr/>
	17	17

*Senior Year*

Mechanical Eng. 113 . . . . .	2	..
Mechanical Eng. 120 . . . . .	..	3
Mech. Eng. 124A-124B . . . . .	3	3
Mech. Eng. 131A-131B . . . . .	4	4
**Restricted Electives . . . . .	6	6
	<hr/>	<hr/>
	15	16

\* Not required for students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year.

\*\* Options in air conditioning and refrigeration, automotive, fluid mechanics (hydraulics), heat power, heat transfer and thermodynamics, industrial, marine, mechanical design, process, and preparation for graduate study may be arranged by the proper choice of restricted electives, subject to the approval of the Committee on Study Lists. A list of suggested options may be obtained at the Office of the Dean of the College of Engineering. A minimum of 5 units of approved senior courses in mechanical engineering must be included among the restricted electives.

## PROGRAM OF STUDY IN METALLURGY

## PHYSICAL METALLURGY

## PROCESS METALLURGY

## Freshman Year

	Fall Units	Spring Units		Fall Units	Spring Units
Mathematics 3A-3B . . . . .	3	3	Mathematics 3A-3B . . . . .	3	3
Physics 4A . . . . .	4	4	Physics 4A . . . . .	4	4
Chemistry 1A-1B . . . . .	5	5	Chemistry 1A-1B . . . . .	5	5
Engineering 22-23 . . . . .	2	2	Engineering 22-23 . . . . .	2	2
Electives (see page 106) . . . . .	3	..	Engineering 1A . . . . .	3	..
Military Science . . . . .	2	2	Military Science . . . . .	2	2
	<u>16</u>	<u>17</u>		<u>15</u>	<u>16</u>

## Sophomore Year

Mathematics 4A-4B . . . . .	3	3	Mathematics 4A-4B . . . . .	3	3
Physics 4B-4C . . . . .	4	4	Physics 4B-4C . . . . .	4	4
Metallurgy 2A . . . . .	3	..	Metallurgy 2A-2B . . . . .	3	3
Chemistry 110A . . . . .	3	3	Chemistry 110A . . . . .	3	3
Eng. 35 (or Physics 105A) . . . . .	3	3	Geology 1A . . . . .	3	..
Electives . . . . .	4	2	Mineralogy 4A-4B . . . . .	3	2
Military Science . . . . .	2	2	Military Science . . . . .	2	2
	<u>16</u>	<u>17</u>		<u>18</u>	<u>17</u>

## Junior Year

Chemistry 110B . . . . .	3	..	Engineering 35 . . . . .	3	3
Civil Eng. 108A-108F . . . . .	3	1	Chemistry 110B . . . . .	3	..
Engineering Design 102B or Physics 105B . . . . .	3	..	Electrical Engineering 101 . . . . .	3	3
Mechanical Eng. 103 . . . . .	3	3	Electrical Engineering 102 . . . . .	1	1
Metallurgy 150A-150B . . . . .	3	3	Geology 103-109 . . . . .	3	3
Metallurgy 102-106 . . . . .	2	2	Geology 106 . . . . .	3	..
Engineering 41 . . . . .	4	4	Mining 113 . . . . .	3	1
*Restricted Electives . . . . .	4	..	Metallurgy 108-106 . . . . .	3	2
Electives . . . . .	3	3	Metallurgy 150A-110A . . . . .	3	2
	<u>18</u>	<u>16</u>	Electives . . . . .	3	3
				<u>18</u>	<u>18</u>

\* 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.



		<i>Senior Year</i>			
	<i>Fall</i>	<i>Spring</i>		<i>Fall</i>	<i>Spring</i>
	<i>Units</i>	<i>Units</i>		<i>Units</i>	<i>Units</i>
Mechanical Engineering			Mechanical Engineering		
120 or Bus. Adm. 107.. ..		3	120 .....		3
Engineering Design 106			Civil Engineering 110....	3	..
or Physics 121 .....	4 or 3	..	Civil Engineering 108A....	..	3
Metallurgy 170A-170B ..	3	3	Mining 103 .....	3	..
Metallurgy 172 .....	2	..	Mining 105A .....	4	..
Electrical Engineering 101 ..	3	3	Metallurgy 112-114 .....	3	3
Electrical Engineering 102 ..	1	..	Metallurgy 110B .....	2	..
Electives .....	3	..	*Restricted Electives .....	..	2
*Restricted Electives .....	6 or 7	8	Electives .....	3	3
	<hr/>	<hr/>		<hr/>	<hr/>
	18	18		18	14

## PROGRAM OF STUDY IN MINERAL EXPLORATION

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Mathematics 3A-3B .....	3	3	Geology 1B .....	3
Physics 4A .....	..	4	Mathematics 4A-4B .....	3
Chemistry 1A-1B .....	5	5	Mineralogy 4A-4B .....	3
Engineering 22-23 .....	2	2	Engineering 1A-1B .....	3
Geology 1A .....	3	..	Physics 4B-4C .....	4
Military Science .....	2	2	Military Science .....	2
	<hr/>	<hr/>	Electives (see page 106) ..	3
	15	16		<hr/>
				18
				<hr/>
				17
<i>Junior Year</i>		<i>Senior Year</i>		
Metallurgy 2A .....	3	..	Engineering Design 102B. 3	..
Geology 102A-102B .....	2	2	Geology 116 .....	2
Geology 103-108 .....	4	2	Mechanical Eng. 103....	3
Geology 106 .....	3	..	Chemistry 109 .....	3
Engineering 35 .....	..	3	Civil Engineering 108A... 3	..
Mineralogy 103 .....	..	3	Electives .....	3
Mining 113 .....	..	1	Mining 111A-111B .....	3
Electrical Eng. 101.....	3	..	Mining 107A-107B.....	2
Electives .....	..	3		3
Mining 101 .....	..	3		<hr/>
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	15	17		17
				<hr/>
				15

*To be given during the summer*

Geology 118 (Summer course  
in advanced field work)..... 6

\* 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.

## PROGRAM OF STUDY IN MINING ENGINEERING

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Mathematics 3A-3B . . . . .	3	3	Geology 1A . . . . .	3	..
Physics 4A . . . . .	4	4	Mathematics 4A-4B . . . . .	3	3
Chemistry 1A-1B . . . . .	5	5	Mineralogy 4A-4B . . . . .	3	2
Engineering 1A-1B . . . . .	3	3	Metallurgy 2A-2B . . . . .	3	3
Engineering 22 . . . . .	2	..	Engineering 35 . . . . .	..	3
Military Science . . . . .	2	2	Mining 113 . . . . .	..	1
			Physics 4B-4C . . . . .	4	4
			Military Science . . . . .	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	15	17		18	18
<i>Junior Year</i>			<i>Senior Year</i>		
Engineering 23 . . . . .	2	..	Mechanical Eng. 103 . . . . .	3	..
Civil Engineering 108A . . . . .	..	3	Metallurgy 108-110A . . . . .	3	2
Electrical Engineering 101 . . . . .	..	3	Metallurgy 106 or 124 . . . . .	..	2
Electrical Engineering 102 . . . . .	..	1	Mining 103 . . . . .	3	..
Geology 102A-102B . . . . .	2	2	Mining 105A-105B . . . . .	4	4
Geology 103 . . . . .	3	..	Mining 109 . . . . .	2	..
Geology 106 . . . . .	3	..	Mining 107A . . . . .	2	..
Engineering Design 102B . . . . .	3	..	Electives . . . . .	..	7
Mechanical Eng. 105A . . . . .	3	..			
Mining 1 . . . . .	..	3			
Electives (see page 106) . . . . .	..	6			
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	16	18		17	15

## PROGRAM OF STUDY IN PETROLEUM ENGINEERING

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Mathematics 3A-3B . . . . .	3	3	Mathematics 4A-4B . . . . .	3	3
Physics 4A . . . . .	..	4	Physics 4B-4C . . . . .	4	4
Chemistry 1A-1B . . . . .	5	5	Engineering 23 . . . . .	2	..
Engineering 1A-1B . . . . .	3	3	Chemistry 5-8 . . . . .	3	3
Engineering 22 . . . . .	2	..	Engineering 35 . . . . .	..	3
Military Science . . . . .	2	2	†Restricted Electives . . . . .	3	2
			Military Science . . . . .	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	15	17		17	15
<i>Junior Year</i>			<i>Senior Year</i>		
Engineering Design 102B . . . . .	3	..	Mech. Eng. 105A-105B . . . . .	3	3
Mechanical Eng. 103 . . . . .	..	3	Petrol. Eng. 121A-121B . . . . .	3	3
Civil Engineering 108A . . . . .	..	..	Petrol. Eng. 123A-123B . . . . .	3	3
Electrical Engineering 101 . . . . .	..	3	Petroleum Eng. 127-125 . . . . .	2	3
Petroleum Eng. 117-119 . . . . .	2	2	†Restricted Electives . . . . .	4	2
†Restricted Electives . . . . .	5	6	Electives . . . . .	3	3
Electives (see page 106) . . . . .	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		18	17

† Restricted electives are chosen from a group of 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

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Mathematics 3A-3B . . . . .	3	3	Mathematics 4A-4B . . . . .	3	3
Chemistry 1A-1B . . . . .	5	5	Physics 4B-4C . . . . .	4	4
Engineering 22-23 . . . . .	2	2	Engineering 42 . . . . .	4	..
Engineering 48 . . . . .	1	..	Chemistry 5 . . . . .	..	3
Physics 4A . . . . .	..	4	Chemistry 12A . . . . .	5	..
Military Science . . . . .	2	2	Engineering 35 . . . . .	..	3
Electives (see page 106) . . . . .	3	..	Military Science . . . . .	2	2
			Elective . . . . .	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		18	18
<i>Junior Year</i>			<i>Senior Year</i>		
Civil Engineering 108A . . . . .	3	..	Mechanical Eng. 154 . . . . .	..	3
Chemistry 109 . . . . .	3	..	Mechanical Eng. 151 . . . . .	3	..
Mechanical Eng. 105A . . . . .	3	..	Mech. Eng. 152A-152B . . . . .	3	3
Mechanical Eng. 105B . . . . .	..	3	*Engineering Design . . . . .	..	3
Electrical Eng. 101 . . . . .	3	..	Chemistry 147 . . . . .	..	3
Mechanical Eng. 107 . . . . .	..	3	Mechanical Eng. 120 . . . . .	3	..
Mechanical Eng. 103 . . . . .	..	3	Restricted Electives . . . . .	3	..
Metallurgy 150A . . . . .	3	..	Mechanical Eng. 131B . . . . .	4	4
Mathematics 110A-110B . . . . .	2	2			
Electives . . . . .	..	6			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		16	16

NOTE.—Options in heat and thermodynamics, fluid mechanics, design, food technology, and preparation for graduate study may be arranged by the proper choice of restricted electives subject to the approval of the Committee on Study-Lists of the College of Engineering. Lists of suggested courses for this option may be obtained in Room 220, Engineering Building.

### Ceramics Engineering

Instruction in ceramics engineering will be offered in the Colleges of Engineering, the program at Berkeley emphasizing the exploitation of California raw materials while that at Los Angeles will be directed toward the problems encountered in ceramics 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.

### Transportation and Traffic Engineering

The College of Engineering has recently been authorized to enlarge its offerings in the field of transportation and traffic engineering particularly as related to the highway system. It is expected that instruction in this field will be amplified beyond the present offerings in civil engineering in the very near future.

\* During 1948-1949 this requirement will be satisfied by a special section of Mechanical Engineering 198A or Mechanical Engineering 198B.

### Degree of Master of Business Administration

Students with a B.S. degree in Engineering, curriculum in Industrial Engineering, may receive the M.B.A. degree by completing approximately one year of graduate study which is administered jointly by the School of Business Administration and the Department of Engineering. Graduates of other engineering curricula may usually complete the work for this degree in three semesters if they select the proper elective courses during their undergraduate study. Applicants should consult an industrial engineering adviser in the Department of Engineering, or the Dean of the School of Business Administration.

### 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, or by examination, or both, at the discretion of the Admissions Committee. 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 Office of the Dean of the College of Pharmacy, Medical Center, San Francisco 22, California.

*Matriculation requirements.*—Requirements for admission to the academic departments of the University will be found on pages 26-34. 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. It is recommended that applicants present credit in Subject A (English composition); English, 4 units; history, 1 unit; Latin, 1 unit; German or French, 2 units; biology, 1 unit; in addition, a year of freehand drawing is recommended.

*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)

	<i>Fall</i> Units	<i>Spring</i> Units
Zoölogy 1A-1B .....	4	4
Botany 12 (or equivalent) <sup>1</sup> .....	..	4
Chemistry 1A-1B .....	5	5
English 1A-1B or Speech 1A-1B.....	3	3
Mathematics <sup>2</sup> .....	3	..
Military Science .....	2	2
Subject A (English Composition).....	..	..
	17	18

Dr. John J. Eiler, pharmacy adviser 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.

## 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 curri-

<sup>1</sup> Botany 1 or the first semester of the freshman course in college botany may be substituted for Botany 12.

<sup>2</sup> 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 1 or 3A, 2 or 11A.

culum 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.

<i>Freshman Year</i>	<i>Fall</i> Units	<i>Spring</i> Units	<i>Sophomore Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
Subject A (see page 37) . . . . .		..	Military Science . . . . .	2	2
American History and Institutions (see page 38) . . . . .		..	Mathematics 4A . . . . .	3	..
Military Science . . . . .	2	2	Engineering 18A . . . . .	..	3
<sup>2</sup> Mathematics 3A-3B . . . . .	3	3	<sup>2</sup> Architecture 5A-5B, 6A-6B . . . . .	3	3
<sup>2</sup> Physics 2A-2B . . . . .	3	3	Architecture 3-4 . . . . .	3	4
Physics 3A-3B . . . . .	1	1	Architecture 12 . . . . .	1	..
<sup>3</sup> Year Course . . . . .	3	3	Architecture 13 . . . . .	..	1
Architecture 1-2 . . . . .	3	3	<sup>1</sup> Foreign Language . . . . .	4	4
Architecture 18 . . . . .	..	1			
Art 2A . . . . .	2	..			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	16		16	17

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).

Besides the prescribed curriculum, 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, pages 62-69).

The degree of Master of Arts will be recommended for students of the School who have been in residence for at least one year after obtaining the A.B. degree, who have completed the prescribed curriculum for the first graduate year with an average grade of B or better, who have been duly advanced to candidacy, and who have passed the comprehensive final examination.

NOTE.—Students expecting to follow architecture as a profession must have received the M.A. degree in order to be recommended to the Licensing Boards of the various states. (See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.)

The degree of Graduate in Architecture will be recommended for students in

<sup>1</sup> See requirement (b), 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.)

<sup>2</sup> See requirement (c), College of Letters and Science.

<sup>3</sup> See requirement (e), College of Letters and Science.

the School who have been in residence for at least two years after obtaining the A.B. degree, who have completed the prescribed curriculum for the first and second graduate years with the average grade of B or better, including the thesis, and who have been duly advanced to candidacy.

## PRESCRIBED CURRICULUM

<i>Junior Year</i>			<i>Senior Year</i>		
	<i>Fall</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Engineering 21 .....		3	Civil Eng. 107E-107F . . .	3	3
Engineering 18B .....	3	..	Civil Engineering 108F . . .	..	1
Civil Engineering 112 . . .	..	2	Architecture 102A-102B . .	5	5
Architecture 101A-101B . .	5	5	Architecture 108A-108B . .	3	3
Architecture 5C .....	2	..	Architecture 112 .....	..	1
Architecture 6C .....	1	..	Architecture 114 .....	2	..
Architecture 12 .....	1	..	Electives .....	3	3
Architecture 13 .....	1	..			
Architecture 14 .....	..	2			
Architecture 115 .....	..	1			
Electives .....	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		16	16

*First Graduate Year*

	<i>Fall</i> Units	<i>Spring</i> Units
Architecture 200 .....	5	..
Architecture 201A .....	1	..
Architecture 201B .....	..	7
Architecture 207 .....	3	..
Architecture 208 .....	..	3
Architecture 209 .....	..	2
Electives .....	3	..
Comprehensive Final Examination .....	..	..
	<hr/>	<hr/>
	12	12

*Second Graduate Year*

Architecture 202 .....	7	..
Electives (to be arranged) .....	..	..
Thesis for the degree of Graduate in Architecture .....	..	..
	<hr/>	<hr/>
	7	..

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 written 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 term 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 must have maintained a scholarship average of at least grade C in the courses taken during the period of study in the School of 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 40 (Elementary Statistics).....	3
Mathematics 2 (Mathematics of Finance and Business)	3
(See page 121 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 6A-6B (Accounting) .....	6
Business Administration 18, 118 (Commercial Law) ...	6
Business Administration 107 (Economics of Enterprise)	3
Business Administration 108 (Business Fluctuations and Forecasting) .....	3
Business Administration 120 (Business Organization and Management) .....	3
Business Administration 123 (Marketing) .....	3
Business Administration 134 (Corporation Finance)...	3
Business Administration 151 (Industrial Relations) ...	3
	30 units

## B. A semester course from one of the following courses:

Economics 135 (Money and Credit)	
Economics 143 (Economics of Insurance)	
Economics 170A (Inland Transportation)	
Economics 190A (International Economic Relations)	
Business Administration 180 (Introduction to Real Estate and Urban Land Economics) .....	3

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 Economics Department, (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 38 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, 207 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. Application for supervised teaching must be made during the semester preceding enrollment in Education 320C.

*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 124.

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

## NOTE:—

(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).

NOTE.—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) Home Making
- (7) Librarianship
- (8) Life Science
- (9) Mathematics
- (10) Music
- (11) Physical Education
- (12) Physical Science
- (13) Social Studies\*

*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.,

\*\* 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.

† 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.

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 124–125.

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.

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 126).

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, Sec- tion 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 124.

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 courses in education enumerated on the next page.

## For the General Elementary Credential:

	Units
Education 110 (educational psychology) .....	3
Education 130 (elementary education) .....	3
Education 111 (growth and development of children) .....	2
Education 132 (art and music in the elementary school) .....	2
Education 131 (special problems of teaching in the elementary school) .....	2
Education 134 (reading and literature in the elementary school) .....	2
Education 138 (social studies in the elementary school) .....	2
Education 320A (supervised teaching—introduction to teaching) .....	1
Education 320C (supervised teaching) .....	3
Education 320E, Section 15 (supervised teaching—methods of teaching) .....	2
Education 321 (supervised teaching—materials of instruction and class management) .....	2
Total .....	24

5. He must complete, with a scholarship average of at least one grade point, a major and a 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.
- (l) 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 require-

\* 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."

† 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).



ments 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.

*For the General Junior High School Credential:*

The student must have the courses specified above for the general elementary credential and in addition the following course with a scholarship average of not less than one grade point:

Junior High School Education—Education 172..... 2 units

### 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.
- 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
<b>Total</b> .....	<b>54</b>

- 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.

Minor shortages in the subject requirements may be waived by the Study-List Committee of the School of Forestry if the committee feels that the candidate can successfully proceed with the normal program of study in the School.

**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.
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, under-

graduate 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.

#### Freshman Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chemistry 1A .....	5	Chemistry 8 .....	3
Geology 1A .....	3	Zoölogy 10 .....	3
Speech 1A or English 1A .....	3	Speech 1B or English 1B .....	3
Mathematics 3A or 11A .....	3	Mathematics 3B or 11B .....	3
Military Science .....	2	Military Science .....	2
	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
	17		15

† 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).

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	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
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
		Elective .....	3
	16		16 or 17

## Senior Year

FALL SEMESTER		SPRING SEMESTER	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
Forestry 104 .....	4	Forestry 120 .....	4
Soil Science 100 .....	4	A course in economics .....	3
Zoölogy 116 or Entomology 114.	3	Elective .....	9
Elective .....	6		
	17		16

The student specializing in range management must include in his 30 units of forestry at Berkeley, Forestry 101 and Forestry 102 (in the junior year) 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**

#### **Law School Admission Test**

The School of Jurisprudence is now cooperating with the Educational Testing Service (College Entrance Examination Board) 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 136.

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.

\* The privilege hitherto accorded veteran applicants who are eligible for admission to senior standing in the University of California and are otherwise qualified for admission to the professional curriculum will be continued through the opening of the fall semester of 1948 but will be terminated thereafter.

**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 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, 1949, the initial application must be received by the School not later than May 1, 1949. Actual receipt of the initial application by the School is the applicant's responsibility. 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 (College Entrance Examination Board), 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.).

\* Applications for admission in 1948 closed May 1, 1948. The procedure herein applies to the class entering in the fall semester of 1949.

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. 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 77).

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, 1949, first-year class may be filed between October 1, 1948, and December 31, 1948, but no application blanks will be issued by the Admissions Office after December 15, 1948. 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, 1949, 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, 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. This course is in the form of a practical apprenticeship, which consists of twelve months of full-time work, and covers training in biochemistry, parasitology, mycology, medical bacteri-

ology, serology, medical microscopy, histological technic, basal metabolism, and electrocardiography. Upon satisfactory completion of the course, the student receives a certificate in laboratory technic, and is eligible for the State Examination and the National Registry Examination.

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.

For further information, write to the Supervisor of Field Services, Medical Technicians' Curriculum, University of California Medical School, San Francisco 22, California.

#### PHYSICAL THERAPY

The curriculum in physical therapy is given at the Medical School of the University of California in San Francisco, and covers a period of one year, divided into two semesters and two summer sessions of six weeks each. The fall and spring semesters include all theory, seminars, and demonstration. The summer sessions are devoted to practical training which is completed in the Department of Physical Medicine at the University of California Hospital and at other hospitals. A certificate or a degree is issued when the course has been satisfactorily completed.

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. (Biological science includes general biology, anatomy, physiology, zoölogy, kinesiology, bacteriology. Physical science includes chemistry and physics.) 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 fulfill the general undergraduate requirements 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.

An applicant for admission must present transcripts of record 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 2A-2B, 3A-3B. 8 units or 8 semester hours (general physics)  
 Anatomy 102 . . . . . 3 units or 3 semester hours (general human anatomy)  
 Physiology 1A, 1C. . . . . 5 units or 5 semester hours (introductory physiology)  
 Psychology 168 . . . . . 3 units or 3 semester hours (abnormal psychology)

For further information, write to the Director of the Curriculum in Physical Therapy, University of California Medical School, San Francisco 22, California.

#### X-RAY TECHNICIANS

A year course for X-ray technicians is given at the University of California Hospital and the Langley Porter Clinic.

*Admission.*—The minimum prerequisite is graduation from high school. Preference will be given to graduate nurses and to students with university training, especially those having training in physics (equivalent to Physics 2A-2B), and anatomy (equivalent to Anatomy 102).

Women students are preferred, but men are not excluded.

Acceptance in the course is made after personal interview with the director.

*Curriculum.*—A student technician spends from 8:30 A.M. to 4:40 P.M. each day in the various divisions of the X-ray Department, so that when he has completed his course, he is able to do any part of the work demanded of an X-ray technician. This includes training in taking all kinds of X-ray films, working in the fluoroscopic room, filing room, darkroom, dental department, and in therapy. There are weekly lectures and seminars.

*Certificate.*—A certificate of completion of the curriculum will be given at the end of the course.

For further information, write to the Director, X-Ray Technicians' Course, Division of Radiology, University of California Medical School, San Francisco 22, California.

### SCHOOL OF NURSING

The School of Nursing offers three curricula leading to the bachelor's degree and certificates of completion in nursing, public health nursing, and nursing education.

#### UNDERGRADUATE CURRICULUM

The undergraduate curriculum is designed to prepare young women for participation in community health programs.

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 65 of this bulletin.

Enrollment in the School of Nursing is limited, and candidates for admission are accepted on the basis of scholarship in the pre-nursing 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 course 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</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Subject A .....	..	..	Physiology 1A and 10 .....	5	..
Chemistry 1A .....	5	..	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	5			
	15	15		15	15

The American History and Institutions examination, or courses in satisfaction of the requirement, should be completed. See page 38.

For information concerning the program in the School of Nursing see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

#### CURRICULA FOR GRADUATE NURSES

##### *Public Health Nursing and Nursing Education*

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

‡ Must include foreign language if necessary to satisfy Associate in Arts requirements.

in a school of nursing other than that of the University of California will be accepted in partial satisfaction of this requirement.

The final year must be spent in study in the academic departments of the University of California.

The first two years are spent in satisfying the requirements for the degree of Associate in Arts in the College of Letters and Science or the College of Applied Arts. The degree of Associate in Arts is required prior to admission to professional courses and specialization. The requirement of 60 units of work beyond the degree of Associate in Arts may be met in part by credit for work taken in an accredited school of nursing prior to entrance to the University. Not more than 30 units may be so credited. The remainder of the units may be obtained in one of several fields of specialization: public health nursing, nursing administration, and supervision and teaching of nursing.

The following program leading to the degree of Associate in Arts is suggested for graduate nurses:

SUGGESTED LOWER DIVISION PROGRAM FOR THE  
DEGREE OF ASSOCIATE IN ARTS

(For graduates of approved schools of nursing)

*First Year*

	<i>Fall</i> Units	<i>Spring</i> Units
Subject A (English Composition).....	..	..
Foreign Language .....	4	4
*Natural Science .....	5	5
English or Speech (year course).....	3	3
Year Course .....	3	3
	15	15

†*Second Year*

Psychology 1A .....	3	..
Natural Science .....	4	..
Year Course .....	3	3
‡Electives .....	5	12
	15	15

\* Chemistry 1A (5), Physiology 1A, 10 (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 65.

‡ Must include foreign language if necessary to satisfy Associate in Arts requirements.

PROGRAM IN THE SCHOOL OF NURSING LEADING TO THE  
DEGREE OF BACHELOR OF SCIENCE

*§Third Year*

	Mini- mum Fall Units	Maxi- mum Spring Units		Mini- mum Fall Units	Maxi- mum Spring Units
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			Public Health Nursing . . . . .	3	3
Nursing . . . . .	1	2	Child Hygiene . . . . .	2	3
Psychiatric Nursing . . . . .	1	2	Child Psychology . . . . .	2	3
Pharmacology . . . . .	1	2	Principles of Health		
Principles and Practice of			Teaching . . . . .	1	3
Nursing . . . . .	2	3	Professional Adjustments		
Pathology . . . . .	1	2	of Graduate Nurse . . . . .	1	3

*Fourth Year*

General Requirements

Education (including one course in Educational

    Psychology) . . . . . 5 units

Socio-Economics (including Social Welfare 100) . . . . . 5 units

‡American History and Institutions . . . Courses or Examinations

Major in Nursing Education

	Units
Nursing 432 . . . . .	2
Nursing 434 . . . . .	3
Electives . . . . .	15

Major in Public Health Nursing

	Units
Public Health 145 . . . . .	3
Public Health 105 . . . . .	3
Education 151 or 152 . . . . .	2
Nursing 416 . . . . .	3
Nursing 418-419 . . . . .	6
Electives . . . . .	3

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.

§ 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.

‡ 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 38.

### 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 based upon 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 of Completion 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 will be required to take a professional aptitude test beginning with the class entering in September, 1949.

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 Director of Admissions by May first 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.

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. The Degree of Bachelor of Science will be awarded upon satisfactory completion of the entire program with the necessary grade points. The details of the graduate year and the requirements for the Certificate of Completion in Optometry and the Master of Optometry degree will be announced later. For further information see the ANNOUNCEMENT OF THE SCHOOL OF OPTOMETRY.

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall</i>	<i>Spring</i>		<i>Fall</i>	<i>Spring</i>
	<i>Units</i>	<i>Units</i>		<i>Units</i>	<i>Units</i>
<sup>1</sup> 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	8	Anatomy 102 .....	..	8
Mathematics 3A .....	..	3	Psychology 1A-2 .....	3	3
<sup>2</sup> Elective .....	0 or 3	0 or 2	Bacteriology 2 .....	..	4
			<sup>3</sup> Elective .....	2 or 4	0 or 2
	<hr/>	<hr/>		<hr/>	<hr/>
	14 or 15	15		15	16
 <i>Junior Year</i>			 <i>Senior Year</i>		
<sup>2</sup> American History and			Optometry 101 .....	3	..
Institutions .....	..	..	Optometry 103A-103B...	3	3
Physiology 115 .....	3	..	Physiological Optics 105A-		
Physics 108A-108B			105B .....	3	3
(Sec. 2) .....	3	3	Physiological Optics 106A-		
Optometry 102A-102B...	3	4	106B .....	1	1
Optometry 401A-401B ..	2	2	Optometry 404A-404B ...	3	3
Physiology 110A-110B ...	3	3	Optometry 406A-406B ...	1	1
Elective .....	2	3	Optometry 407A-407B ...	2	1
			Elective .....	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	16	15		16	15

*Summer Session Program*

Optometry 410 .....

<sup>1</sup> An examination in Subject A (English Composition) is required of all undergraduate entrants. For further regulations concerning Subject A, see page 37.

<sup>2</sup> See Associate in Arts degree requirements, College of Letters and Science, as described on page 65.

<sup>3</sup> Required of all candidates for the bachelor's degree; see page 38.

## 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 37.)

Military Science and Tactics (men). (See page 39.)

(2) *Preparation for the Major.*

Public Health 5A-5B.

Bacteriology 2.

Chemistry 1A.

Physiology 1A-1C or Zoölogy 1A or 10.\*\*

Psychology 1A.

At least 6 units from:\*

English 1A, 1B.

Journalism 20A, 20B.

Speech 1A, 1B.

At least 6 units from:

Anthropology 2A, 2B.

Economics 1A, 1B.

Geography 1, 2.

Mathematics 3A, 3B.

Sociology and Social Institutions 1, 2.

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 6A-6B.

Business Administration 18.

Political Science 1.

*Public Health Education*

Public Health 35.

Chemistry 8.

Physical Education Activities (2 units).

*Public Health Sanitation*

Chemistry 1B, 8.

Physics 2A-2B, 3A-3B.

*Public Health Statistics*

Mathematics 3A-3B.

\* Sanitarions are required to complete at least 3 units from this group instead of 6.

\*\* Zoölogy 10 not acceptable for laboratory or public health education major programs.

## 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 38.)

## The Majors

(1) *Laboratory (Clinical and Public Health)*

Public Health 105, 147A, 150A-150B, 162.  
 Bacteriology 101.  
 Biochemistry 103.  
 Entomology 117.  
 Zoölogy 140.  
 Electives<sup>2</sup> and general University requirements<sup>1</sup>

(2) *Preadministration*

Public Health 105, 108, 110, 135, 145, 147A, 152, 162, 170, 187.  
 Business Administration 120.  
 Economics 143, 185.  
 Psychology 145A, 185.  
 Sociology and Social Institutions 141, 142.  
 Electives<sup>1</sup>

(3) *Public Health Education*

Public Health 105, 111, 131, 134, 135, 147A, 152, 162.  
 Education 106 or 107, 110, 151, 152.  
 Home Economics 102A or 103.  
 One course from:  
 Public Health 125.  
 Education 111.  
 Home Economics 134.  
 Psychology 112.  
 Six units from:  
 Upper division psychology.  
 Electives<sup>1</sup>

(4) *Public Health Sanitation*

Public Health 105, 111, 113A-113B, 114, 145, 147A, 152, 153, 162, 170.  
 Entomology 126.  
 Twelve units from either (A) or (B):

<sup>1</sup> The American History and Institutions requirement must be satisfied before graduation. (See page 38.)

<sup>2</sup> 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 aspects:

Public Health 112, 131, 186.  
 Civil Engineering 123, 124.  
 Food Technology 112A, 112B.  
 Political Science 181, 183.  
 Zoölogy 109.

## B. For students interested in the physical science aspects:

Civil Engineering 108A<sup>1</sup>, 123, 124.  
 Engineering 23, 35.  
 Engineering Design 102B.  
 Mathematics 4A, 4B.  
 Mechanical Engineering 103<sup>2</sup>, 105<sup>2</sup>.

Electives<sup>1</sup>.

(5) *Public Health Statistics*

Public Health 105, 135 or Anatomy 102, 147A, 152, 160A, 160B, 161A, 161B, 169.

At least 12 units from:

Other upper division public health courses.

At least 10 units from any:

Genetics course.

Sociology course.

Mathematics course.

Agricultural economics course.

Electives<sup>2</sup>.

## 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. degree in the field of public health laboratory, public health statistics, and public health sanitation who does not have a doctoral degree must have com-

<sup>1</sup> The American History and Institutions requirement must be satisfied before graduation. (See page 88.)

<sup>2</sup> Prerequisite, Mathematics 4A-4B.

pleted 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, in which an average of not less than two grade points per unit has been maintained. Those electing to do so may 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 student's supervisory 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 complete at least one academic year in residence at the University of California. The program must include advanced specialization in the particular field of public health for which the student is preparing.
- (2) The candidate must give evidence of 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 receive the approval of a special committee in charge of the dissertation, to be appointed by the Dean of the School of Public Health with the approval of the Graduate Council, and must be 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.

- (3) The candidate must demonstrate ability for practical leadership in his field, either
- (a) By providing evidence of 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).
    - 3. Economics 150A (labor economics) or some other course in social economics, such as Economics 150B (labor economics), Economics 180 (the problems of poverty), or Economics 185 (social insurance).

*Undergraduate Departments*

4. Psychology 160 (mental deficiency) or some other course in clinical or abnormal psychology.
5. Economics 40 (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 82, 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, or 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, or 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. 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 first 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 departmental 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 graduate scholarships and fellowships, 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 the several degrees of Master of Science, Master of Arts, Master of Business Administration, Master of Criminology, Master of Dental Surgery, Master of Education, Master of Engineering, Master of Forestry, Bachelor of Library Science, Master of Library Science, 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 1948-1949

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 restric-

tions 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 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) *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.

Vet Sci III II Dameran  
Vet Sci 2006 II Hart

Zool 10 II Hildebrand

Zool 100a II "

Zool 104 II Rosenberg

" 107 II "

## AGRICULTURE†‡

- 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.  
 LEON D. BATCHELOR, Ph.D., Professor of Horticulture, Riverside.  
 MURRAY R. BENEDICT, 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).  
 ALFRED M. BOYCE, Ph.D., Professor of Entomology, Riverside.  
 FRED N. BRIGGS, Ph.D., Professor of Agronomy, Davis.  
 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.  
 WALTER H. DORE, B.S., Professor of Plant Nutrition.  
 JOHN E. ECKERT, Ph.D., Professor of Entomology, Davis.  
 HENRY E. ERDMAN, Ph.D., Professor of Agricultural Economics.  
 EDWARD O. ESSIG, M.S., Professor of Entomology (Chairman of the Division).  
 STANLEY B. FREEBORN, Ph.D., 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.  
 HAROLD R. GUILBERT, M.S., Professor of Animal Husbandry, Davis.

† Herein are described the courses in the Department of Agriculture to be given at Berkeley, fall and spring semesters, 1948-1949, 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 1948-1949, 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.

\* In residence spring semester only, 1948-1949.

- 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.  
 DENNIS R. HOAGLAND, M.A., Professor of Plant Nutrition (Chairman of the Division).  
 ROBERT W. HODGSON, M.S., Professor of Subtropical Horticulture, Los Angeles.  
 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.  
 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.  
 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.  
 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.  
 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.  
 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).

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

Howard S. Fawcett, died December 12, 1948.

William B. Herms, died May 9, 1949.

- H. EARL THOMAS, Ph.D., Professor of Plant Pathology.
- <sup>2</sup> JAMES M. TINLEY, Ph.D., Professor of Agricultural Economics.
- WARREN P. TUFTS, Ph.D., Professor of Pomology, Davis.
- FRANK J. VEIHMAYER, Ph.D., Professor of Irrigation, Davis.
- EDWIN C. VOORHIES, B.S., Professor of Agricultural Economics.
- 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.
- 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., 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.
- ✶ HOWARD S. FAWCETT, Ph.D., Professor of Plant Pathology, Emeritus, Riverside.
- JOHN W. GREGG, B.S., Professor of Landscape Design, Emeritus.
- ✶ WILLIAM B. HERMS, Sc.D., Professor of Parasitology, 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.
- CARL B. BARNES, Major, Infantry, Associate Professor of Military Science and Tactics, 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.
- 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.

<sup>2</sup> In residence spring semester only, 1948-1949.



- † KATHERINE ESAU, Ph.D., Associate Professor of Botany, Davis.  
 JULIUS H. FREITAG, Ph.D., Associate Professor of Entomology.  
 CHARLES M. GILBERT, Ph.D., Associate Professor of Geology, 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.  
 ✖ HARRY E. JACOB, M.S., Associate Professor of Viticulture, Davis.  
 CLARENCE N. JOHNSTON, M.E., Associate Professor of Irrigation, Davis.  
 MAYNARD A. JOSLYN, Ph.D., Associate Professor of Food Technology.  
 GEORGE M. KUZNETS, Ph.D., Associate Professor of Agricultural Economics.  
<sup>a</sup> I. MICHAEL LERNER, Ph.D., Associate Professor of Poultry Husbandry.  
 ‡ ROBERT M. LOVE, Ph.D., Associate Professor of Agronomy, Davis.  
 JOHN H. MACGILLIVRAY, Ph.D., Associate Professor of Truck Crops, Davis.  
 GORDON MACKINNEY, Ph.D., Associate Professor of Food Technology.  
<sup>a</sup> BEN D. MOSES, B.S., Associate Professor of Agricultural Engineering, Davis.  
<sup>a</sup> IVER N. NELSON, Ph.D., Associate Professor of Spanish, Davis.  
 HAROLD P. OLMO, Ph.D., Associate Professor of Viticulture, Davis.  
 ROY OVERTREET, Ph.D., Associate Professor of Soil Chemistry.  
 EDGAR P. PAINTER, Ph.D., Associate Professor of Chemistry, Davis.  
 HAROLD G. REIBER, Ph.D., Associate Professor of Chemistry, Davis.  
 ✖ GEORGE A. RICHARDSON, Ph.D., Associate Professor of Dairy Industry, Davis.  
 EDWARD B. ROESSLER, Ph.D., Associate Professor of Mathematics, Davis.  
 LAUREN E. ROSENBERG, Ph.D., Associate Professor of Zoölogy, Davis.  
 CHESTER W. RUBEL, B.S.A., Associate Professor of Agricultural Extension.  
 FRANCIS L. SMITH, Ph.D., Associate Professor of Agronomy, Davis.  
 LESLIE M. SMITH, Ph.D., Associate Professor of Entomology, Davis.  
 WILLIAM C. SNYDER, Ph.D., Associate Professor of Plant Pathology.  
 ✖ PERRY R. STOUT, Ph.D., Associate Professor of Plant Nutrition.  
 H. LELAND VAUGHAN, B.S., Associate Professor of Landscape Design (Chair-  
 man of the Division).  
 REESE H. VAUGHN, Ph.D., Associate Professor of Food Technology.  
 THOMAS E. WEIER, Ph.D., Associate Professor of Botany, Davis.  
 CECIL E. YARWOOD, Ph.D., Associate Professor of Plant Pathology.  
 FREDERICK P. ZSCHEILE, JR., Ph.D., Associate Professor of Agronomy, 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.  
 GEORGE A. BAKER, 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.

† Sabbatical leave in residence, 1948-1949.

<sup>a</sup> In residence spring semester only, 1948-1949.

‡ Sabbatical leave of absence, 1948-1949.

Harry E. Jacob, died 3/2/49.

George A. Richardson, resigned 7/1/48.

Edward A. Steinhaus, Ph.D., Associate Professor of Insect Pathology.

Walter L. Dunkley, Assistant Professor of Dairy Industry,  
Davis (from Dec. 1, 1948.)

Ivan M. Lee, Ph.D., Assistant Professor of Agricultural Economics

- 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.  
 WILLIAM H. ENGLISH, Ph.D., Assistant Professor of Plant Pathology, Davis.  
 WALTER D. FISHER, Ph.D., Assistant Professor of Agricultural Economics.  
<sup>2</sup> SOLOMON FISHMAN, Ph.D., Assistant Professor of English, Davis.  
 DEANE P. FURMAN, Ph.D., Assistant Professor of Parasitology.  
 MILTON E. GARDNER, Ph.D., Assistant Professor of Physics, Davis.  
 CHARLES R. GRAU, Ph.D., Assistant Professor of Poultry Husbandry.  
 WILLIAM H. GRIGGS, Ph.D., Assistant Professor of Pomology, Davis.  
 JAMES F. GUYMON, Ph.D., Assistant Professor of Viticulture, Davis.  
 CARL J. HANSEN, Ph.D., Assistant Professor of Pomology, Davis.  
 JAMES F. HARRINGTON, Ph.D., Assistant Professor of Truck Crops, Davis.  
 HUDSON T. HARTMAN, 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.  
 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.  
 JAMES A. JENKINS, Ph.D., Assistant Professor of Genetics.  
 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.  
 F. HOWARD KRATZER, Ph.D., Assistant Professor of Poultry Husbandry,  
 Davis.  
 HARRY H. LAIDLAW, JR., Ph.D., Assistant Professor of Entomology, Davis.  
 HORTON M. LAUDE, Ph.D., Assistant Professor of Agronomy, Davis.  
 E. GORTON LINSLEY, Ph.D., Assistant Professor of Entomology.  
 FREDERICK W. LORENZ, Ph.D., Assistant Professor of Poultry Husbandry,  
 Davis.  
 LOUIS K. MANN, Ph.D., Assistant Professor of Truck Crops, Davis.  
 GEORGE L. MARSH, M.S., Assistant Professor of Food Technology.  
 GEORGE L. MEHREN, Ph.D., Assistant Professor of Agricultural Economics.  
 ABE E. MICHELbacher, Ph.D., Assistant Professor of Entomology.  
 WOODROW W. MIDDLEKAUFF, Ph.D., Assistant Professor of Entomology.

<sup>2</sup> In residence spring semester only, 1948-1949.

- MILTON A. MILLER, Ph.D., Assistant Professor of Zoölogy, Davis.  
 LEONARD L. MORRIS, Ph.D., Assistant Professor of Truck Crops, Davis.  
 GWENDOLYN B. NEEDHAM, Ph.D., Assistant Professor of English, Davis.  
 LOREN W. NEUBAUER, Ph.D., Assistant Professor of Agricultural Engineering, Davis.  
 JOHN W. OSWALD, Ph.D., Assistant Professor of Plant Pathology, Davis.  
 CHARLES G. PATTEN, Ph.D., Assistant Professor of Physics, 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.  
 CHARLES M. RICK, JR., Ph.D., Assistant Professor of Truck Crops, 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.  
~~EDWARD A. STEINHAUS, Ph.D., Assistant Professor of Insect Pathology.~~  
 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.  
 NIKITA P. TARASSUK, Ph.D., Assistant Professor of Dairy Industry, Davis.  
 ROBERT L. USINGER, Ph.D., Assistant Professor of Entomology.  
 LINDA VAN NORDEN, Ph.D., Assistant Professor of English, Davis.  
 DAVID H. VOLMAN, Ph.D., Assistant Professor of Chemistry, Davis.  
<sup>2</sup>JEAN WARREN, Ph.D., Assistant Professor of Home Economics, Davis.  
 WILBOR O. WILSON, Ph.D., Assistant Professor of Poultry Husbandry, Davis.  
 NORMAN B. AKESSON, M.S., Instructor in Agricultural Engineering, Davis.  
 HENRY L. ALDER, Ph.D., Instructor in Mathematics, Davis.  
<sup>1</sup>ROBERT J. BOUTHILLET, Ph.D., Instructor in Poultry Husbandry.  
 ROBERT K. BRINTON, Ph.D., Instructor in Chemistry, Davis.  
 ARTHUR L. BROWN, Ph.D., Instructor in Soils, Davis.  
 CURTIS M. FULTON, Ph.D., Instructor in Mathematics, Davis.  
 RAYMOND G. GROGAN, Ph.D., Instructor in Plant Pathology, Davis.  
 BYRON C. GUYER, JR., Ph.D., Instructor in English, Davis.  
 ROBERT M. HAGAN, Ph.D., Instructor in Irrigation, Davis.  
 ELIZABETH R. HOMANN, Ph.D., Instructor in English, Davis.

† Sabbatical leave of absence, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

A. Dinsmoor Webb, Assistant Professor of Entology, Davis.

Hubert A. Arnold, Instructor in Mathematics, Davis.  
Oscar G. Bacon, Ph. D., Instructor in Entomology.

Glen P. Lofgreen, , Instructor in Animal Husbandry, Davis.  
George Nyland, , Instructor in Plant Pathology, Davis.  
Dewey J. Raski, Ph.D., Instructor in Entomology and Parasitology.

Robert B. Casady, , Lecturer in Zoölogy, Davis.

Ernest M. Gifford, Jr., , Associate in Botany, Davis.

Silas M. Henderson, , Lecturer in Agricultural Engineering, Davis.

Milton Hildebrand, , Lecturer in Zoölogy, Davis.

Harold B. James, , Associate in Animal Husbandry, Davis.

Elizabeth Ann Jasper, , Associate in English for the spring  
semester, Davis.

Robert A. Kepner, , Lecturer in Agricultural Engineering, Davis.

R. Burton Litton, B.S., M.L.A., Lecturer in Landscape Design.

- WALTER E. HOWARD, Ph.D., Instructor in Zoölogy, Davis.  
 EVERETT W. JAMESON, Jr., M.A., Instructor in Zoölogy, Davis.  
 KARL R. JOHANSSON, Ph.D., Instructor in Dairy Industry, Davis.  
~~IVAN M. LEE, Ph.D., Instructor in Agricultural Economics.~~ U. Asst. Prof.  
 LAWRENCE E. MCADELL, A.B., Instructor in Music, Davis.  
 CARL B. O'BRIEN, Ph.D., Instructor in History, Davis.  
 DONALD M. REYNOLDS, Ph.D., Instructor in Bacteriology, Davis.  
 VERNE H. SCOTT, M.S., Instructor in Irrigation, Davis.  
 EDWARD S. SYLVESTER, Ph.D., Instructor in Entomology.  
 WILLIAM N. TAKAHASHI, Ph.D., Instructor in Plant Pathology.  
 STEPHAN WILHELM, Ph.D., Instructor in Plant Pathology.
- 
- EVERETT D. HOWE, M.S., Professor of Mechanical Engineering.  
 PAUL S. TAYLOR, Ph.D., Professor of Economics.  
 FRED H. ABBOTT, B.S., Associate in Dairy Industry, 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.  
 ARNOLD BREKKE, B.S., Lecturer in Agricultural Economics, Davis.  
 NICHOLAS CIRINO, Lecturer in Landscape Design.  
 R. LORENE DRYDEN, B.S., Associate in Home Economics, Davis.  
 JAMES P. FAIRBANK, B.S. Lecturer in Agricultural Engineering, Davis.  
 THEODORE W. FORBES, A.B., Junior Supervisor of Physical Education, Davis.  
 NORMAN W. FRAZIER, Ph.D., Lecturer in Entomology.  
 VARDEN FULLER, Ph.D., Lecturer in Agricultural Economics.  
 CLINTON C. GORHAM, B.S., Associate in Dairy Industry, Davis.  
 WARREN J. GROSS, A.B., Associate in Zoölogy, Davis.  
 GORDIE C. HANNA, B.S., Lecturer in Truck Crops, Davis.  
 WILLIAM A. HARVEY, M.S., Associate in Botany, Davis.  
 DORIS F. HEINEMAN, B.A.E., Lecturer in Home Economics, Davis.  
 VERNARD B. HICKEY, A.B., Associate Supervisor of Physical Education, Davis.  
 CARROLL E. HOWELL, M.S., Associate in Animal Husbandry, Davis.  
 MILDRED S. JENTSCH, M.S., Associate in Home Economics, Davis.  
 ELWOOD M. JUEGENSON, B.S., Lecturer in Education, Davis.  
 LOGAN M. JULIAN, D.V.M., Associate in Veterinary Anatomy, Davis.  
 WILLIAM H. LANGE, Jr., Ph.D., Lecturer in Entomolgy, Davis.  
 HAROLD D. LEWIS, B.S., Associate in Agricultural Engineering, Davis.  
 COBY LORENZEN, JR., M.S., ~~Associate~~ <sup>Lecturer</sup> in Agricultural Engineering, Davis.  
 WILLIAM C. MAILLARD, A.B., Associate in Mathematics and Physics, Davis.  
 HARRIET D. MANDA, M.S., Associate in Zoölogy, Davis.  
 JAMES C. MARR, A.E., Lecturer in Irrigation, Davis.  
 WILBUR W. MAYHEW, A.B., Associate in Zoölogy, Davis.  
 RICHARD J. MORRISEY, M.A., Lecturer in History, Davis.  
 CLEMENT A. PHILLIPS, M.S., Associate in Dairy Industry, Davis.



- KATHRYN B. ROLFE, M.S., Associate in Mathematics, 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.  
 LESTER L. SKOLL, M.A., Associate in Physics, Davis.  
 JOHN L. STAHL, A.B., Associate in Landscape Gardening, Davis.  
 GEORGE P. STECK, M.S., Associate in Mathematics, Davis.  
 LEONORA HOHL STROHMAIER, Ph.D., Lecturer in Food Technology.  
 ALFRED M. THYM, M.S., Associate in Agricultural Engineering, Davis.  
 IRVING F. TOOMEY, B.S., Supervisor of Physical Education, Davis.  
 MARYA WELCH, M.A., Junior Supervisor of Physical Education, 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, 113; Entomology 1, 106, 112, 127, 129; Forestry 1, 103, 125; all undergraduate courses in genetics except 104; Home Economics 1A–1B, 7, 10, 14, 101A–101B, 102A–102B, 103, 106, 120A–120B, 132, 134, 142, 160, and 190; Plant Pathology 121; Soil Science 110, 111, 112, 113, 114, 115. For regulations governing this list, see page 83.

*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 156 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.

† See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

Raymond E. Storie, B.S., Lecturer in Soil Technology.

George A. Stromgren, A.B., Assistant Supervisor of Physical Education, Davis.

James R. Tavernetti, M.S., Lecturer in Agricultural Engineering, Davis.

John M. Tucker, A.B., Associate in Botany, Davis.

William A. Williams, , lecturer in Viticulture, Davis.

101A. Not open to students who have completed Business Administration 123.

104. Given II by Mr. Fuller.

107. Not given.

## 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 <sup>and II</sup> Mr. ERDMAN  
 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.
- 101B. Coöperation in Agriculture. (3) I. Mr. ERDMAN  
 Prerequisite: Agricultural Economics 101A or Business Administration 123.  
 Farmers' coöperative organizations.
102. Land Economics. (3) II. 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 <sup>and II</sup> Mr. HOOS, ←  
 Prerequisite: Economics 1A-1B.  
 The application of economic principles to the problems of agriculture.
105. Agricultural Economics Measurements. (3) I. Mr. LEE  
 Lectures and laboratory.  
 Prerequisite: Economics 40, Mathematics 11A-11B.  
 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.
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.

- 112A-112B. Rural Sociology. (2-2) Yr. Mr. TAYLOR  
 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.
- \*113. Population Problems. (3) I. \_\_\_\_\_  
 Prerequisite: Economics 40.  
 Urban, rural, and regional variation in population phenomena; differential fertility and mortality; selective migration.
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) II. 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) II. Mr. TINLEY  
 Prerequisite: Agricultural Economics 101A-101B and Business Administration 6A.  
 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.  
 I: Bressler; II: Kuznets. Mr. BRESSLER, Mr. KUZNETS  
 Evaluation and treatment of economic data in agriculture, with emphasis on methods of analyzing relations between two or more variables.

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\* Not to be given, 1948-1949.

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.
- 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~~  
~~Mr. F. L. Smith~~  
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, Mr. MADSON

## 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 U. S.; the origin, characteristics, and adaptations of the more important breeds and the influence of environment upon their development.

## 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) I.

Mr. CRAIG

Lectures and laboratory.

Prerequisite: Entomology 1.

## 110. Insect Physiology. (3) II.

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. Weekly field trips on Saturday mornings.

Prerequisite: Entomology 1.

The classification of insects; taxonomic categories and procedure; bibliographical 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, prophylaxis, 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 nematode infections in cultivated crops. Techniques employed in the manipulation and examination of soil and infected plants.

\* Not to be given, 1948-1949.

127.

, Mr. Linsley



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 of plant virus diseases. 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  
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 the biological relationships between all types of microorganisms and insects. Detailed study of bacterial, fungous, virus, and protozoan diseases of insects; non-infectious diseases of insects; histopathology.
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, New World and Old World entomology alternating. Students may register for both presentations without duplication of credit.
- \*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.

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\* Not to be given, 1948-1949.

135. Insects in Relation to Flowering and Other Ornamental Plants. (3) I.  
Lectures and laboratory. 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 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

## FOOD TECHNOLOGY

- 112A-112B. Food Technology. (3-3) Yr.  
Mr. CRUICK, Mrs. STROHMAIER, Mr. MRAK, Mr. PHAFF  
Prerequisite: Chemistry 1A-1B and Bacteriology 1 or 2. Course 112A is  
not prerequisite to 112B.  
Physical, chemical, bacteriological, and economic principles and tech-  
nological processes, involved in the preparation, preservation, and examina-  
tion of fruit and vegetable products, including canned, dried, and fermented  
products.
- 115A-115B. Food Technology. (4-4) Yr.  
Lectures and laboratory. Mr. JOSLYN, Mr. MACKINNEY, Mr. MARSH  
Prerequisite: Chemistry 1A-1B, 5, and 8; Bacteriology 1 and 4.  
Application of quantitative, physical, chemical, and bacteriological  
methods of analysis to fruit and vegetable products; interpretation of  
results in relation to manufacturing methods and commercial standards;  
experimental study of industrial fermentations and food processing.
116. Biology of Yeast. (4) II. Mr. MRAK, Mrs. STROHMAIER, Mr. PHAFF  
Lectures and laboratory.  
Prerequisite: Chemistry 1A-1B, 5, and 8; Botany 1 or 12; Bacteri-  
ology 1.  
Morphology, development, and classification of yeasts; relation to other  
fungi; growth requirements; metabolic and other activities of yeast includ-  
ing their zymological and industrial aspects.

117. The Microbiology of Foods. (4) I. Mr. VAUGHAN  
 Prerequisite: Chemistry 1, 5, 8, 9; Bacteriology 1, 2; Food Technology 115A. Recommended but not required: Bacteriology 105, Food Technology 116, and Public Health 113.  
 Characteristics, activity, and control of beneficial and spoilage organisms in the canning, preserving, pickling, dehydration, freezing, wine, and other food industries.
120. Plant Pigments. (3) II. Mr. MACKINNEY  
 Lectures and laboratory.  
 Prerequisite: Biochemistry 103 or equivalent, one year of college physics. Enrollment limited to ten students.  
 Chemistry of the coloring matters of fruits and vegetables with reference to changes they undergo during storage and processing, with particular emphasis on techniques of their spectrophotometry and chromatography.
- 127A-127B. Proseminar in Food Technology. (1-1) Yr.  
The STAFF (Mr. BRAK in charge)  
 Assigned topics, reports, and discussions.

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. CRUESS in charge)  
 Particularly the opportunity for the study of yeasts and bacteria, plant pigments, oxidation reduction, and plant enzymes. Also offered are 3 to 4 units in zymology (the science of fermentation) and 2 to 4 units in plant pigments, for properly qualified students.

## GRADUATE COURSE

- 237A-237B. Research in Food Technology. (1-6; 1-6) Yr.  
The STAFF (Mr. CRUESS in charge)

## FORESTRY

(For courses in Forestry, see page 316)

## GENETICS

100. Principles of Genetics. (4) I. Mr. DEMPSTER  
 Lectures and laboratory.  
 Prerequisite: general botany (Botany 1, 12, or equivalent) and 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. G. L. 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 its 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. LEENER, Mr. DEMPSTER  
Prerequisite: Genetics 100 and elementary statistics. 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.  
Mr. CLAUSEN, Mr. ASMUNDSON, Mr. BRIGGS, Mr. S. W. BROWN, Mr. DEMPSTER, Mr. GREGORY, Mr. JENKINS, Mr. RICK, Mr. STEBBINS
- 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.  
Closed seminar devoted to intensive study of special topics in genetics, under supervision of members of the staff.

## HOME ECONOMICS

(For courses in Home Economics, see page 344)

## HORTICULTURE

- \*2. Fruit Growing. (3) I. Mr. R. M. BROOKS  
Prerequisite: Botany 1 or 12.  
Fruit growing practices; propagation, planting, and culture of orchard trees, and small fruits.

## LANDSCAPE DESIGN

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.

\* Not to be given, 1948-1949.

- 1A-1B. Elementary Design and Theory. (3-3) Yr.  
Lectures and laboratory. Mr. ROYSTON, Mr. VAUGHAN  
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.
- 101A-101B. Intermediate Design and Theory. (3-3) Yr.  
Lecture and laboratory. Mr. VAUGHAN, Mr. ROYSTON  
Prerequisite: Landscape Design 1A-1B.  
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 drain-  
age systems; reports and estimates.
- 112A-112B. Plant Materials and Planting Design. (3-3) Yr.  
Lecture, laboratory, and field trips. Mr. SHEPHERD, ———  
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.  
Lecture, laboratory, and field trips. Mr. SHEPHERD, ———  
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. (3) 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 COURSES

- 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 lower division courses in Plant Nutrition, see Soil Science)

- 201A-201B. Research. (1-9; 1-9) Yr.  
Mr. ARNON, Mr. BARKER, Mr. BENNETT, Mr. DORE, Mr. HASSID,  
Mr. HOAGLAND, Mr. STOUT, Mr. STUMPF  
Open to 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. DORE, 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  
Open to properly 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)  
Staff seminar, offered without credit for staff and graduate students.

## 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. Mr. RAWLINS, Mr. ARK  
Laboratory.  
Prerequisite: Plant Pathology 120.  
(A) Histology and phytopathological technique. (B) Application of  
histochemical methods to the study of diseased plant tissues.  
NOTE.—May be repeated once without duplication of credit (maximum,  
4 units). Part (B) to be given in 1948-1949.
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  
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 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 in the Animal Science Curriculum on the Berkeley campus to meet biochemistry requirements.

Poultry Hygiene. (See Veterinary Science 101.)

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 I, courses basic to the problems elected, and consent of the instructor.

Problems relating to the nutrition, breeding, incubation, physiology, or egg quality of chickens may be elected.

#### GRADUATE COURSE

200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.

Mr. L. W. TAYLOR, 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: Geology 1A, Chemistry 1A-1B, Physics 2A-2B.  
An introduction to the physical and chemical properties of the soil.
101. Development and Morphology of Soils. (3) II. Mr. JENNY  
Prerequisite: Geology 1A, Chemistry 1A-1B. Soil Science 100 is 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  
Prerequisite: Soil Science 100, including laboratory; calculus (Mathematics 3A-3B or 11A-11B).  
Recommended: physical chemistry. If possible, 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 1A, 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  
 Lectures and one other hour to be arranged.  
 Prerequisite: Chemistry 1A-1B, 8, Geology 1A.  
 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. Mr. OVERSTREET, Mr. STOUT  
 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. HOAGLAND, Mr. ARNON  
 Prerequisite: Botany 120A-120B or 111. (120B or 111 may be taken concurrently).  
 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. JENNY 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.

#### 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. HOAGLAND, Mr. JENNY, Mr. OVERSTREET, Mr. STORIE,  
 Mr. STOUT  
 Open only to students with an average grade of at least B, who have also the approval of the undergraduate adviser in soil science.

#### GRADUATE COURSES

- 201A-201B. Research in Soil Science. (1-6; 1-6) Yr.  
 Mr. ARNON, Mr. BARKER, Mr. BODMAN, Mr. L. E. DAVIS, Mr. HOAGLAND,  
 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 487)

(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)

\* Not to be given, 1948-1949.

Underline Courses for fall 4849 Re  
✓ instructor

Underline Courses for Spring 49-50  
✓ instructor

Checked with Course Reports  
Checked with Course Reports

119. Farm Management. (3) II.

106. Heat Transfer in Agricultural Environment. (2) Mr. Brooks

115. ... Plants and Management.

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115

Madison

## AGRICULTURAL ECONOMICS

- 101A. Principles of Marketing Agricultural Products. (3) II. Mr. MEHREN  
 103. Agriculture in the American Economy. (3) II. \_\_\_\_\_  
 118. Farm Organization. (3) I. Mr. HEDGES  
 199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 The STAFF (Mr. MEHREN in charge)

## AGRICULTURAL ENGINEERING

6. Introduction to Surface Climatology. (2) II. Mr. F. A. BROOKS  
 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  
 103. Agricultural Power. (3) II. Mr. MOSES, Mr. LORENZEN  
 104. Agricultural Machinery. (3) I. Mr. BAINER  
 105. Farm Structures. (3) I. Mr. NEUBAUER  
 †113. Agricultural Power. (4) II. Mr. MOSES, Mr. LORENZEN  
 †114. Agricultural Machinery. (3) I. Mr. BAINER  
 †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. F. A. BROOKS in charge)

## GRADUATE COURSE

- 200A-200B. Research in Agricultural Engineering. (1-6; 1-6) Yr.  
 Mr. BAINER, Mr. BOELTER, Mr. F. A. BROOKS, Mr. MOSES,  
 Mr. NEUBAUER, Mr. PERRY, Mr. HOWE, Mr. WALKER

## 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. Field Crop Technology. (3) II. \_\_\_\_\_  
 114. Plant Breeding. (3) II. Mr. BRIGGS  
 \* 115. Range and Forage Crops. (3) II. Mr. LOVE  
 199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 The STAFF (Mr. BRIGGS in charge)

† Designed for students in the College of Engineering who are majoring in agricultural engineering; not open to College of Agriculture students.

## GRADUATE COURSE

200A-200B. Research in Agronomy. (1-6; 1-6) Yr.

Mr. BRIGGS, Mr. MADSON, Mr. CONRAD, Mr. LOVE, Mr. F. L. SMITH,  
Mr. STANFORD, Mr. ALLARD, Mr. LAUDE, Mr. KNOWLES, Mr. SCHALLER

## ANIMAL HUSBANDRY

- ♣ 7. Introduction to Animal Husbandry. (3) I. Mr. HUGHES
8. Livestock Judging and Selection. (2) I. Mr. HEITMAN
101. Animal Biochemistry. (3) II. Mr. GOSS
102. Animal Biochemistry Laboratory. (2) II. Mr. GOSS
103. Livestock Feeds and Feeding. (3) I. Mr. MILLER
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
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
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. YOUNG, Mr. H. H. COLE, Mr. GREGORY, Mr. HOWELL,  
Mr. KLEIBER, Mr. R. F. MILLER, Mr. REGAN, Mr. STORER, Mr. J. F.  
WILSON, Mr. GOSS, Mr. GUILBERT, Mr. MEAD, Mr. CUPPS, Mr.  
HEITMAN, Mr. RALSTON

201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr.  
The STAFF (Mr. HUGHES in charge)

## BACTERIOLOGY

1. General Bacteriology. (4) I and II. Mr. MUDGE, Mr. STARR
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. MUDGE in charge)

## GRADUATE COURSE

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)

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203. Seminar in Plant Physiology. (I) I and II Mr. Stocking, Mr. Crafts  
Mr. Carrier, ~~Mr. Goss~~

III.

Mr. Young

Botany 5  

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1206 Griffard  
Currier  

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2036 Crafts  

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Chem 1a Ric Brinton  

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## BOTANY

1. General Botany. (5) I and II.  
Mr. ROBBINS, Mr. WEIER, Mr. CURRIER, Mr. STOCKING, Mr. TUCKER
5. General Morphology. (4) II. \_\_\_\_\_
7. Plant Physiology. (4) I. Mr. STOCKING
- 100D. Microscopic Technique. (2) I. Miss ESAU
105. Plant Anatomy. (4) I. Miss ESAU
- \*106. Morphology of Flowering Plants. (3) II. Miss ESAU
107. Weed Control. (4) II. Mr. ROBBINS, Mr. CRAFTS, Mr. HARVEY
108. Systematic Botany of Seed Plants. (3) II. Mr. TUCKER
- 120A-120B. Plant Physiology. (2-2) Yr. Mr. CRAFTS
- 121A-121B. Plant Physiology Laboratory (2-2) Yr.  
Mr. CRAFTS, Mr. CURRIER
130. Plant Cytology. (4) I. Mr. WEIER
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. ROBBINS in charge)

## GRADUATE COURSE

- 200A-200B. Research in Botany. (1-6; 1-6) Yr.  
The STAFF (Mr. ROBBINS in charge)

## CHEMISTRY

- 1A-1B. General Chemistry. (5-5) Yr. Beginning either semester.  
Mr. YOUNG, Mr. ANDREWS, Mr. KEEFER, Mr. R. E. KEPNER,  
Mr. PAINTER, Mr. REIBER, Mr. VOLMAN, \_\_\_\_\_
5. Quantitative Analysis. (3) II. Mr. KEEFER
8. Organic Chemistry. (3) I. Mr. REIBER
9. Organic Chemistry. (3) I. Mr. ANDREWS, Mr. R. E. KEPNER
- 12A-12B. 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 Laboratory. (3) I. ~~Mr. KEEFER~~
113. Chemistry of Colloids. (3) I. Mr. VOLMAN

\* Not to be given, 1948-1949.

114. Physical Chemistry, Thermodynamics. (3) I. Mr. YOUNG

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

4. Dairy Products Judging. (1) I. Mr. PHILLIPS

49. Summer Practice and Observation Course. (6)  
The STAFF (Mr. GORHAM in charge)

101A-101B. Dairy Products. (5-5) Yr.  
Mr. ROADHOUSE, Mr. JACK, Mr. PHILLIPS, ———  
I: Mr. Roadhouse, ———; II: Mr. Jack, Mr. Phillips.

106. Chemistry of Milk and Dairy Products. (4) II.  
Mr. RICHARDSON, Mr. TARASSUK

107. Laboratory Control in Dairy Technology. (3) I. Mr. TARASSUK

142. Dairy Bacteriology. (3) I. ———

160. Proseminar. (1) II. The STAFF (Mr. JACK in charge)

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)

## DECORATIVE ART

(For courses in Decorative Art, see Home Economics, page 344)

## ECONOMICS

1A. Principles of Economics. (3) I and II. Mr. HEDGES, Mr. MEHREN  
I: Mr. Hedges; II: Mr. Mehren.

1B. Principles of Economics. (3) II. ———

199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Mr. MEHREN

## EDUCATION

110. Introduction to Educational Psychology. (3) II. ———

†160. Vocational Education. (2) I and II. Mr. SUTHERLAND

† Open only to apprentice teachers and graduate students.

DI 101b

Dunkley-Phillips

Econ 1A  
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Black  
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142.

Mr. Johanson

+ 320 A.

Mr. Juergenson

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Mr. Marr, Mr. Scott →

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320a EM Juergenson  
" B " "

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Engel 1B Van Norden  
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- †161. Problems in Vocational Education. (2) I and II. Mr. SUTHERLAND
170. Secondary Education. (2) II.
198. Directed Group Study of Agricultural Education. (2) II.  
The STAFF (Mr. SUTHERLAND in charge)
199. Special Study for Advanced Undergraduates in Agricultural Education.  
(1-3) 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. SUTHERLAND
- †320B. Audio-Visual, Radio, and other Instructional Resources. (2) I and II.  
Mr. SUTHERLAND
- †320C. Supervised Teaching. (3) I and II. Mr. SUTHERLAND
- †320E. Methods of Teaching. (2) I and II. Mr. SUTHERLAND
- †323. Practicum in Supervised Teaching. (2) I and II. Mr. SUTHERLAND

## ENGINEERING

- + 1A. Plane Surveying. (3) I.

## ENGLISH

- 1A. Composition. (3) I and II.  
Mr. FISHMAN, Miss VAN NORDEN, Mrs. WRIGHT,  
Mr. GUYER, Mrs. HOMANN, Mrs. NEEDHAM
- 1B. Introduction to Literature. (3) I and II. Mr. GUYER, Mrs. WRIGHT
9. Directed Reading. (1-2; 1-2) I and II. Miss VAN NORDEN, Mrs. WRIGHT
- 44A-44B. Masterpieces of Literature. (3-3) Yr.  
Mr. GUYER, Miss VAN NORDEN
- 46A-46B. Survey of English Literature. (3-3) Yr.  
Mr. FISHMAN, Mrs. HOMANN
- 125C-125D. The Novel. (3-3) Yr. Mrs. NEEDHAM

## ENTOMOLOGY AND PARASITOLOGY

1. General Entomology. (4) II. Mr. BOHART
105. Apiculture. (4) II. Mr. ECKERT
107. Queen Bee Rearing. (4) II. Mr. LADLAW, JR.
116. Veterinary Parasitology. (3) I. Mr. DOUGLAS
124. Economic Entomology. (4) I. Mr. BAILEY, Mr. L. M. SMITH

† Open only to apprentice teachers and graduate students.

## Agriculture

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. BAILEY, Mr. BOHART, Mr. DOUGLAS, Mr. ECKERT,  
Mr. LANGE, Mr. L. M. SMITH, Mr. LAIDLAW, JR.

## GRADUATE COURSE

- 201A-201B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.  
 THE STAFF (Mr. BAILEY in charge)

## FRENCH

1. Elementary French. (4) I and II. Mr. NELSON, —  
 2. Elementary French. (4) II. Mr. NELSON, —

## GENETICS

100. Principles of Genetics. (4) I. Mr. GREGORY

## GRADUATE COURSE

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr.  
Mr. CLAUSEN, Mr. GREGORY, Mr. BRIGGS, Mr. OLMO,  
Mr. ASMUNDSON, Mr. LOVE, Mr. RICK

- 201A-201B. Staff Seminar in Genetics. (No credit) Yr.  
 The STAFF (Mr. BRIGGS in charge)

## GEOLOGY

- 1A. General Geology. (3) II. Mr. GILBERT

## GERMAN

1. Elementary German. (4) I. —  
 2. Elementary German. (4) II. —

## HISTORY

- 4A-4B. History of Western Europe. (3-3) Yr. Mr. O'BRIEN

- 8A-8B. History of the Americas. (3-3) Yr. Mr. SHIDELER, Mr. MORRISEY

- 17A-17B. History and Institutions of the United States. (3-3) Yr.  
 Mr. PURYEAR

148. Recent World History. (3) II. Mr. PURYEAR

- 171A-171B. History and Institutions 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 the Southwest and the Pacific Coast. (2-2) Yr. —

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 Mr. PURYEAR, Mr. MORRISEY

## HOME ECONOMICS

(For courses offered at Davis, see under Home Economics, page 349)

French 2

Puknat

German 2

SA Puknat

1.

Mr. Pubnat

200A.

Mr. Smith, Mr. Brown

1.

Mr. Pubnat

189A.

Mr. Morrissey

## HORTICULTURE

2. Fruit Growing. (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
- 106A-106B. Fruit Plants. (2-2) Yr. Mr. CRANE

## Viticulture and Enology

- 105v. Viticulture: Fruit Handling and Varieties. (3) Summer Course (six weeks). Mr. WINKLER
116. General Viticulture. (4) II. Mr. WINKLER
- 120A-120B. Enology. (3-3) Yr. Mr. AMERINE
- 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

## General Horticulture

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
121. Advanced Horticulture. (3) I. Mr. PROEBSTING
199. Special Study for Advanced Undergraduates in Pomology. (1-5) I and II. The STAFF (Mr. TUFTS and 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. VEIHMAYER,
110. Development and Use of Farm Irrigation Water Supplies and Systems. (4) I. Mr. JOHNSTON

\* Not to be given, 1948-1949.

120. Irrigation Hydraulics. (3) I. Mr. JOHNSTON

130. Underground Water and Farm Irrigation Pumping Plants. (3) II.  
Mr. JOHNSTON

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)

## LANDSCAPE DESIGN

3. Planning the Home Grounds. (2) I and II. Mr. STAHL

## MATHEMATICS

C. Trigonometry. (3) I and II. The STAFF (Mr. ROESSLER in charge)

D. Intermediate Algebra. (3) I and II. The STAFF (Mr. ROESSLER in charge)

1. College Algebra. (3) I and II. Mrs. ROLFE, Mr. MAILLARD

\* A. Analytic Geometry and Calculus, First Course. (3) I and II.  
Mr. BURDETTE, —

3B. Analytic Geometry and Calculus, Second Course. (3) I and II.  
Mr. FULTON, —

4A. Analytic Geometry and Calculus, Third Course. (3) I and II.  
Mr. HAYES, Mr. FULTON

4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.  
Mr. BURDETTE, Mr. HAYES

8. Theory of Algebraic Equations. (3) II. Mr. BURDETTE

\* 10. Spherical Trigonometry and Applications. (2) I. —

11A-11B. Analytic Geometry and Calculus. (3-3) Yr. Mr. SUTHER

13. Elementary Statistics. (3) I and II.  
Mr. ROESSLER, Mr. HAYES, Mrs. ROLFE

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. BAKER

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. ROESSLER in charge)

\* Not to be given, 1948-1949.

Math 1

3a

3b

CM Fulton

CA Hayes

HL Alder

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W. J. ...

3A.

Mr. Alder

11A.6

Mr. Arnold

13.

Mr. Baker



28.

, Mr. Sholil

38.

, Mr. Sholil

Math Sci 115b Cole

" 106b "

Physics 2A & Kolch  
2A "

## GRADUATE COURSES

290. Seminar 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
- 152A. Industrial Mass Transfer. (3) II. Mr. PERRY

## MILITARY SCIENCE AND TACTICS

- 10A. Elementary (First Year) (2) I. The STAFF (Mr. BARNES in charge)
- 10B. Elementary (First Year). II. The STAFF (Mr. BARNES in charge)
- 11A. Elementary (Second Year). (2) I. The STAFF (Mr. BARNES in charge)
- 11B. Elementary (Second Year). (2) II. The STAFF (Mr. BARNES in charge)
- 106A-106B. Advanced Infantry (First Year). (3-3) Yr.  
The STAFF (Mr. BARNES in charge)
- 107A-107B. Advanced Infantry (Second Year). (3-3) Yr.  
The STAFF (Mr. BARNES in charge)

## PHYSICAL EDUCATION

1. Physical Education for Men. (½) I and II.  
Mr. TOOMEY, Mr. E. S. WILSON, Mr. SCHALL,  
Mr. HICKEY, Mr. STROMGREN
26. Physical Education for Women. (½) I and II. Miss WELCH

## PHYSICS

- \* 2A-2B. General Physics. Lectures. (3-3) Yr. Beginning either semester.  
Mr. GARDNER, Mr. PATTEN A
- \* 3A-3B. General Physics Laboratory. (1-1) Yr. Beginning either semester.  
Mr. GARDNER, Mr. PATTEN A
- 4A. General Physics. (4) II. Mr. PATTEN
- 4B. General Physics. (4) I. Mr. PATTEN
- 4C. General Physics. (4) II. Mr. GARDNER
- \*106. Atomic Structure and Structure of Matter. (3) II. Mr. GARDNER
116. Heat. (2) I. Mr. PATTEN
129. Introduction to Electronics. (3) II. Mr. GARDNER
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF

\* Not to be given, 1948-1949.

## PHYSIOLOGY

\*1A. Introductory Physiology. (3) I. —  
A\*1c. Introductory Physiology Laboratory. (2) I. —  
A

## PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science)

## PLANT PATHOLOGY

120. Plant Diseases. (4) II. Mr. LEACH, Mr. HOUSTON, Mr. ENGLISH125. Diseases of Truck and Field Crops. (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

## GRADUATE COURSE

230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr.Mr. KENDRICK, Mr. LEACH, Mr. E. E. WILSON, Mr. HEWITT,  
Mr. HOUSTON, Mr. OSWALD, Mr. ENGLISH, Mr. GROGAN

## POLITICAL SCIENCE

113. American Political Theory. (2) II.

Mr. SHIDELEER, ———

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. 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. —  
A

## PUBLIC HEALTH

\*5A. Elementary Public Health. (3) II. —————

\* Not to be given, 1948-1949.

1A.

1C.

Mr. Casady

Mr. Casady

1A.

Mr. Bursch, III

1.

Mr. Lubnat

Subject A.

Mr. Jasper, Mr. Gayer

105.

Mr. Smith

Speech 1b

Suby A

Needham

Wright  
JASP

TC # 2010 JRM

## 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. VEIHMAYER

## GRADUATE COURSE

- 200A-200B. Research in Soil Science. (1-6; 1-6) Yr.  
Mr. CONRAD, Mr. L. E. DAVIS, Mr. VEIHMAYER

## SPANISH

1. Elementary Spanish. (4) I and II. Mr. NELSON, —
2. Elementary Spanish. (4) II. Mr. NELSON, —

## SPEECH

- 1A. Elements of Public Speaking. (3) I and II.  
Mr. GUYER, Mrs. HOMANN, Mr. FISHMAN, Mrs. NEEDHAM,  
Miss VAN NORDEN, Mrs. WRIGHT
- 1B. Principles and Types of Speech. (3) II. Mr. FISHMAN

## SUBJECT A: ENGLISH COMPOSITION

- x Subject A. English Composition. (No credit) I and II. Mrs. SIKES A

## TRUCK CROPS

1. Vegetable Production. (3) I and II. Mr. MACGILLIVRAY, Mr. HANNA  
I: Mr. MacGillivray; II: Mr. Hanna.
- y 105. Systematic Olericulture. (3) I. Mr. RICK A
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.  
Mr. KNOTT, Mr. MACGILLIVRAY, Mr. G. N. DAVIS, Mr. DONEEN,  
Miss ESAU, Mr. HANNA, Mr. HARRINGTON, Mr. O. A. LORENZ,  
Mr. MANN, Mr. MORRIS, Mr. PRATT, Mr. RICK, Mr. P. G. SMITH

## GRADUATE COURSE

- 200A-200B. Research in Truck Crops. (1-6; 1-6) Yr.  
Mr. KNOTT, Mr. G. N. DAVIS, Mr. DONEEN, Miss ESAU, Mr. HARRINGTON,  
Mr. O. A. LORENZ, Mr. MACGILLIVRAY, Mr. MANN,  
Mr. MORRIS, Mr. PRATT, Mr. RICK, Mr. P. G. SMITH.



## VETERINARY SCIENCE

111. Principles of Pathology and Control of Diseases of Domestic Animals.  
(3) II. Mr. JASPER

## GRADUATE COURSE

200A-200B. Research in Animal Pathology. (1-6; 1-6) Yr.  
Mr. H. S. CAMERON, Mr. HINSHAW, Mr. JASPER

## VITICULTURE

(For courses in Viticulture and Enology, see Horticulture)

## ZOOLOGY

1A. General Zoölogy. (5) I. Mr. STORER, Mr. MILLER, Mr. ROSENBERG

1B. Vertebrate Anatomy. (3) II. Mr. STORER, Mr. MILLER

1C. Vertebrate Embryology. (2) II. Mr. ROSENBERG

10. General Biology. (3) II. Mr. ROSENBERG

100D. Microscopic Technique. (2) II. Mr. ROSENBERG

\*116. Economic Vertebrate Zoölogy. (3) II. Mr. STORER

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. STORER, Mr. MILLER, Mr. ROSENBERG

## GRADUATE COURSE

200A-200B. Research in Zoölogy. (1-6; 1-6) Yr.  
Mr. STORER, Mr. MILLER, Mr. ROSENBERG

## (GIVEN AT RIVERSIDE)

## GRADUATE COURSES

## ENTOMOLOGY

200A-200B. Seminar in Entomology, including Biological Control. (1-1) Yr.  
The STAFF (Mr. BOYCE 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

\* Not to be given, 1948-1949.

120. Anatomy of Domestic Animals. (9) I.

(v. course approved  
Sept 3, 1948).

Mr. Hart, Mr. Schalm, Mr. De Orme  
Mr. Julian.

121. Microbiology. (10) II.

(v. course approved  
Sept. 3, 1948).

Mr. Beach, Mr. Hinshaw,  
Mr. McNeil.

199. Special Study for Advanced Undergraduates. (1-5) I  
and II.

(v. course approved  
Sept 3, 1948)

Mr. Cameron, Mr. Hart, Mr.  
Hinshaw, Mr. Jasper, Mr. Peoples.

**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.

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).

MIRIAM E. SIMPSON, Ph.D., M.D., Professor of Anatomy.

WILLIAM R. LYONS, Ph.D., Associate Professor of Anatomy.

WILLIAM O. REINHARDT, A.B., M.D., Associate Professor of Anatomy.

C. WILLET ASLING, Ph.D., M.D., Assistant Professor of Anatomy.

ALEXEI A. KONEFF, M.D., Assistant Professor of Anatomy and Lecturer in Histological Technique.

RICHARD G. HARDENBROOK, A.B., M.D., Instructor in Anatomy.

ROBERT M. JAMESON, M.D. (Toronto), D.T.M. (McGill), Instructor in Anatomy.

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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 83.

## 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, and 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 1A, 1c. 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. FEINSTEIN

Lectures and laboratory. Enrollment limited to twelve students.

105. Systematic Human Anatomy. (5) I.  
Mr. SAUNDERS (in charge), Mr. HARDENBROOK,  
Mr. JAMESON, Mr. REINHARDT  
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. SAUNDERS (in charge), Mr. HARDENBROOK,  
Mr. JAMESON, Mr. REINHARDT  
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 156.

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.  
Mr. SAUNDERS and the STAFF  
This course is offered in Berkeley and San Francisco.

## ANTHROPOLOGY

EDWARD W. GIFFORD, Professor of Anthropology and Director of the Anthropological Museum.

<sup>2</sup>ROBERT H. LOWIE, Ph.D., Sc.D., Professor of Anthropology (Chairman of the Department).

DAVID G. MANDELBAUM, Ph.D., Professor of Anthropology.

<sup>1</sup>RONALD L. OLSON, Ph.D., Professor of Anthropology.

A. L. KROEBER, Ph.D., Sc.D., Professor of Anthropology, Emeritus, and Director, Emeritus, of the Anthropological Museum.

THEODORE D. McCOWN, Ph.D., Associate Professor of Anthropology and Curator of the Anthropological Museum. (Acting Chairman of the Department, fall semester.)

ROBERT F. HEIZER, Ph.D., Assistant Professor of Anthropology and Assistant Curator of American Archaeology.

JOHN H. ROWE, Ph.D., Assistant Professor of Anthropology.

GEORGE A. PETTIT, Ph.D., Lecturer in Anthropology.

H. F. LUTZ, Ph.D., D.D., Associate Curator of Near Eastern Archaeology and Professor of Egyptology and Assyriology.

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 83.

*Departmental Major Adviser:* Mr. T. D. McCOWN.

*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; either 181-182 or 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 114; Philosophy 108, 147; Psychology 141, 145A-145B; Public Health 160A; Sociology 141, 165A-165B, 166A-166B; Zoölogy 114, 115.

Students who fail to maintain a satisfactory scholarship average may be dismissed from the major at any time.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

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.  
Mr. HEIZER, Mr. LOWIE, Mr. McCOWN, Mr. ROWE  
Lectures and one section meeting a week.
- 2A. Prehistory and cultural growth. Mr. McCOWN, Mr. ROWE  
2B. Cultural patterns and dynamics. Mr. LOWIE, Mr. HEIZER

UPPER DIVISION COURSES

General prerequisite: courses 1, 2A-2B, or junior standing.

- 101A-101B. Ethnography of the World. (3-3) Yr. Mr. GIFFORD, Mr. LOWIE  
A descriptive survey of representative primitive cultures, including  
backward peoples of civilized countries. Either half of the course may be  
taken independently.
- \*102. Chapters in Culture History. (3) II. Mr. LOWIE  
The topics considered will include economic life, primitive literature  
and language.
- 105A-105B. The American Indians. (3-3) Yr. Mr. HEIZER, Mr. ROWE  
Development, spread, and attainments of culture; native races and lan-  
guages.
- 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; rela-  
tions with historic Indians.
- \*111. Prehistory. (3) II. Mr. McCOWN  
Prerequisite: course 2A.  
Origin, development, and distribution in space and time of the pre-  
historic cultures of the Old World.
- \*112. Protohistoric Ethnography of Europe. (3) I. Mr. McCOWN  
Manners and customs; social and economic organization; art and re-  
ligion 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 Philip-  
pines, 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.

\* Not to be given, 1948-1949.

120. Language and Culture. (3) I. Mr. ROWE  
Language and thought; classification of languages; linguistic aspects of culture; language, nation and state.
- \*123. Indians of the Southwest. (3) I. Mr. GIFFORD  
Prehistory: the ancient inhabitants, Basket Makers, Pueblos, and related peoples. Archaeological methods employed. The modern tribes and their relations to the early inhabitants. Connections of the Southwest with Mexico and other places.
- \*124. Primitive Religion. (3) II. Mr. MANDELBAUM  
Comparative survey of religion and magic.
- 125A-125B. Comparative Society. (3-3) Yr. Mr. OLSON, Mr. GIFFORD  
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) I. 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; industries; beliefs.
- \*139. Africa. (3) I. Mr. HEIZER  
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.
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) I. 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.

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\* Not to be given, 1948-1949.



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. PETTIT  
Methods and problems in the transmission of culture from generation to generation.
- \*181. Europe and the Caucasus. (3) I. Mr. LOWIE  
The simpler peoples and typical samples of higher cultures will be considered from an anthropological point of view.
- \*182. Asia. (3) II. Mr. LOWIE  
Emphasis will be placed upon the simpler cultures.
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 and II. Mr. ROWE, Mr. MANDELBAUM  
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 fall semester;  
Mr. MANDELBAUM in charge spring semester)

RELATED COURSES IN OTHER DEPARTMENTS

- General Human Anatomy (Anatomy 102).  
Evolution and Classification of Fossil Mammals (Paleontology 114).  
Biometry (Public Health 160A).  
Genetics (Zoölogy 114).  
Human Genetics (Zoölogy 115).  
India (Classics 197).  
Religion and Mythology of Egypt, Babylonia, and Assyria (Near Eastern Languages 102A-102B).

\* Not to be given, 1948-1949.

- Buddhism as a Cultural Factor in the Far East (Oriental Languages 172A-172B).
- Structure of Chinese Medieval Society (Sociology 165A-165B).
- Ethnic Compounds of Chinese Culture (Sociology 166A-166B).
- Social Philosophy (Philosophy 108).
- Theories of History (Philosophy 147).
- Personality in Society and Culture (Psychology 141).
- Social Psychology (Psychology 145A-145B).
- 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 113, 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 156.

206. Proseminar. (2) I and II. Mr. McCOWN, Mr. MANDELBAUM  
Introduction to research. For new graduate students in anthropology.
- 207A\*-207B. History and Theory of Anthropology. (2-2) Yr. Mr. LOWE  
Prerequisite: course 206.
- 209A-\*209B. Culture Problems of Eurasia and North America. (2-2) Yr. Mr. OLSON  
Prerequisite: course 206.
210. Cultural Relationships between North and South America. (2) II. Mr. HEIZER  
Prerequisite: course 206.

\* Not to be given, 1948-1949.

211. Problems in the Culture History of Europe and the Mediterranean. (2) II.  
Prerequisite: course 206. Mr. McCOWN
- 218H. Culture and Personality: the Psychological Approaches. (2) I.  
Mr. MANDELBAUM
237. Culture Problems of Western North America. (2) I. 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.
299. Directed Research. (2-6) I and II.  
The STAFF (Mr. McCOWN in charge fall semester;  
Mr. LOWIE in charge spring semester)

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, 35,000 from the Eastern Hemisphere, 7,000 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.

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 (Chairman of the Department).

WILLIAM C. HAYS, B.S., F.A.I.A., Professor of Architecture, Emeritus.

\* JACQUES SCHNIEB, M.A., Associate Professor of Sculptural Design.

GEORGE A. DOWNS, M.F.A., Associate Professor of Architecture.

HAROLD A. STUMP, A.B., Assistant Professor of Architecture.

THOMAS F. CHACE, B.S., Lecturer in Architecture.

JAMES GAYNER, Lecturer in Architecture.

HENRY J. LAGORIO, M.A., Instructor in Architecture.

RICHARD O'HANLON, Lecturer in Sculptural Design.

WILLIAM M. RICE, A.B., Lecturer in Water Color.

L. DEMING TILTON, B.S., Lecturer in Architecture and Political Science.

*Letters and Science List.*—Courses 5A, 5B, 5C, 6A, 6B, 6C, 14, 113, 114, 117, and 120A-120B are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

## 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.)

Students with junior standing will be allowed, under exceptional circumstances only, to take the following courses concurrently, if granted permission by the faculty: courses 1 and 2; 1 and 3; 3 and 4.

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: Orthographic Projection. (3) I and II. Mr. STUMP, Mr. LAGORIO  
Six hours weekly. Lecture and drafting practice.  
Prerequisite: solid geometry.

\* In residence spring semester only, 1948-1949.

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. ———  
Eight hours weekly.  
Prerequisite: courses 1, 2, and 3.
- 5A. Architecture of Ancient and Classic Times. (2) II. Mr. JORY
- \*5B. Architecture of the Dark Ages and the Middle Ages. (2) II. Mr. MOÏSE
- 5C. Architecture of the Renaissance. (2) I. Mr. PERRY
- 6A. Classwork in Ancient and Classic Architecture. (1) II.  
Mr. MOÏSE, Mr. DOWNS
- \*6B. Classwork in Medieval Architecture. (1) II. Mr. JORY, Mr. DOWNS
- 6C. Classwork in Renaissance Architecture. (1) I.  
Mr. JORY, Mr. DOWNS, Mr. MOÏSE
12. Rendering in Water Color. (1) I and II.  
Mr. GOODMAN, ———, Mr. RICE  
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, ———  
Three hours weekly. Two sections to be given.  
Prerequisite: Art 2A or equivalent.
14. Elements of Sculpture. (2) I and II. Mr. O'HANLON  
Six hours weekly. Four sections.
18. Introduction to Architecture. (1) I and II. Mr. PERRY, Mr. MOÏSE  
Lectures for beginning students in architecture; drafting practice.  
Prerequisite: Architecture 1 or equivalent.

## 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. RICE  
Prerequisite: courses 1, 2, 3, and 4.  
Ten hours weekly.
- 102A-102B. Design and Theory: Senior Problems. (5-5) Yr. Beginning each semester.  
Mr. MOÏSE, Mr. PERRY, ———  
Prerequisite: course 101A-101B.  
Ten hours weekly.
- †102C-102D. Design and Theory. (5-5) Yr. Beginning each semester.  
Prerequisite: course 101A-101B. Mr. MOÏSE  
Ten hours weekly.

\* Not to be given, 1948-1949.

† To be given if a sufficient number of students enroll.

- 108A-108B. Architectural Mechanics. (3-3) Yr. Mr. GAYNER  
Prerequisite: Physics 4A-4B. Lectures.
110. The House. (1) I and II. Mr. GOODMAN, Mr. JEANS
112. Advanced Water-Color Rendering. (1) I and II. Mr. JORY  
Prerequisite: course 12 (2 units).  
Three hours weekly.
113. Sculptural Design. (2) II. Mr. SCHNIER  
Prerequisite: course 14 (2 semesters), or course 114 (1 semester).  
Six hours weekly.
114. The Human Figure in Sculpture. (2) I and II. Mr. O'HANLON  
Prerequisite: course 14 (2 semesters), or course 1 and 14 (1 semester).  
Six hours weekly.
115. Rendering in Pencil. (1) I and II. ———  
Prerequisite: Architecture 13 (2 units).  
Three hours weekly.
117. Introduction to Housing and Planning. (3) I and II. Mr. MOÏSE  
Occasional seminars and field trips as arranged.  
Prerequisite: senior standing.
- 120A-120B. Introduction to City and Regional Planning. (1-1) Yr.  
Prerequisite: junior standing. Mr. TILTON  
NOTE.—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: course 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.  
121A is not prerequisite to 121B.
- †199. Special Study for Advanced Undergraduates. (1-5) I and II.  
By arrangement only. The STAFF (Mr. PERRY in charge)

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

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.

† To be given if a sufficient number of students enroll.

- †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 coordinated with course 200 and must be taken with it.
208. Seminar in Architecture. (3) II. Mr. PERRY  
For candidates for the degree of Master of Arts only.
209. Seminar in Professional Practice. (2) II. Mr. JEANS  
Prerequisite: courses 200, 207, and graduate standing.  
A course in specification writing, professional practice, and business relations.
- †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

- Laboratory Physics. (Physics 2A-2B, 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.)

† To be given if a sufficient number of students enroll.

## ART

JOHN HALEY, Professor of Art.

WALTER W. HORN, Ph.D., Professor of Art.

ERLE LORAN, Professor of Art.

OTTO J. MAENCHEN, Ph.D., Professor of Art.

EUGEN NEUHAUS, Ph.D. (hon.c.), Professor of Art.

STEPHEN C. PEPPER, Ph.D., Professor of Philosophy and Aesthetics (Chairman of the Department of Art).

† WORTH RYDER, Professor of Art.

OLIVER M. WASHBURN, A.B., Professor of the History of Art, Emeritus.

RAY S. BOYNTON, Associate Professor of Art, Emeritus.

CHIURA OBATA, Associate Professor of Art.

MARGARET P. O'HAGAN, M.A., Associate Professor of Art.

GLENN WESSELS, M.A., Associate Professor of Art.

DARRELL A. AMYX, Ph.D., Assistant Professor of Art.

JAMES MCCRAY, M.A., Assistant Professor of Art.

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JOHN W. LOCKWOOD, Lecturer in Art.

*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 83.

*Departmental Major Advisers:* Appreciation and Practice of Art: Mr. WESSELS, 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 the History of Art. Recommended for prospective majors in the 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.

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 the 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

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† Sabbatical leave in residence fall semester, 1948-1949.



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 (if possible) examples of their work so as to assist the department in reaching a judgment as to their capacity to profit from immediate enrollment in these courses.

Students who qualify will sometimes 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 Painting. (3) II. Mr. RYDER  
Lectures and two weekly section meetings to be arranged.
- 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) I and II. Mr. OBATA
19. The Appreciation of Art. (1) II. Mr. NEUHAUS

#### 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. Mr. NEUHAUS  
Representational composition based upon out-of-door subjects in any medium.
102. Advanced Drawing and Painting. (2) II. 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 and II. Mr. HALEY
105. Advanced Drawing and Painting. (2) I and II. Mr. LORAN
106. Advanced Drawing and Painting. (2) I and II. Mr. MCCRAY
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) I and II. Mr. OBATA
113. Advanced Drawing and Painting. (2) I and II. Mr. WESSELS

#### 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 Art 1B.  
Study of the relation between artist and critic in the visual arts, with some practical experience in criticism.
168. Community Art. (2) I. Mr. NEUHAUS  
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.

\* Not to be given, 1948-1949.

- 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 Chinese Art. (2-2) Yr. Mr. MAENCHEN  
 Prerequisite: upper division standing.  
 From 2000 B.C. to the present.
161. The Art of India. (3) II. Mr. MAENCHEN  
 Prerequisite: upper division standing.
169. History of American Art. (3) I and II. Mr. NEUHAUS  
 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 practical work or equivalent, taken at another  
 university. May not be repeated for credit.
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
 The STAFF (Mr. WESSELS in charge)  
 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 156.

254. Seminar in Ancient Art. (2) I. 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. The STAFF (Mr. NEUHAUS in charge)  
 Two hours weekly, to be arranged.  
 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 pre-  
 cede 269A.

\* Not to be given, 1948-1949.

285. Seminar in the History of Early Christian and Medieval Art. (2) I and 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. HORN 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).

WILLIAM F. MEYER, Ph.D., Professor of Astronomy.

ROBERT J. TRUMPLER, Ph.D., Professor of Astronomy.

R. TRACY CRAWFORD, Ph.D., Professor of Astronomy and Director of the Students' Observatory, Emeritus.

ARMIN O. LEUSCHNER, Ph.D., Sc.D., LL.D., Professor of Astronomy 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 83.

*Departmental Major Advisers:* Mr. EINARSSON, Mr. TRUMPLER.

*Preparation for the Major.*—Physics 4A-4B-4C or their equivalent; Mathematics 3A-3B, 4A-4B, or their 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 or 119A-119B, 120A; Physics 104A, 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. MEYER, 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) 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 Elementary Practical Astronomy. (1) I. 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. Mr. CUNNINGHAM  
 Two lectures and one three-hour laboratory or observing period weekly.  
 Prerequisite: Mathematics 3A (may be taken concurrently).  
 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. Enrollment limited to twenty-four students.

10. Nautical Astronomy. (3) I and II. Mr. MEYER  
 Prerequisite: plane trigonometry.  
 Piloting; the sailings; the line of position.

11. Nautical Astronomy. (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, Miss PILLANS  
 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 con-  
 currently with 104A.

107. Method of Least Squares. (2) I. Mr. EINARSSON  
 Adjustment of observations with applications to astronomy, plane and  
 geodetic surveying.

108. Computing. (3) I. Mr. CUNNINGHAM  
 Theory and practice of computing and reduction of observations. Inter-  
 polation, numerical differentiation and integration. Limited to twelve  
 students.

114. Practical Astronomy for Engineers. (3) I. Mr. EINARSSON  
 Lectures, computing, and two hours of astronomical observation.  
 Prerequisite: Astronomy 3 and plane surveying (Engineering 1A-1B).  
 Precise determination of latitude, time, and longitude.

115. Introduction to Theoretical Astronomy. (3) II. Mr. CUNNINGHAM  
 Prerequisite: Astronomy 108.  
 Elementary theory of orbits, with emphasis on practical computation.

- 117A-117B. Introduction to Astrophysics. (3-3) Yr. Mr. HENYEF  
 A laboratory period will occasionally be substituted by appointment for  
 one of the regular periods.  
 Prerequisite: Astronomy 7A-7B or consent of the instructor.

199. Special Study for Advanced Undergraduates. (1-3) I and II.  
 The STAFF (Mr. TRUMPLER in charge)

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

- 215A-215B. Theoretical Astronomy. (3-3) Yr. Mr. CUNNINGHAM  
Prerequisite: Astronomy 115.  
Various orbit methods. Special perturbations. Introduction to general perturbations and celestial mechanics.
- \*217A-217B. Astrophysics. (3-3) Yr. Mr. HENYEV  
Prerequisite: Astronomy 117A-117B.  
The physics of stellar atmospheres.
- 218A-218B. Statistical Astronomy. (3-3) Yr. Mr. TRUMPLER
- \*225A-225B. Advanced Theoretical Astronomy. (3-3) Yr. Mr. CUNNINGHAM
- 227A-227B. Advanced Astrophysics. (3-3) Yr. Mr. HENYEV  
Prerequisite: course 117A-117B.  
A. The internal structure of stars, sources of energy.  
B. The physical properties of nebulae and interstellar matter.
299. Advanced Study and Research. (1-4) I and II.  
The STAFF (Mr. TRUMPLER 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 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 the Graduate Division at Berkeley, or the Director of the Lick Observatory, Mount Hamilton, Santa Clara County, California.

\* Not to be given, 1948-1949.

## BACTERIOLOGY

†A. P. KRUEGER, A.B., M.D., Professor of Bacteriology.

MICHAEL DOUDOROFF, Ph.D., Associate Professor of Bacteriology.

SANFORD S. ELBERG, Ph.D., Associate Professor of Bacteriology (Chairman of the Department).

ROGER Y. STANIER, Ph.D., Associate Professor of Bacteriology.

JACOB FONG, Ph.D., Instructor in Bacteriology.

JACOB DAVID TAK, Associate in Bacteriology.

JOHN ENRIGHT, Ph.D., Lecturer in Bacteriology.

EDWIN H. LENNETTE, M.D., Ph.D., Lecturer in Bacteriology.

ERNST LOEWENSTEIN, M.D., Lecturer in Bacteriology.

HORACE A. BARKER, Ph.D., Professor of Soil Microbiology.

REESE H. VAUGHN, Ph.D., Associate Professor of Food Technology.

*Letters and Science List.*—All undergraduate courses in bacteriology (except 199 at Davis) are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

*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 1A, 1C; 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, 104; and at least 12 units chosen from the following list with the approval of the department: (In special cases, substitutions may be permitted.) Course 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.

*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. General Introductory Bacteriology and Microbiology. (5) II.

Lectures and laboratory.

Mr. DOUDOROFF, Mr. STANIER

Prerequisites: Chemistry 1A and 8; a semester course in botany, zoölogy, or physiology (Botany 1 or 12; Zoölogy 1A or 10; Physiology 1A) 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.

† Sabbatical leave in residence, 1948-1949.



## 2. General Bacteriology. (4) II.

Mr. DOUDOROFF, Mr. ELBERG, Mr. STANIER, Mr. FONG

Lectures and laboratory.

Prerequisite: Chemistry 1A.

Designed especially for students who are not majoring in bacteriology.

## 4. General Bacteriology (Laboratory). (2) II.

Mr. DOUDOROFF, 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.)

## 31. Survey of General Bacteriology. (3) II.

Mr. DOUDOROFF, Mr. ELBERG, Mr. FONG, Mr. STANIER

Lectures for course 2 and one three-hour demonstration period a week.

Prerequisite: Chemistry 1A.

Designed primarily for preoptometry and sanitary engineering 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. ELBERG, Mr. FONG

Enrollment limited to seventy-two students who will be selected on the basis of scholastic standing, major field, and year of residence.

Prerequisite: course 1 or 2.

Lectures, demonstrations, and laboratory.

## 102. Immunology, the Dynamics of Infection and Resistance. (4) II.

Mr. ELBERG

Prerequisite: course 101, Chemistry 8. A reading knowledge of French or German is recommended. Enrollment limited to eight 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. DOUDOROFF, Mr. STANIER

Prerequisite: courses 1 and 2, Biochemistry 103 or Botany 122.

## 104. Advanced General Microbiology. (4) I.

Mr. DOUDOROFF, Mr. STANIER

Prerequisite: course 1, Biochemistry 103 or Botany 122, 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. Enrollment in the year 1948-1949 limited to eight students who will be selected by the instructors.

## 105. Technical Microbiology. (3) I.

Mr. STANIER, Mr. VAUGHN

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.
107. Introduction to Medical Microbiology, Parasitology, and Immunology. (4) II.  
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. DOUDOROFF, Mr. ELBERG, Mr. FONG, Mr. STANIER, Mr. VAUGHN

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

201. Special Study and Research in Problems of Medical, General, or Technical Bacteriology, and Experimental and Comparative Pathology. I and II.  
Credit according to the work completed.  
Mr. KRUEGER, Mr. BARKER, Mr. DOUDOROFF, Mr. ELBERG, Mr. FONG, Mr. STANIER
205. Seminar. (1) I and II.  
Mr. DOUDOROFF, Mr. ELBERG, Mr. FONG, Mr. STANIER

## BIOCHEMISTRY

## 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 Division) and Director of the Virus Laboratory.

EDWARD S. SUNDSTROEM, M.D., Professor of Biochemistry, Emeritus.

FRANK W. ALLEN, Ph.D., Associate Professor of Biochemistry.

HAROLD TARVER, Ph.D., Assistant Professor of Biochemistry.

EDWARD L. DUGGAN, Ph.D., Instructor in Biochemistry.

MAX SCHLAMOWITZ, Ph.D., Instructor in Biochemistry.

<sup>1</sup> HAMILTON H. ANDERSON, M.D., Professor of Pharmacology.

C. ARTHUR KNIGHT, Ph.D., Associate Professor of Biochemistry, Virus Laboratory.

CHARLES H. HINE, M.D., Assistant Professor of Pharmacology and Toxicology.

CHOH H. LI, Ph.D., Associate Professor of Experimental Biology.

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 83.

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 1A, 1C or Zoölogy 1A-1B. Recommended: Chemistry 9, 107, 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, 8, 9, or 12A-12B and 109 or 110A-110B; Physics 2A-2B, 3A-3B; Mathematics 11A-11B or 3A-3B, 4A; Physiology 1A, 1C or Zoölogy 1A-1B. Recommended: Bacteriology 1 and 4; Botany 12; a reading knowledge of German; a course in statistics.

<sup>1</sup> In residence fall semester only, 1948-1949.

*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. ALLEN, Mr. TARVER, and Assistants

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. KIRK, Mr. DUGGAN, Mr. SCHLAMOWITZ, and Assistants

Prerequisite: Chemistry 8 with a grade of C or higher. Recommended: Chemistry 5, Zoölogy 1A-1B or Physiology 1A, 1C, 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.

NOTE.—The student is advised to take courses 103 and 104 simultaneously if possible.

## 104. Animal Biochemistry. Laboratory only. (4) II.

Mr. DUGGAN and Assistants

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 and the STAFF

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 and the STAFF

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, physical chemical properties, and mechanism of action of enzymes and their role in metabolic processes.

## 106A. Protein Chemistry Laboratory. (2) I.

Mr. SCHLAMOWITZ

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. (2) 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.
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.
115. The Mechanism of Drug Action. (3) I. Mr. ANDERSON and Assistants  
(Formerly numbered 109.)  
Prerequisite: course 103 with a grade of C or higher. Recommended: Physiology 100A-100B.  
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.
116. The Mechanism of Drug Action. Laboratory. (1) I. Mr. ANDERSON and Assistants  
(Given at the Medical Center in San Francisco.)  
Prerequisite: course 115 or an equivalent course in pharmacology. This may be taken simultaneously. To be given if ten students enroll.
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: 101M (or 103, 104) and 110; or 105A, 105B, and 106A-106B; or 107 or 108.  
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 156.

201. Selected Topics in Biochemistry. (1) II. Mr. KNIGHT  
 Open to senior students with honor standing by consent of the instructor.  
 Biochemistry of the viruses.  
 Intended to acquaint advanced students with recent advances made in  
 the different fields of biochemistry. Selected topics will be alternated from  
 year to year.
212. Graduate Seminar. (1) I and II. The STAFF (Mr. GREENBERG in charge)  
 Prerequisite: completion of the major in biochemistry.
280. Research in Biochemistry. I and II.  
 (Formerly numbered 210.) The STAFF (Mr. GREENBERG in charge)  
 Not less than 4 units except by special permission of the chairman of  
 the division.
299. Special Study for Graduate Students. (1-3) I and II.  
 The STAFF (Mr. GREENBERG in charge)  
 Reading and conference for properly qualified graduate students under  
 the direction of a member of the staff.

## 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), 107 (3), 109 (3), 110A-  
 110B (6), 111 (3), 114H (3).  
 Home Economics 120A (4), 120B (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.

<sup>2</sup>ADRIANCE S. FOSTER, Sc.D., Professor of Botany.

THOMAS H. GOODSPEED, Ph.D., Doctor (hon.c.) La Plata, Sc.D. (hon.c.), Professor of Botany and Director of the Botanical Garden.

DENNIS R. HOAGLAND, M.A., Professor of Plant Nutrition.

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.

GEORGE F. PAPPENFUSS, 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.

JAMES P. BENNETT, Ph.D., Professor of Plant Physiology.

WALTER H. DORE, B.S., Professor of Plant Nutrition.

WILLIAM Z. HASSID, Ph.D., Professor of Plant Nutrition.

EMIL M. MRAK, Ph.D., Professor of Food Technology.

DANIEL I. ARNON, Ph.D., Associate Professor of Plant Nutrition.

GORDON MACKINNEY, Ph.D., Associate Professor of Food Technology.

WILLIAM C. SNYDER, Ph.D., Associate Professor of Plant Pathology.

PAUL K. STUMPF, Ph.D., Assistant Professor of Plant Nutrition.

SPENCER W. BROWN, Ph.D., Assistant Professor of Genetics.

LOUIS JACOBSON, Ph.D., Assistant Professor of Plant Nutrition.

<sup>1</sup>ERNEST M. GIFFORD, A.B., Lecturer in Botany.

<sup>2</sup>HILDA E. HIRSCH, Ph.D., Lecturer in Botany.

*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 83.

*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

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

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  
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 Botany 12.
12. Introduction to the Structure and Function of Plants. (4) II.  
Mr. PAPPENFUSS, Mr. MACHLIS, Mr. PROSKAUER  
Lectures and demonstration periods. Not open for credit to students who have had course 1. Designed primarily for students who desire a general acquaintance with the fundamentals of botany. Not open to students who have completed Botany 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. GIFFORD  
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. Mrs. HIRSCH  
Prerequisite: course 14.  
The structure and development of the fungi. Myxomycetes, Phycomycetes, and Ascomycetes. Lectures and laboratory.
102. Mycology. (4) I. Mr. BONAR  
Lectures and laboratory.  
Prerequisite: course 14. Course 101 recommended but not required.  
Fungi Imperfecti and Basidiomycetes.

\* Not to be given, 1948-1949.



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. PAPPENFUSS  
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.)  
Biology of Yeast. (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  
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.

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\* Not to be given, 1948-1949.

- \*120B. Advanced Plant Physiology. (2) II. \_\_\_\_\_  
Prerequisite: course 120A. If possible course 121B should be taken concurrently. A continuation of course 120A.
- \*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, Mr. DORE, Mr. HOAGLAND  
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. GOODSPEED  
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.)

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\* Not to be given, 1948-1949.

## 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) I. Mr. GOODSPEED, Mr. GIFFORD  
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

- See page 156 of this bulletin concerning conditions for admission to graduate courses.
- 201A-201B. Research. Yr. The STAFF (Mr. MASON 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
204. Seminar in Plant Cytology. (1) II. Mr. GOODSPEED
- 205A. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.  
Mr. CONSTANCE, Mr. MASON

## 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.

<sup>2</sup> 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 KERE, Ph.D., Professor of Industrial Relations.

PERRY MASON, Ph.D., C.P.A., Professor of Accounting.

ALBERT H. MOWBRAY, A.B., Fellow of the Actuarial Society of America, Professor of Insurance.

† LEONARD A. DOYLE, Ph.D., C.P.A., Associate Professor of Accounting.

ROY W. JASTRAM, Ph.D., Associate Professor of Business Administration.

VAN DUSEN KENNEDY, Ph.D., Assistant Professor of Industrial Relations.

FRANK L. KIDNER, Ph.D., Associate Professor of Economics.

MAURICE MOONITZ, Ph.D., C.P.A., Associate Professor of Accounting.

ROYAL A. ROBERTS, M.B.A., Associate Professor of Business Administration.

ARTHUR M. ROSS, 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.

PHILIP B. BERGFELD, J.D., Assistant Professor of Commercial Law.

JOHN P. CARTER, Ph.D., Assistant Professor of Business Administration.

CATHARINE DE MOTTE QUIRE, Ph.D., Assistant Professor of Accounting.

PAUL F. WENDT, Ph.D., Assistant Professor of Finance.

F. THEODORE MALM, Ph.D., Instructor in Business Administration.

DOW VOTAW, M.B.A., Instructor in Commercial Law.

DONALD A. CORBIN, M.B.A., Associate in Accounting.

HAROLD FURST, M.B.A., Associate in Business Administration.

WILLIAM F. JACKSON, M.B.A., Associate in Accounting.

WILLIAM F. TAUCHAR, A.B., Associate in Business Administration.

LESLIE E. CARBERT, M.A., Lecturer in Economics.

LEONARD E. CHADWICK, M.S., Lecturer in Accounting.

ALFRED S. CLEVELAND, Ph.D., Lecturer in Business Administration.

JAMES A. CRUTCHFIELD, JR., M.A., Lecturer in Business Administration.

DONALD A. FERGUSSON, M.B.A., Lecturer in Finance.

NELL T. HOUSTON, M.A., Lecturer in Business Administration.

OLOF LUNDBERG, C.P.A., Lecturer in Accounting.

<sup>2</sup> In residence spring semester only, 1948-1949.

† Sabbatical leave in residence, 1948-1949.

- PAUL W. MCGANN, A.B., Lecturer in Business Administration.  
 SHERMAN J. MAISEL, M.P.A., Lecturer in Business Administration.  
 FREDERICK T. MOORE, M.A., Lecturer in Economics.  
 FRANK E. NORTON, JR., A.B., Lecturer in Business Administration.  
 DAVID A. REVZAN, Ph.D., Lecturer in Marketing.  
 CHARLES R. RINGO, M.S., LL.B., C.P.A., Lecturer in Business Administration.  
 WILLIAM K. SCHMELZLE, B.S., M.B.A., Lecturer in Business Administration.  
 FRANKLIN C. STARK, J.D., Lecturer in Commercial Law.

The requirements for the curriculum in the School of Business Administration are listed on page 121.

*Letters and Science List.*—Courses 6A, 6B, 10, 107, and 151 are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

#### LOWER DIVISION COURSES

- 6A-6B. Principles of Accounting. (3-3) Yr. Beginning each semester.  
 Mr. CHADWICK, Mr. CORBIN, Mr. JACKSON, Mr. MASON, Mr. MOONITZ  
 Two lectures and one two-hour laboratory section weekly to be arranged.  
 Prerequisite: at least sophomore standing. 6A is a prerequisite to 6B.  
 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 have taken or who are planning to take course 6A-6B.  
 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, 40, and junior standing except where special provision has been made for students in certain curricula.

107. Economics of Enterprise. (3) I and II.  
 Mr. CARBERT, Mr. CARTER, Mr. CHADWICK, Mr. CLEVELAND, Mr. CRUTCHFIELD, Mr. HOUSTON, Mr. JASTRAM, Mr. MCGANN, Mr. MAISEL, Mr. MOORE, Mr. NORTON, Mr. TAUCHAR  
 Not open to students taking Economics 100A. Primarily for juniors.
108. Business Fluctuations and Forecasting. (3) I and II.  
 Mr. CARBERT, Mr. CARTER, Mr. CRUTCHFIELD, Mr. FERGUSON, Mr. GORDON, Mr. MCGANN, Mr. MAISEL, Mr. TAUCHAR  
 Prerequisite: course 107.  
 Not open to students who have taken Economics 103.
118. Advanced Commercial Law. (3) I and II.  
Mr. BERGFELD, Mr. STARK, Mr. VOTAW  
 Primarily for upper division students in the School of Business Admin-

- istration, but also open to other upper division students. The work is based on the study of important cases. Students are advised to complete course 18 or to obtain a substantial knowledge of contracts before registering.
120. Business Organization and Management. (3) I and II.  
 Primarily for juniors. Mr. CLEVELAND, Mr. FURST, Mr. SCHMELZLE  
 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.
121. Management Problems and Policies. (3) I and II. Mr. CLEVELAND  
 Prerequisite: senior standing and courses 107, 120, and 123. Recommended: courses 134 and 151.
123. Marketing. (3) I and II.  
 Mr. CRUTCHFIELD, Mr. HOUSTON, Mr. NORTON, Mr. REVZAN, Mr. ROBERTS
- 124A-124B. Retail Store Management. (3-3) Yr. Mr. ROBERTS  
 Prerequisite: course 123.
125. Advertising. (3) I. Mr. ROBERTS  
 Prerequisite: course 123.  
 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.
126. Sales Analysis and Sales Management. (3) I. Mr. ROBERTS  
 Prerequisite: course 123.
127. Production Planning and Control. (3) I and II. Mr. SCHMELZLE  
 Prerequisite: course 120; recommended: course 128.
128. Industrial Procurement. (3) II. Mr. ROBERTS  
 Prerequisite: course 123.
129. Advertising Policy. (3) II. Mr. JASTRAM  
 Prerequisite: courses 123 and 125, or consent of the instructor.  
 Executive consideration of advertising in relation to price policy and the competitive problems of the firm.
133. Investments. (3) I and II. Mr. WENDT  
 Prerequisite: course 134.
134. Corporation Finance. (3) I and II.  
 Prerequisite: course 6A-6B. Mr. CRUM, Mr. FERGUSON, Mr. WENDT  
 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.

136. Foreign Exchange. (3) I. Mr. CROSS  
Prerequisite: Economics 135.
144. Life Insurance. (3) I. Mr. MOWBRAY  
Prerequisite: Economics 143.  
A nontechnical study of principles and practice.
145. Property Insurance. (3) II. Mr. MOWBRAY  
Prerequisite: Economics 143.
146. Casualty Insurance. (3) II. Mr. MOWBRAY  
Prerequisite: Economics 143.
151. Industrial Relations. (3) I and II. Mr. KENNEDY, Mr. KERR, Mr. ROSS  
Students will not receive credit for both Economics 150A and course 151.  
Background of the problems faced by management in the field of industrial relations and labor legislation with an introduction to personnel administration.
153. Personnel Administration. (3) I and II. Mr. MALM  
Prerequisite: course 151 or Economics 150A, or consent of the instructor.
154. Collective Bargaining Systems. (3) I and II.  
Mr. KENNEDY, Mr. KERR, Mr. ROSS  
Prerequisite: course 151 or Economics 150A.  
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.
155. Labor Law. (3) I and II. Mr. DAVISSON  
Prerequisite: course 151 or Economics 150A and course 154.  
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.
- 160A-160B. Advanced Accounting. (3-3) Yr. Beginning each semester.  
Mr. MOONITZ, Mr. STAEHLING, Mr. VANCE  
A two-hour laboratory period to be arranged. Prerequisite: course 6A-6B, with average grade not lower than C. Course 160A with at least a C average is prerequisite to course 160B.
161. Cost Accounting. (3) I and II. Mr. VANCE  
Lectures, and a two-hour laboratory period to be arranged.  
Prerequisite: course 6A-6B, with an average grade not lower than C; course 160A is recommended.
162. Auditing. (3) I and II. Mr. VANCE  
Lectures, and a two-hour laboratory period to be arranged.  
Prerequisite: courses 6A-6B, 160A.
163. Budgetary Control and Accounting Systems. (3) I. Mr. VANCE  
Prerequisite: courses 6A-6B, 160A-160B, 161.

164. Governmental and Institutional Accounting. (2) I and II.

Mr. LUNDBERG

Prerequisite: courses 6A-6B, 160A-160B, or consent of the instructor.

166. Analysis of Financial Statements. (3) I.

Mr. STAEBLING

Lectures, and a two-hour laboratory period to be arranged.

Prerequisite: courses 6A-6B, 160A-160B with at least a C average and consent of the instructor.

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 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.

Mr. MAISEL, Mr. WENDT

The nature of real property; the principles of urban land utilization; classification of property rights; urban development; real property valuation; 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.

183. Real Estate Law. (3) II.

Mr. BERGFELD

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.

- 198A-198B. Directed Group Study. (1-3; 1-3) Yr.

The STAFF (Mr. GREETHER, Mr. MASON in charge)

- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr.

The STAFF (Mr. GREETHER, Mr. MASON in charge)

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

221. Seminar in Business Policy. (3) I and II.

Mr. SCHMELZLE

- 223A-223B. Seminar in Marketing. (3-3) Yr.

Mr. GREETHER, Mr. REVZAN

I: Mr. Revzan; II: Mr. Grether.

226. Advanced Marketing. (3) I and II.

Mr. REVZAN

Prerequisite: course 123 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 Business Administration 223A-223B, Seminar in Marketing.



234. Problems of Business Finance. (3) I and II. Mr. CRUM
236. Seminar in Money and Credit. (3) II. Mr. CROSS  
Prerequisite: course 136 and Economics 135.
242. Business Investigations and Analysis. (3) I and II. Mr. REVZAN
243. Seminar in Insurance. (3) I. Mr. MOWBRAY
251. Seminar in Industrial Relations. (3) II. Mr. KERR
- 260A-260B. Seminar in Accounting Theory. (2-2) Yr.  
Prerequisite: course 160A-160B. Mr. MASON, Mr. MOONITZ  
I: Mr. Mason; II: Mr. Moonitz.
- 261A. Advanced Accounting Problems. (3) I and II.  
Mr. MOONITZ, Mr. STAEHLING  
Prerequisite: courses 160A-160B and 161.  
I: Mr. Moonitz; II: Mr. Staehling.
- 261B. Advanced Cost Accounting. (3) I and II. Mr. DOYLE  
Prerequisite: courses 160A-160B and 161. 261A is not a prerequisite  
for 261B.
- \*264. Specialized Accounts. (2) I. Mr. VANCE
269. Income Tax Procedure. (3) I and II. Mr. MASON, Mr. RINGO  
Prerequisite: course 160A-160B.  
I: Mr. Ringo; II: Mr. Mason.  
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.
- 270A. Seminar in Transportation. (2) I. Mr. DAGGETT
297. Research in Business Problems. (1-6) I and II.  
The STAFF (Mr. GREETHER, Mr. MASON in charge)  
I: Mr. Mason; II: Mr. Grether.  
Primarily for candidates for the degree of Master of Business Adminis-  
tration.

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\* Not to be given, 1948-1949.

## CHEMISTRY

- 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.  
WENDELL M. LATIMER, Ph.D., Professor of Chemistry (Chairman of the Department).  
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.  
<sup>1</sup> ROBERT E. CONNICK, Ph.D., Associate Professor of Chemistry.  
BURRIS B. CUNNINGHAM, Ph.D., Associate Professor of Chemistry.  
GEORGE JURA, Ph.D., Associate Professor of Chemistry.  
EDWIN F. ORLEMANN, 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.  
WILLIAM G. DAUBEN, Ph.D., Assistant Professor of Chemistry.  
WILLIAM D. GWINN, Ph.D., Assistant Professor of Chemistry.  
DONALD N. HANSON, Ph.D., Assistant Professor of Chemical Engineering.  
RICHARD E. POWELL, Ph.D., Assistant Professor of Chemistry.  
HENRY RAPOPORT, 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.  
MARSHALL W. CRONYN, Ph.D., Instructor in 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.  
THOMAS R. SIMONSON, Ph.D., Instructor in Chemistry.  
DAVID H. TEMPLETON, Ph.D., Instructor in Chemistry.  
F. CAMPBELL WILLIAMS, Ph.D., Instructor in Chemical Engineering.

<sup>1</sup> In residence fall semester only, 1948-1949.

CHARLES W. KOCH, B.S., Associate in Chemistry.  
D. THOMAS STANTON, JR., M.S., Associate in Chemistry.

ISADORE PERLMAN, Ph.D., Associate 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 149H are included in the Letters and Science List. For regulations governing this list, see page 83.

*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 96) 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. For certain purposes involving less extensive advanced work than the normal major, the shorter course in physics (2A-2B, with or without 3A-3B), may be accepted for Physics 4A, 4B, 4C.

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. PITZER,  
MR. BREWER, MR. CONNICK, MR. JURA, MR. POWELL, MR. ZIMM,  
MR. GWINN, MR. ROLLEFSON, MR. MCCLURE, MR. O'KONSKI, MR.  
TEMPLETON

I and II: Lectures (Mr. Hildebrand, Mr. Latimer).

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. POWELL, MR. TEMPLETON, MR. ZIMM

Lectures (Hildebrand).

Prerequisite: course 1A.

##### 5. Quantitative Analysis. (3) I and II.

MR. OLSON, MR. KOCH, MR. ORLEMANN, MR. SIMONSON, MR. GUFFY

Lecture and laboratory.

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. CASON, MR. CRONYN, MR. RAPOPORT  
Lectures and laboratory work designed for students whose major is chemistry.

Prerequisite: course 1B with a grade of C or higher.

##### 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) I. Mr. LATIMER  
Prerequisite: course 5.  
The interpretation and correlation of inorganic reactions.
105. Advanced Quantitative Analysis. (3) II. Mr. ORLEMANN  
Lectures and laboratory.  
Prerequisite: course 5.
109. Physical Chemistry—Brief Course. (3) I. Mr. JURA  
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. GWINN, Mr. ROLLEFSON  
110A. I: Mr. Gwinn; II: Mr. Rollefson.  
110B. I: Mr. Rollefson; II: Mr. Gwinn.  
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. Mr. DAUBEN  
Prerequisite: courses 5 and 12B.
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. STANTON, Mr. ZIMM  
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. PITZER, Mr. BREWER  
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  
Prerequisite: courses 5, 104 or 105, and 109 or 110B.
122. Phase Rule. (2) I. Mr. BREWER, Mr. PERLMAN  
Prerequisite: course 109 or 110B.
123. Nuclear Chemistry. (2) I. Mr. SEABORG  
Prerequisite: senior standing.
- 180H. Research. (2-15) I and II. The STAFF (Mr. LATIMER in charge)  
Prerequisite: Chemistry 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. LATIMER in charge)  
Laboratory work for advanced undergraduates.
199. Special Study for Advanced Undergraduates. (2-3) I and II.  
The STAFF (Mr. LATIMER 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 96.

143. Introduction to Chemical Engineering. (3) I and II. Mr. WILLIAMS  
Prerequisite: course 109 or 110A (with consent of the instructor, 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. Mr. VERMEULEN  
Prerequisite: course 110B.  
Thermal properties; behavior of gases; vaporization and condensation; solutions; critical phenomena; reaction energetics and equilibria.
- 145A-145B. Unit Operations Laboratory. (2-2) Yr. Beginning either semester. Mr. HANSON, Mr. TOBIAS, Mr. WILLIAMS  
Prerequisite: courses 143, 146A-146B (which 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. BROMLEY  
Prerequisite: courses 110B, 143 (may be taken concurrently).  
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. BROMLEY  
Prerequisite: course 146A or equivalent, or courses 114H and 143.  
Diffusional operations: absorption, extraction, humidification, drying. Fractional distillation. Filtration, crushing and grinding, mechanical separation.
147. Organic Chemical Unit Processes. (3) II. Mr. STEWART, Mr. VERMEULEN  
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.
- 149H. Design of Chemical Process Plants. (3) II. Mr. WILKE  
Prerequisite: courses 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) II. 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). Mr. RAPOPORT  
Open to properly qualified graduate students. 207A is not prerequisite to 207B.  
The chemistry of heterocyclic compounds, including the alkaloids.

\* Not to be given, 1948-1949.

- 207c. Organic Chemistry. (2) I. 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. PITZER  
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  
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. LATIMER 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. LATIMER 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. LATIMER 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.

## 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) II. 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. 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.)
- 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, Mr. TUDDENHAM, Mr. SHERRIFFS)
- Clinical Methods. (Psychology 261A, Mr. COFFEY)
- Advanced Clinical Methods. (Psychology 261B, Mr. BALLACHEY)
- Child Psychology. (Psychology 112, Mr. JONES)

\* Not to be given, 1948-1949.

- Laboratory in Adolescent Development. (Psychology 115, Mr. JONES)  
Child Hygiene. (Public Health 125, Mr. COHEN)  
Child Welfare. (Social Welfare 253A-253B, Mrs. FREDERICKSEN)  
Emotional Development of Children.  
(Social Welfare 266A-266B, Mrs. MAENCHEN, Mr. ERIKSON)
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### CIVIC PLANNING

T. J. KENT, JR., A.B., M.C.P., Associate Professor of Civic Planning (Chairman of the Department).

The Department of Civic 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 civic 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.

Full details of the program will be announced later.

## CLASSICS

- LUDWIG EDELSTEIN, Ph.D., Professor of Greek.  
 MURRAY B. EMENEAU, Ph.D., Professor of Sanskrit and General Linguistics.  
 IVAN M. LINFORTH, Ph.D., Professor of Greek (Chairman of the Department).  
 LOUIS ALEXANDER MACKEY, M.A., Professor of Latin.  
 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.  
 JAMES T. ALLEN, Ph.D., Professor of Greek, Emeritus.  
 MONROE E. DEUTSCH, Ph.D., LL.D., Professor of Latin, 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 Classics.  
 BEN L. CHARNY, Ph.D., Assistant Professor of Latin.  
 JOHANNA GOETZL, Ph.D., Instructor in Latin.

JOHN DAVIDSON BEAZLEY, M.A., Litt.D., F.B.A., Sather Professor of Classical Literature, for the spring semester, 1949.

WILLIAM C. HELMBOLD, 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 83.

*Departmental Major Adviser:* Mr. GREEN.

*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. GREEN.

*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. GREEN.

*Preparation for the Major.*—Required: Latin 1, 2, 3 (or the corresponding courses in the high school), 4. Recommended: Greek 1 or 1A-1B.

\* Absent on leave, 1948-1949.

*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

(NOTE.—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) I. Mr. LINFORTH  
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.
38. The Greek and Roman Historians. (2) II. Mr. PRITCHETT  
Lectures on the major classical historians.
- 170B. Classical Archaeology. (2) I. Mr. SMITH  
Vase painting in Greece and Italy in the sixth century 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.
179. Greek Vases and Greek Mythology. (2) II. Mr. BEAZLEY
- 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.
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  
Designed to continue 194 (which will usually be a prerequisite), with lectures and practice in analysis of morphology and syntax. Open to students who, in the opinion of the instructor, are properly qualified.
196. Introduction to Indo-European Comparative Grammar. (3) I. Mr. EMENEAU  
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) I. Mr. EMENEAU  
The social, economic, and political structure of modern India.

## GREEK

(NOTE.—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. LINFORTH, 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. Mr. LINFORTH
102. Plato: *Apology and Crito*. (3) I. Mr. EDELSTEIN
103. Drama. (3) II. Mr. EDELSTEIN
112. Sophocles. (3) II. Mr. LINFORTH
116. Thucydides. (3) I. Mr. LINFORTH
- 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.  
A: Phonology; B: Morphology. Either semester may be taken separately.

\* Not to be given, 1948-1949.

150. Greek Prose Composition. (2) I. Mr. EDELSTEIN  
Prerequisite: Greek 100.
179. Greek Vases and Greek Mythology. (3) II. Mr. BEAZLEY  
This course is constituted by taking Classics 179 plus one hour per week devoted to reading, in the original Greek, of select passages from the lyric poets and some choruses from the Greek plays.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. EDELSTEIN in charge

## LATIN

(NOTE.—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, Mr. GREEN, Mr. CHARNEY,  
Miss GOETZL, Mr. HELMBOLD
2. Elementary Latin Readings. (4) I and II.  
Mr. GREEN, Mr. CHARNEY, Miss GOETZL  
Prerequisite: two years of high school Latin or Latin 1.  
Reading and composition.
3. Vergil. (4) I and II. Mr. SMITH, Mr. CHARNEY  
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 Catullus. (4) I and II. Mr. FONTENROSE, Mr. GREEN  
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  
Catullus; grammar review and composition.
- 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 (e) 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.

(NOTE.—For comparative grammar of Latin and Greek, see Greek 139A-139B.)

105. Livy. (3) I. Mr. GREEN
106. Horace: *Odes and Epodes*. (3) II. Mr. SMITH

107. Cicero: *Tusculan Disputations*. (3) II. Mr. GREEN  
 108. Roman Comedy. (3) I. Mr. FONTENROSE  
 109A-109B. Composition and Sight Reading. (2-2) Yr. Mr. SMITH  
 154. Tacitus. (3) I. Mr. MACKAY  
 156. Juvenal. (3) II. Mr. MACKAY  
 \*166. Latin Verse Composition. (1) I. Mr. SMITH  
 199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 Mr. MACKAY in charge

## SANSKRIT

(NOTE.—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) I and II.  
 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 156.

200. Special Study. (1-5) I and II. Mr. FONTENROSE in charge  
 214A-214B. The Comedies of Aristophanes. (3-3) Yr. Mr. PRITCHETT  
 219A-219B. Republic of Plato. (3-3) Yr. Mr. EDELSTEIN  
 \*241A. Cicero's *Letters*. (3) I. Mr. GORDON  
 243A-243B. Lucretius. (3) Yr. Mr. MACKAY  
 250. Ovid: *Metamorphoses*. (3) II. Mr. FONTENROSE  
 261. Augustine: *The Confessions*. (3) I. Mr. GREEN  
 271A-271B. Advanced Course in Archaeological Method. (2-2) Yr.  
 271A: Numismatics and Vase Painting. Mr. SMITH  
 271B: Numismatics and Terra Cottas.  
 \*273. Problems in Attic Topography. (2) II. Mr. SMITH  
 290A-290B. Advanced Sanskrit. (1-5; 1-5) Yr. Mr. EMENEAU  
 Pali and Prakrit will be studied also.

\* Not to be given, 1948-1949.



## COMPARATIVE LITERATURE

*Committee in Charge:*

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., Associate Professor of Speech and Dramatic Literature.

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; twelve upper division units in each of two literatures, read in the original, or an equivalent competence, tested by examination. Recommended: Dramatic Art 160A-160B, Dramatic Theory; English 44A-44B, Masterpieces of Literature; English 153A-153B, Introduction to the Study of Poetry; 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.

\*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., Instructor in Decorative Art.

ROBERT G. BENSON, A.B., Lecturer in Decorative Art.

JOHN E. FRENCH, M.A., Lecturer in Decorative Art.

ANNA HADWICK GAYTON (ANNA HADWICK GAYTON SPIER), Ph.D., Lecturer in Decorative Art.

†IRMGARD W. JOHNSON, A.B., 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 83.

*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 141 (3); or 142 (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.

\* Absent on leave, 1948-1949.

† In residence fall semester only, 1948-1949.

*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

60A–60B. Theory of Design and Color: Second-Year Problems. (2–2) Yr.  
Mr. ROSENQUIST, Miss NELSON  
Original problems in line, form, and color.

## UPPER DIVISION COURSES

127. Primitive Art. (2) I. Miss NELSON  
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.

166. Principles of Three-dimensional Abstract Design. (3) II. Miss NELSON  
Enrollment limited by laboratory facilities.

Prerequisite: course 16A–16B, and Art 2A and Decorative Art 160A or 160B or equivalent; and consent of the instructor.

Recommended: Art 2B, Architecture 14.

Laboratory problems involving composition in three-dimensional space with lines, planes, masses. Designs to be executed in simple material.

167. Sources of Industrial Design. (2) II. Miss NELSON

Prerequisite: courses 16A–16B, Art 2A and Decorative Art 160A or 160B. Reading and discussion of thought 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  
Either half of this course may be taken independently.

176A–\*176B. Textile Design. (2–2) Yr. Mrs. JOHNSON  
Enrollment limited; preference given to students majoring in decorative art.

Prerequisite or concurrent: courses 16A and 16B, and 175A or 175B. Course 176A is prerequisite to 176B.

Analyses, reconstructions, and experiments on the loom.

\* Not to be given, 1948–1949.

- \*179. Textile Analysis. (2) II.  
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  
Either half of this course may be taken independently.  
193A. From ancient times to 1400.  
193B. 1400 to 1900.
- 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 156.

- Seminar in Decorative Art. (2) I and II.  
The STAFF (Miss GLADDING in charge)
- 294A. American Decorative Art. (2) II. Miss GLADDING  
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
299. Directed Research. (2-4) I and II.  
The STAFF (Mr. WELLINGTON in charge)

\* Not to be given, 1948-1949.

## DRAMATIC ART

FRED O. HARRIS, M.F.A., Associate Professor of Dramatic Art (Chairman of the Department).

SARA HUNTSMAN STURGESS, B.S., Assistant Professor of Dramatic Art, Emeritus.

ROBERT H. CHAPMAN, A.B., Instructor in Dramatic Art.

FREDERIC HANDSCHY, Ph.B., Lecturer in Dramatic Art.

MARQUIS DE BASSECOURT PATTERSON, M.F.A., Lecturer in Dramatic Art.

ALAN R. THOMPSON, Ph.D., Associate Professor of Dramatic Literature and Speech.

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List, except the following: courses 20, 120, 190, 191, 192, and 193. For regulations governing this list, see page 83.

*Departmental Major Adviser:* MR. HARRIS.

*Preparation for the Major.*—Required: courses 10A-10B (3-3), Principles and 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 (exclusive of course 140). In addition, students will be required to complete 6 units of supervised laboratory 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 to 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 to 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 105A-105B (2-2), 109A-109B (2-2), 111A-111B (2-2). French 115A-115B (2-2), 120A-120B (2-2), German 104 (3), 108A (3), 109 (3), Italian 100 (3), Scandinavian 106 (3), Slavic 135 (2).

(D) Recommended Courses: Lower Division: Music 27A-27B (3-3), Classics 34 (2), 35 (2), English 1A-1B (3-3), Speech 2A-2B (3-3). Upper Division: 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 Theater presents a major and a studio series of play productions. These presentations 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. Principles and Theory of Acting. (3-3) Yr. Beginning each semester.  
Mr. HARRIS, Mr. HANDSCHY, Mr. PATTERSON  
Sections are limited to twenty students each, admitted by permission of the instructor.

## UPPER DIVISION COURSES

## Group A. Dramatic Art: Theory and Practice

120. Theory of Stage Design. (3) I and II. ———  
Prerequisite: upper division standing and course 10A-10B.  
Approaches, methods, and materials central to the visual aspects of theater.
130. Advanced Theory of Acting and Directing. Mr. HANDSCHY, Mr. CHAPMAN  
Sections are limited to twenty students.  
Prerequisite: course 10A-10B, and consent of the instructor.
- 130A. Greek Drama. (3) II. Mr. HANDSCHY  
130B. Shakespearean Drama. (3) II. Mr. CHAPMAN  
130C. Seventeenth- and Eighteenth-Century Drama. (3) I.  
Mr. CHAPMAN  
130D. Modern Drama. (3) I. Mr. HANDSCHY
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  
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.  
NOTE.—Not more than 6 units from courses 190, 191, and 192 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  
Sections are limited to twenty students each.  
Prerequisite: courses 10A, 10B, and consent of the instructor.

### Group B. Dramatic Literature and History of Drama

140. Theater Backgrounds. (3) I and II. \_\_\_\_\_  
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.

### 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.  
Greek 103. Drama. (3) II.  
Latin 108. Roman Comedy. (3) I.  
Spanish 105A-105B. Modern Drama: From the Romantic Movement to the  
Present. (2-2) Yr.  
Spanish 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Cen-  
turies. (2-2) Yr.  
Spanish 111A-111B. Cervantes. (2-2) Yr.  
French 115A-115B. Modern French Drama. (2-2) Yr.  
French 120A-120B. The Seventeenth Century. (2-2) Yr.  
German 104. Dramas of the Nineteenth Century. (3) II.  
German 108A. Schiller's Life and Works. (3) I.  
German 109. Goethe's Verse Dramas. (3) II.  
Italian 100. Survey of Modern Drama from Goldoni to the Present. (3) II.  
Scandinavian 106. History of Scandinavian Drama. (3) I.  
Slavic 135. The Russian Drama. (2) II.

NOTE.—The attention of the student is directed to the Group Major in  
Dramatic Literature (see page 73).

## ECONOMICS

- <sup>2</sup> 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.
- <sup>2</sup> ROBERT A. GORDON, Ph.D., Professor of Economics.  
 EWALD T. GRETHEE, Ph.D., Professor of Economics on the Flood Foundation.  
 CHARLES A. GULICK, JR., Ph.D., Professor of Economics.  
 EMILY H. HUNTINGTON, Ph.D., Professor of Economics.  
 MELVIN M. KNIGHT, Ph.D., Professor of Economics.  
 CARL LANDAUER, Ph.D., Professor of Economics.  
 ALBERT H. MOWBRAY, A.B., Fellow of the Actuarial Society of America, Professor of Insurance.
- <sup>2</sup> PAUL S. TAYLOR, Ph.D., Professor of Economics.  
 LUCY W. STEBBINS, A.B., Litt.D., Professor of Social Economics, Emeritus.  
 JOE S. BAIN, JR., Ph.D., Associate Professor of Economics.  
 FRANK L. KIDNER, Ph.D., Associate Professor of Economics (Vice-Chairman of the Department).  
 SANFORD A. MOSE, Ph.D., Associate Professor of Economics.  
 EARL R. ROLPH, Ph.D., Associate Professor of Economics.
- 
- GEORGE F. BREAK, B.Com., Lecturer in Economics.  
 LESLIE E. CARBERT, M.A., Lecturer in Economics.
- <sup>1</sup> GRIFFITH C. EVANS, Ph.D., Professor of Mathematics.  
 ROY W. JASTRAM, Ph.D., Associate Professor of Business Administration.  
 JOHN M. LETICHE, M.A., Lecturer in Economics.  
 GEORGE L. MEHREN, Ph.D., Assistant Professor of Agricultural Economics.  
 FREDERICK T. MOORE, M.A., Lecturer in Economics.  
 PETER N. VUKASIN, A.B., Lecturer in Economics.

*Upper Division Prerequisites.*—For students with a major in economics, courses 1A-1B and 40 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 40 is listed as a specific prerequisite.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

† Sabbatical leave in residence, 1948-1949.



*Letters and Science List.*—All undergraduate courses in economics are included in the Letters and Science List. For regulations governing this list, see page 83.

*Departmental Major Advisers:* Mr. GULICK, Chairman; Mr. BAIN, Mr. BREAK, Miss HUNTINGTON, Mr. MOORE, Mr. MOWBRAY, Mr. VUKASIN.

*Preparation for the Major.*—Required: courses 1A-1B and 40, and a minimum average grade of C in these courses. Recommended: course 10, Business Administration 6A-6B, 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 40 in the freshman year, and Business Administration 6A-6B 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.

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, 150B.
- III. Monetary and Fiscal Policy: courses 103, 130A, 130B, 137.
- IV. Labor Economics: courses 150A\*, 150B\*; Business Administration 153, 154, 155.
- V. Economic Systems: courses 101B, 106, 110, 117A\*, 117B\*.
- VI. Industrial Organization and Public Policy: courses 116A\*, 116B\*, 117B, 122; Business Administration 134.
- VII. Statistics: courses to be selected in consultation with the departmental adviser.
- VIII. International Economic Relations: courses 114, 190A\*, 190B\*, 197; Business Administration 136.
- IX. Social Economics: courses 150A, 180\*, 185, 188A, 188B.
- X. Transportation and Public Service Regulation: courses 122, 170A\*, 170B, Business Administration 173, 175.

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 as part of their programs.

The program of each student majoring in economics must be approved by one of the departmental 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. VUKASIN, Mr. KIDNER  
Prerequisite: 1A is prerequisite to 1B. Open to freshmen and others.  
Two lectures; one weekly recitation section to be arranged.  
1A. I: Two sections to be given. II: One section to be given.  
1B. I: One section to be given. II: Two sections to be given.
10. Economic History. (3) I and II. Mr. BREAK
40. Elementary Statistics. (3) I and II. Mr. JASTRAM  
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.  
NOTE.—Credit in this course is limited to 2 units for students who have received credit for Education 114 or Psychology 5.  
The mathematical treatment is reduced to the simplest possible terms, but it is urgently recommended that students who intend to take this course obtain at least the equivalent of two years of high school algebra.

## UPPER DIVISION COURSES

Primarily for undergraduates. Prerequisite for major students in economics: courses 1A-1B, 40, and junior standing; for others, 1A-1B and junior standing except where course 40 is prerequisite for a specific course.

- 100A-100B. Economic Theory. (3-3) Yr. Beginning each semester.  
Mr. BAIN, Mr. CARBERT, Mr. ELLIS, Mr. GORDON, Miss HUNTINGTON,  
Mr. LANDAUER, Mr. LETICHE, Mr. MOORE, Mr. ROLPH  
100A is not open to students taking Business Administration 107. It is recommended that this course be taken in the junior year. 100A is prerequisite to 100B.  
100A. Four sections to be given each semester.  
100B. I: Three sections to be given. II: Three sections to be given.
- 101A-101B. History of Economic Doctrine. (3-3) Yr.  
I: Mr. Vukasin; II: Mr. Brady. Mr. BRADY, Mr. VUKASIN
102. Advanced Economic Theory. (3) I and II. Mr. ROLPH  
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.  
Prerequisite: course 100A-100B.
103. Dynamic Economics and Business Fluctuations. (3) I and II.  
I: Mr. Letiche; II: Mr. Kidner. Mr. LETICHE, Mr. KIDNER  
Prerequisite: courses 40, 135, and 100A or Business Administration 107.  
It is recommended that this course be taken in the senior year.
104. Economic Policy. (3) I and II. Mr. BRADY, Mr. CARBERT  
I: Mr. Carbert; 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) I. Miss HUNTINGTON  
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  
I: Mr. Knight; II: 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. KNIGHT
113. Economic History of the United States. (3) I and II. Mr. MOSK
114. Economic Problems of Latin America. (3) I. Mr. MOSK
115. Economic Problems of the Far East. (3) II. 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. GREYER  
Primarily for seniors.  
Prerequisite: course 100A, Business Administration 107, 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.  
130A. Mr. Break; 130B. Mr. Carbert. Mr. BREAK, Mr. CARBERT
135. Money and Credit. (3) I and II. Mr. CROSS, Mr. ROLPH  
Primarily for juniors.  
I: Mr. Cross, Mr. Rolph; II: Mr. Cross, Mr. Rolph.
137. Money, Banking, and Monetary Policy. (3) I and II. Mr. ELLIS  
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.

\* Not to be given, 1948-1949.

142. Advanced Statistics. (3) I and II. Mr. CRUM  
Prerequisite: course 40, consent of the instructor, and adequate mathematical preparation.

143. Economics of Insurance. (3) I and II. Mr. MOWBRAY  
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.

150A-150B. Labor Economics. (3-3) Yr. Beginning each semester. Mr. GULICK, Mr. TAYLOR  
150A. I: Mr. Gulick; II: Mr. Taylor. 150B. II: Mr. Gulick.  
150A. The social background of labor legislation and trade unionism.  
150B. History of the labor movement. Course 150A is recommended but not required as a prerequisite for 150B.  
NOTE.—Students will not receive credit for both course 150A and Business Administration 151.

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. 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.

\* Not to be given, 1948-1949.

197. Problems in International Economic Relations. (3) I and II.  
Prerequisite: course 190A-190B. Mr. LETICHE  
Research in problems of international economic policy for advanced  
undergraduate students.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
The STAFF (Mr. MOSK, Mr. GULICK in charge)  
I: Mr. Mosk; II: Mr. Gulick.  
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 156.

- 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  
In 1948-1949, course 201A will be offered in the spring semester, 201B  
will not be offered.
202. Seminar in Advanced Economic Analysis. (3) I and II.  
Mr. ELLIS, Mr. FELLNER  
I: Mr. Fellner: National income and the theory of employment.  
II: Mr. Ellis: International finance: the theory of capital movements  
developed in the classical, neo-classical, and more recent literature; his-  
torical directions of international investment, its present status, and the  
International Fund and Bank; international investment and economic  
progress.
- 203A-203B. Dynamic Economics and Business Fluctuations. (3-3) Yr.  
203A: Mr. Kidner; 203B: Mr. Gordon. Mr. KIDNER, 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
- 213A-\*213B. American Economic History. (3-3) Yr. Mr. MOSK  
In 1948-1949 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 cor-  
poration. Implications for public policy.
- \*217. Seminar in Economic Planning. (3) I. Mr. BRADY

\* Not to be given, 1948-1949.

230. Public Finance. (3) I. Mr. ROLPH
- 235A-235B. Advanced Money and Credit. (3-3) Yr. Mr. ELLIS
241. Statistical Methods in Social Investigation. (3) II. Miss HUNTINGTON
- 250A-250B. Seminar in Labor Economics. (3-3) Yr. Beginning each semester.  
Mr. GULICK, Mr. TAYLOR  
250A. I: Mr. Gulick; II: Mr. Taylor. 250B. II: Mr. Gulick.
- 252A-252B. Advanced Labor Economics. (3-3) Yr. Mr. GULICK  
Prerequisite: course 150A (course 252A is not prerequisite to 252B). An intensive study of problems concerning labor organizations and legislation.
- 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. ROLPH, Mr. GORDON  
I: Mr. Rolph; II: Mr. Gordon.  
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.
- LUTHER C. GILBERT, Ph.D., Professor of Education (Acting Chairman of the Department).
- FRANK W. HART, Ph.D., LL.D., Professor of Education.
- MERTON E. HILL, Ed.D., Professor of Education.
- GEORGE C. KYTE, Ed.D., Professor of Education.
- THEODORE L. RELLER, Ph.D., Visiting 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.
- GEORGE A. RICE, Ed.D., Professor of Education, Emeritus.
- L. A. WILLIAMS, Pd.D., Professor of Education, Emeritus.
- HAROLD D. CARTER, Ph.D., Associate Professor of Education.
- 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.
- 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.
- <sup>2</sup> 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.
- 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.
- ENOCH DUMAS, Ed.D., Lecturer in Education, Acting Associate Director of Supervised Teaching, and Supervisor of Elementary Education.
- MALCOLM H. FINLEY, B.S., M.A., M.D., Lecturer in Special Education.
- LAURENCE F. FOSTER, Ph.D., Lecturer in Education and Supervisor of Audio-Visual Teaching.
- <sup>2</sup> MABEL F. GIFFORD, Lecturer in Special Education.
- EDITH LINDSAY, Ed.D., Lecturer in Education.
- GAIL E. MOORE, M.Ed., Lecturer in Education.

\* Absent on leave, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

DOROTHY B. NYSWANDER, Ph.D., Lecturer in Education.

ILMA BADGLEY OATMAN, M.S., Lecturer in Education and Supervisor of the Teaching of Home Economics.

\* MILDRED SHRINER, B.S., Lecturer in Special Education.

HERMAN A. SPINDT, Ph.D., Lecturer in Education.

ESTA ROSS STUART, M.A., Lecturer in Education and Supervisor of the Teaching of Commercial Subjects.

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 High School.

GEORGE J. BURKHARD, M.A., Principal of the University 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.

JAMES W. HOGE, M.A., Supervisor of the Teaching of Mathematics.

KATHARYN HOLE, Supervisor of the Teaching of Drawing.

BEULAH L. HOSTETTER, Supervisor of Music Education in the Elementary School.

WILLIAM W. KIDDER, A.B., Assistant Supervisor of Audio-Visual Education.

LOIS A. LEAR, Supervisor of Physical Education in the Elementary School.

HENRY MECKEL, Ph.D., Supervisor of the Teaching of English.

ANNE F. MERRILL, M.A., Elementary Supervisor.

VERA D. MILLER, M.A., Supervisor of the Teaching of Modern Languages.

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 83.

*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).

\* In residence spring semester only, 1948-1949.



*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) II.

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) II. 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) I and 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. LILGE  
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. H. D. CARTER, Mr. GILBERT, 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.
113. Individual Tests in Guidance. (2) I. Mr. TYLER  
Prerequisite: 6 units in psychology or educational psychology.
114. Statistical Methods in Education. (2) II. Mr. TYLER  
Prerequisite: course 110. Mathematics D is also recommended.
- \*115. Objective Tests and Measurements. (2) I. Mr. H. D. CARTER  
Prerequisite: course 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) 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.

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\* Not to be given, 1948-1949.

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.
125. Audio-Visual Education. (2) I and II. Mr. FOSTER  
Prerequisite: course 130 or 170.
130. Elementary Education. (3) I and II. Mr. BARNETT  
Prerequisite: course 110 (completed or taken concurrently).
131. Special Problems of Teaching in Elementary Schools. (2) I and II.  
Prerequisite: course 110 and 130. Mr. KYTE  
Newer trends and teaching problems in oral and written language, spelling, handwriting, creative expression, arithmetic, health and physical education.
132. Art and Music in the Elementary School. (2) I and II.  
Mr. MICHAELIS and Supervisory Staff  
Prerequisite: course 110 and 130.
134. Reading and Literature in the Elementary School. (2) I and II.  
Prerequisite: course 110 and 130. Mr. DUMAS
138. Social Studies in the Elementary School. (2) I and II. Mr. MICHAELIS  
Prerequisite: course 110 and 130.
140. The Teacher and Administration. (2) II. Mr. RELLER
141. The Administration of City School Systems. (2) I. Mr. RELLER
142. The Administration of State School Systems. (2) I. Mr. RELLER
145. Problems in Public School Finance and Business Administration. (2) II.  
Mr. RELLER  
Prerequisite: courses 140, 141, and 142, and teaching experience.
148. Public Education in California. (2) I. Mr. PETERSON  
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 269.
151. Administration of the School Health Program. (2) II.  
Miss LINDSAY, Mrs. NYSWANDER  
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. Mr. FINLEY  
Prerequisite: course 110.  
A basic course concerned with problems of childhood.

- \*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 Information. (2) I. Mr. BRAYFIELD  
Community occupational surveys; interpretations; employment trends; sources of information; use of data.
162. Aptitude Test Construction, Administration, and Evaluation of Results. (2) II. Mr. BRAYFIELD  
Prerequisite: a previous course in test administration or its equivalent in experience.  
Advantages and present limitations in the use of tests for employee selection and for vocational counseling and guidance.
163. Social and Economic Backgrounds of Vocational Education and Counseling. (2) II. Mr. BRAYFIELD
164. Counseling and Guidance. (2) I. Mr. BRAYFIELD  
Objectives, problems, programs, types of counseling; contributions by teachers, principals, specialists; community aids; evaluating the counseling service.
165. Business Education in Secondary Schools. (3) I and II. Mrs. STUART  
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.
167. Individual Inventory. (2) I. Mr. BRAYFIELD  
Types of information needed; procedures and techniques; records, forms, case studies; interpretation of data.
170. Secondary Education. (2) I and II. Mr. LUND, Mr. SPINDT  
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) I and II. Mr. LUND  
Prerequisite: course 110 already completed or taken concurrently.
181. Adult Education. (2) I. Mr. DICKERMAN  
A general overview of the field of adult education.
199. Special Study for Advanced Undergraduates. (1-5) I and II. ———

\* Not to be given, 1948-1949.

## 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 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. Mr. H. D. CARTER
- 201A-201B. History of Education. Seminar. (2-2) Yr. Mr. MOSIER  
Admission on consultation with instructor.
- \*206A-206B. Philosophy of Education. Seminar. (2-2) Yr. Mr. LILGE
- 210A-210B. Advanced Educational Psychology. (2-2) Yr. Mr. TYLER  
Prerequisite: courses 110 and 114.
- \*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 instructor.
- 216A-216B. Educational Psychology. Seminar. (2-2) Yr.  
Mrs. BAILEY, 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 Mrs. Bailey, 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 participate in all experiments.
- 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, and teachers in elementary and secondary schools and county officers who have problems in curriculum development.

\* Not to be given, 1948-1949.

- 230A-230B. Elementary Education. Seminar. (2-2) Yr. Mr. BARNETT  
Prerequisite: 12 units in education with teaching experience and consent of the instructor.
231. Administration of Elementary Education: Practicum. (2) I.  
Admission on consultation with the instructor. Mr. KYTE
- 232A-232B. The Elementary School Curriculum. Seminar. (2-2) Yr.  
Admission on consultation with the instructor. Mr. MICHAELIS
- 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. HART, Mr. PETERSON, Mr. RELLER  
Admission on consultation with the instructor.
244. Problems in Schoolhousing. (2) I and II.  
Mr. HART, Mr. PETERSON, Mr. RELLER  
Prerequisite: course 248A-248B or extensive experience in school administration.
- 248A-248B. Educational Administration. (2-2) Yr.  
Mr. HART, Mr. PETERSON  
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. HART, Mr. PETERSON  
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.
- 260A-260B. Counseling, Guidance, and Vocational Education. Seminar.  
(2-2) Yr. Mr. BRAYFIELD  
Admission on consultation with the instructor.
264. Organization and Administration of Counseling and Guidance Programs.  
(2) II. Mr. BRAYFIELD
- 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) I and II. Mr. HILL  
Prerequisite: course 130 or 170, teaching experience, and consent of the instructor.
275. Secondary Education: Survey. (2) I and II. 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) I and II.  
Prerequisite: courses 170 and 141 or 142. Mr. HILL
279. The Junior College: A Practicum. (2) I and II. Mr. HILL
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) II. 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 (——— 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,  
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.
- 320A. Introduction to Teaching. (1) I and II.  
Mr. MICHAELIS, Mr. BARNETT, Mr. CONRAD  
Lectures, conferences, laboratory, and field work. Observations and participation in some form of public school work. A limited number of juniors and seniors will be admitted. It is strongly recommended that students reserve at least a two-hour period for field work.

Sec. 1 (Secondary), Mr. Michaelis, Mr. Conrad; Sec. 2 (Elementary), 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. MICHAELIS, Mr. FOSTER, Mr. POLSON, Mrs. STUART

Lectures, conferences, demonstrations, laboratory, and school experiences.

320C. Supervised Teaching. (3) I and II.

Mr. MICHAELIS, Mrs. BAILEY, Mr. CONRAD, Mr. DUMAS,  
and SUPERVISORY STAFF

Prerequisites depend upon the type of credential desired: For Junior 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 1.5 or higher in the work of the junior and senior years, and a bachelor's degree.

Application for supervised teaching 320C must be made at Room 107, Haviland Hall during the semester preceding the student's enrollment in the course.

Candidates who are graduates of institutions other than the University of California must submit two transcripts of records 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. MECKEL
Sec. 5. Foreign Languages.	Miss MILLER
*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. 11. Homemaking.	Mrs. OATMAN
Recommended prerequisite: course 166.	
Sec. 12. Public School Music.	Mr. F. CARTER
Sec. 13. Business Education.	Mrs. STUART
Course 165 is prerequisite to supervised teaching in Business Education.	
*Sec. 14. German.	_____

\* Not to be given, 1948-1949.



- 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).  
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 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  
I and II. 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 records 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. 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. Supervised Practice in Study of Personnel Services Related to School Children. (2) II. Mrs. BAILEY  
Methods of social investigation related to the child in home, school, and community life. Field work in schools and in other social agencies.

### Special Education

- \*149. Administration, Organization, and Procedures in Special Education.  
(2) I.

\* Not to be given, 1948-1949.

- \*326. Supervised Teaching in Special Education. (4) II.  
 \_\_\_\_\_ and 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. Mrs. SHRINER
381. Adult Education Methods. (2) I and II. Mr. DICKERMAN  
 Prerequisite: course 181 or experience in adult education.  
 Psychology of adult learning; problems faced by leaders of adult groups; survey of methods and materials.

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.
- 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.

\* Not to be given, 1948-1949.

**ENGINEERING**

EVERETT D. HOWE, M.S., Professor of Engineering (Acting Chairman of the Department).

MORROUGH P. O'BRIEN, B.S., Professor of Engineering.

HERBERT V. WILEY, B.S., Lecturer in Engineering.

**CIVIL ENGINEERING**

HARMER E. DAVIS, M.S., Professor of Civil 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. GOTTAAS, Sc.D., Professor of Sanitary Engineering.

BRUCE JAMEYSON, B.S., Professor of Civil Engineering (Chairman of the Division).

WILFRED F. LANGELIER, M.S., Professor of Sanitary 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., Professor of Sanitary Engineering, Emeritus.

JOE W. KELLY, B.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.

TUNG-YEN LIN, M.S., Assistant Professor of Civil Engineering.

NED P. CLYDE, M.S., Instructor in Civil Engineering.

JOHN H. JONES, M.S., Instructor in Civil Engineering.

GEORGE A. MALONY, M.S., Instructor in Civil Engineering.

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ROBERT L. GREEN, B.S., Lecturer in Civil Engineering.

\*ROBERT HORONJEFF, B.S., Lecturer in Civil Engineering.

FREDERICK L. HOTES, M.S., Lecturer in Civil Engineering.

GEORGE D. MEIKNER, B.S., Lecturer in Civil Engineering.

ARNOLD OLITT, B.S., Lecturer in Civil Engineering.

DAVID PIRTZ, B.S., Lecturer in Civil Engineering.

KARL S. PISTER, M.S., Lecturer in Civil Engineering.

MILOS POLIVKA, M.S., Lecturer in Civil Engineering.

BERNARD A. VALLERGA, M.S., Lecturer in Civil Engineering.

RAY L. WALKER, B.S., Lecturer in Civil Engineering.

RICHARD J. WOODWARD, JR., M.S., Lecturer in Civil Engineering.

\* In residence spring semester only, 1948-1949.

## ELECTRICAL ENGINEERING

CHARLES F. DALZIEL, E.E., Professor of Electrical Engineering.  
 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.  
 THOMAS C. MCFARLAND, M.S., Associate Professor of Electrical Engineering  
 (Chairman of the Division).  
 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.  
 JOHN R. WHINNEY, 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.  
 DAN M. FINCH, B.S., 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.  
 JOHN T. BOLLJAHN, B.S., Lecturer in Electrical Engineering.  
 DAVID R. BROWN, M.S., Lecturer in Mechanical Engineering.  
 ROBERT A. BRUNS, M.S., Lecturer in Electrical Engineering.  
 ROBERT DE LIBAN, B.S., Lecturer in Electrical Engineering.  
 ROBERT W. DOWNING, B.S., Lecturer in Electrical Engineering.  
 JAMES R. FREEMAN, B.S., Lecturer in Electrical Engineering.  
 JOSEPH T. GIER, M.S., Lecturer in Electrical Engineering.  
 KARL HINRICHS, M.S., Lecturer in Electrical Engineering.  
 LOUIS A. KURTZ, B.S., Lecturer in Electrical Engineering.  
 WEI-GUAN LIN, M.S., Lecturer in Electrical Engineering.  
 RUSSELL L. LINTON, JR., B.S., Lecturer in Electrical Engineering.  
 DARREL J. MONSON, B.S., Lecturer in Electrical Engineering.  
 WILLIAM E. NORRIS, B.S., Lecturer in Electrical Engineering.  
 JOHN H. FRIEDIGKEIT, B.S., Lecturer in Electrical Engineering.  
 WILSON S. PRITCHETT, M.S., Lecturer in Electrical Engineering.  
 ROBERT M. SAUNDERS, M.S., Lecturer in Electrical Engineering.  
 OTTO J. M. SMITH, Ph.D., Lecturer in Electrical Engineering.  
 WILLIAM E. STONEY, M.S., Lecturer in Electrical Engineering.  
 GEORGE K. TAJINA, M.S., Lecturer in Electrical Engineering.  
 GEORGE F. TEALE, B.S., Lecturer in Electrical Engineering.  
 GENE W. ZEOLI, B.S., Lecturer in Electrical Engineering.

## ENGINEERING DESIGN

<sup>2</sup>ALEXANDER S. LEVENS, M.S., C.E., Professor of Engineering Design.  
 CLYNE F. GARLAND, M.S., Associate Professor of Engineering Design (Chairman of the Division).

<sup>2</sup> In residence spring semester only, 1948-1949.

WALTER W. SOROKA, Sc.D., Associate Professor of Engineering Design.  
 FRED HIRSCH, M.S., Assistant Professor of Engineering Design.  
<sup>1</sup>JAMES L. MERIAM, Ph.D., Assistant Professor of Engineering Design.  
 CARL W. NELSON, Ph.D., Assistant Professor of Engineering Design.  
 CLINTON J. ANCKER, B.S., Instructor in Engineering Design.  
 JOHN A. CLAWSON, B.S., Instructor in Engineering Design.  
 WERNER GOLDSMITH, M.S., Instructor in Engineering Design.  
 NORMAN S. WANER, M.S., Instructor in Engineering Design.

CYRIL P. ATKINSON, B.S., Lecturer in Engineering Design.  
 SHERWOOD J. BRADY, M.S., Lecturer in Engineering Design.  
 GARLAND W. BROWN, M.S., Lecturer in Engineering Design.  
 DON M. CUNNINGHAM, 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.  
 FRANK M. HAMAKER, B.S., Lecturer in Engineering Design.  
 HENRY E. HARRIS, M.S., Lecturer in Engineering Design.  
 WILLIAM W. HOWE, A.B., Lecturer in Engineering Design.  
 WILLIAM S. ROUVEROL, M.S., Lecturer in Engineering Design.  
 JAY SCHEINMAN, B.Eng., Lecturer in Engineering Design.  
 WINFIELD SISSON, B.S., Lecturer in Engineering Design.  
 FRANKLIN H. THOMPSON, 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.

#### MECHANICAL ENGINEERING

RICHARD G. FOLSOM, Ph.D., Professor of Mechanical Engineering.  
 FRANCIS W. HUTCHINSON, M.S., M.E., Professor of Mechanical Engineering.  
 BENEDICT F. RABER, B.S., Professor of Mechanical Engineering.  
 LEONID MICHAEL TIOHVINSKY, D.E.M., Professor of Mechanical Engineering.  
 CARL J. VOET, M.S., Professor of Mechanical Engineering (Chairman of the Division).  
 BALDWIN M. WOODS, Ph.D., Professor of Mechanical Engineering.  
 JOSEPH N. LECONTE, M.M.E., 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., Acting Associate Professor of Mechanical Engineering.

<sup>1</sup> In residence fall semester only, 1948-1949.

HANS ALBERT EINSTEIN, D.S.T., Acting Associate Professor of Mechanical Engineering.

E. PAUL DEGARMO, M.S., 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.

EDMUND V. LAITONE, M.A., Associate Professor of Mechanical Engineering.

W. ROSS LAURENSEN, B.S., Associate Professor of Mechanical Engineering.

RAYMOND C. MARTINELLI, Ph.D., Associate Professor of Mechanical Engineering.

JOHN A. PUTNAM, 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.

RAYMOND C. GRASSI, M.S., 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.

\*PRENTISS C. NELSON, M.S., Assistant Professor of Mechanical Engineering.

SAMUEL A. SCHAAF, Ph.D., Assistant Professor of Mechanical Engineering.

NATHAN W. SNYDER, Ph.D., Assistant Professor of Mechanical Engineering.

\*ERICH G. THOMSEN, Ph.D., Assistant Professor of Mechanical Engineering.

ROBERT M. DRAKE, JR., M.S., Instructor in Mechanical Engineering.

ROSTISLAV A. GALUZEVSKI, M.S., Instructor in Mechanical Engineering.

WARREN H. GIEDT, M.S., Instructor in Mechanical Engineering.

RUSSELL F. RHYNE, M.S., Instructor in Mechanical Engineering.

FRED M. SAUER, M.S., Instructor in Mechanical Engineering.

MARTIN B. BILES, M.S., Lecturer in Mechanical Engineering.

ROBERT V. DUNKLE, B.S., Lecturer in Mechanical Engineering.

LEO K. EDWARDE, B.S., Lecturer in Mechanical Engineering.

LEONARD FARBAR, M.S., Lecturer in Mechanical Engineering.

LAWRENCE M. GROSSMAN, M.S., Ph.D., Lecturer in Mechanical Engineering.

CARROLL I. HENWOOD, B.S., Lecturer in Mechanical Engineering.

YAO H. KENG, M.S., Lecturer in Mechanical Engineering.

DANIEL O. KLUTE, B.S., Lecturer in Mechanical Engineering.

ALAN D. K. LAIRD, M.S., Lecturer in Mechanical Engineering.

ARTHUR S. LEONARD, M.S., Lecturer in Mechanical Engineering.

DONALD GORDON MALCOLM, M.S., Lecturer in Mechanical Engineering.

WILLIAM E. NERO, B.S., Lecturer in Mechanical Engineering.

ULYSSES A. PATCHETT, M.S., Lecturer in Mechanical Engineering.

ROLAND W. PINGER, M.E., 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., B.S., Lecturer in Mechanical Engineering.

CHIN-TSE YANG, M.S., Lecturer in Mechanical Engineering.

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

## MINERAL TECHNOLOGY

- <sup>2</sup>ANDERS J. CARLSON, C.E., Ph.D., Professor of Petroleum Engineering.  
 JOHN E. DORN, Ph.D., Professor of Metallurgy.  
 LIONEL H. DUSCHAK, Ph.D., Professor of Metallurgy.  
 \*RALPH R. HULTGREN, Ph.D., Professor of Metallurgy.  
 LESTER C. UREN, B.S., Professor of Petroleum Engineering (Chairman of the Division).  
 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 Ceramics.  
 DAVID W. MITCHELL, Ph.D., Assistant Professor of Metallurgy.  
 RICHARD D. POTTER, Ph.D., Assistant Professor of Metallurgy.  
 BERNARD YORK, E.M., Assistant Professor of Mining.
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- DURAND A. HALL, M.A., Lecturer in Mining.  
 WILBUR H. SOMERTON, M.S., Lecturer in Petroleum 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. Mr. FOOTB and The STAFF  
 I, II. Five recitation sections; six field sections.  
 1B, I. Four sections.  
 1A, II. Six sections.  
 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 courses 1A, 1B.
8. Materials of Engineering Construction. (2) I and II.  
 Mr. KELLY, Mr. WALKER, Mr. WISKOCIL, Mr. TROXELL  
 Prerequisite: sophomore standing in civil engineering.  
 Structural properties and adaptability of various materials.
- 18A-18B. Strength of Materials. (3-3) Yr.  
 Mr. KELLY, Mr. WOODWARD, Mr. JAMEYSON  
 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.

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

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.  
Mr. THOMPSON (fall semester), Mr. LEVENS (spring semester)  
 Lectures and drafting.  
 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.  
Mr. HARRIS (fall semester); Mr. LEVENS (spring semester)  
 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.  
Mr. SCHEINMAN (fall semester), Mr. LEVENS (spring semester)  
 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. 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. (Replaces Engineering 10A).  
Mr. PARKER, Mr. DORN, Mr. POTTER  
 Two lectures and one lecture demonstration period per week.  
 Prerequisite: Chemistry 1A, Physics 1A-1B or 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. PARKER, Mr. DORN  
Prerequisite: same as for course 40.  
The lecture part of course 40 (formerly 10A).
- \*40L. Elementary Metallurgy Laboratory. (1) I and II. Mr. DORN, Mr. PARKER  
Prerequisite: course 40K, which may not be taken concurrently.  
The laboratory part of course 40 (formerly 10A).
41. Manufacturing Processes. (4) II. 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. Mr. DEGARMO in charge  
Two lectures, one demonstration period, and one three-hour laboratory period each week.  
Prerequisite: Engineering 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.
43. The Engineering Student and His Profession. (1) I and II. Mr. WOODS, Mr. ROUVEROL  
Prerequisite: freshman standing in an engineering program of study.  
History and development of the fields of engineering, the great engineers and their achievements, the engineering profession and modern trends.

Courses characteristic of the various curricula offered by the College of Engineering are listed under the several divisions of the department. These lists follow.

## 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. (2) I. \_\_\_\_\_  
Prerequisite: Engineering 1A-1B.  
The application of photographic and photogrammetric methods to research and field engineering.

\* Not to be given, 1948-1949.

- 102A. Route Surveying. (3) I. Mr. FOOTE, Mr. CLYDE, Mr. PISTER  
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. Mr. JAMEYSON, Mr. JONES  
Prerequisite: Engineering 8 and junior standing in engineering.  
Location, design, economics, drainage, construction, and maintenance of highways, streets, and pavements; drainage and pavements of airports.
- 107A. Framed Structures. (3) I and II.  
Mr. R. E. DAVIS, Mr. H. E. DAVIS, Mr. BRESLER,  
Mr. GREEN, Mr. PIRTZ  
Prerequisite: course 108A.  
Computation of stresses in roofs, building frames, and simple bridge trusses, by algebraic and graphical methods.
- 107C-107D. Framed Structures. (3-3) Yr. Beginning each semester.  
Mr. EBERHART, Mr. JAMEYSON, Mr. OLITT,  
Mr. VALLERGA, Mr. WOODWARD  
Lectures, computation, and drafting. Continuation of courses 107A and 133.  
Prerequisite: courses 107A and 108A-108B. For students in civil engineering.  
Analysis and design of framed structures, including an introduction into statically indeterminate frames. Design of plate girders, roof and bridge trusses, with special emphasis on highway bridges.
- 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. Mr. EBERHART, Mr. BRESLER  
 For students in civil, electrical, and mechanical engineering who have completed course 108A.  
 Solution of typical stress analysis problems; load requirements; thin web beams; monoque construction; plate stringer combinations; beam columns; space frames.
- 108A-108B. Strength of Materials. (3-2) Yr. Beginning each semester.  
 Mr. R. E. DAVIS, Mr. H. E. DAVIS, Mr. EBERHART, Mr. KELLY,  
 Mr. OLITT, Mr. TROXELL, Mr. WISKOCIL, Mr. LIN, Mr. POPOV,  
 Mr. CLYDE, Mr. BRESLER, Mr. GREEN, Mr. JONES, Mr. PISTER,  
 Mr. WALKER, Mr. HOTES  
 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.  
 Mr. R. E. DAVIS, Mr. CLYDE, Mr. KELLY, Mr. BRESLER,  
 Mr. TROXELL, Mr. HOTES  
 Prerequisite: Engineering 8 and course 108A, and 135 (which 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.  
 Mr. POPOV, Mr. PIRTZ, Mr. PISTER, Mr. WALKER  
 One three-hour laboratory period and one drafting period for the preparation of reports.  
 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.  
 Mr. R. E. DAVIS, Mr. H. E. DAVIS, Mr. EBERHART, Mr. KELLY,  
 Mr. TROXELL, Mr. WISKOCIL, Mr. OLITT, Mr. LIN, Mr. JONES,  
 Mr. PISTER, Mr. POLIVKA, Mr. VALLERGA, Mr. BRESLER, Mr.  
 GREEN, Mr. HOTES, Mr. PIRTZ  
 I. For students in electrical engineering, mineral technology, and architecture.  
 II. For students in mechanical engineering, mineral technology, and architecture.  
 Prerequisite (may be taken concurrently): for electrical and mechanical engineering and mineral technology, course 108A; for architecture, Engineering 18B.  
 Principles and methods of testing engineering materials. Physical tests of concrete, steel, iron, and wood.
- 108g. Soils and Asphalt Laboratory. (2) I and II.  
 Mr. H. E. DAVIS, Mr. OLITT, Mr. VALLERGA, Mr. WOODWARD  
 Prerequisite: senior standing in the College of Engineering.  
 Physical and mechanical tests of soils and bituminous materials.

- 108H. Soil Mechanics Laboratory. (1) I. Mr. H. E. DAVIS in charge  
Prerequisite: course 113 to be taken concurrently.  
The physical and mechanical properties of soils for engineering uses.
- 109A. Sewerage Engineering. (2) I. Mr. GOTAAS, Mr. MALONY  
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.  
Prerequisite: course 111B. Mr. GOTAAS  
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: Mathematics 4A-4B, Physics 4B-4C. Engineering 35 may be taken concurrently.  
Theory; application of principles; water-measuring devices; stream gauging.  
In the fall semester, 1948, Mechanical Engineering 103 may be substituted for this course.
- 111A. Water Supply Engineering. (2) I and II. Mr. GOTAAS, Mr. MALONY  
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  
Prerequisite: Engineering 18A-18B.  
For students in architecture.  
Analytical and graphical stress analysis for framed structures.
113. Soil Mechanics and Foundations. (2) I.  
Mr. H. E. DAVIS, Mr. WOODWARD, Mr. VALLERGA  
Prerequisite: courses 108A and 135.  
Physical and mechanical properties of soils, exploration and classification of soils; supporting capacity of soil foundations; piles and pile foundations; designs of footings.
114. Heavy Foundations and Masonry Structures. (3) I and II.  
Mr. HOTES, Mr. H. E. DAVIS, Mr. GREEN, Mr. JAMEYSON, Mr. OLITT  
Prerequisite: courses 108A, 113, and 135.  
Construction of heavy foundations, caissons, cofferdams, sheet piling; lateral earth pressure and analysis and design of retaining walls, theory and design of arches; culverts; tunnels, bridge piers, and dams.

116. Engineering Relations, Contracts, and Economics. (2) II. Mr. WISKOCIL  
Prerequisite: senior standing in engineering.  
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  
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. Sanitation of Buildings. (2) I. Mr. LANGELIER  
Prerequisite: Chemistry 1A-1B; open also to students in home economics and general science.  
Water supply, drainage, heating, ventilating, and lighting of buildings.
- †126. Applied Sanitary Science and Municipal and State Sanitation. (2) II. Mr. GOTAAAS  
Prerequisite: courses 123 and 111B.
133. Elementary Structural Design. (3) 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) II. Mr. TROXELL  
Prerequisite: course 108A.  
Elementary analysis and design of reinforced concrete beams, slabs, columns, and footings.
151. Hydrology. (2) I. Mr. GOTAAAS, Mr. MALONY  
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.

† To be given if a sufficient number of students enroll.

161. Hydraulic Laboratory. (2) I and II. Mr. EINSTEIN (fall semester),  
Mr. J. W. JOHNSON (spring semester)  
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.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.  
Mr. JAMEYSON 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. 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 156.

208. Advanced Soil Mechanics. (3) II. Mr. H. E. DAVIS  
Prerequisite: courses 108G, 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 107C and 107D.  
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 107C and 107D.  
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. Beginning each semester.  
Mr. GOTAAAS  
Prerequisite: courses 109A, 109B, 110, 111A, 111B. Program to be arranged in each case.  
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.

† To be given if a sufficient number of students enroll.

225. Advanced Sanitary Engineering Laboratory. (3) II. Mr. LANGE LIER  
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. (2-2) Yr. Mr. POPOV  
Prerequisite: graduate standing. Course 230B may precede 230A, but normally students should plan to complete course 230A first.  
Failure theories; inelastic bending; limit design; thick walled cylinders; torsion of noncircular elements; design for fluctuating and sustained loads; applications 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, 114, and 107C-107D.  
Lecture and design course. Selection of location and type; stability analysis, stress analysis of gravity, arch, multiple-arch, dome, and slab-buttress dams; problems imposed by construction conditions and use of mass concrete.
241. Industrial and Agricultural Waste Treatment. (2) II.  
Prerequisite: courses 109B and 123. Mr. GOTAA S, Mr. MALONY  
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 for the disposal and treatment of important wastes and municipal refuse.
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.
270. Airport Engineering. (3) II. Mr. HORONJEFF  
Prerequisite: courses 108A-108B, 113, 110, or Mechanical Engineering 103.  
The selection of the site, and the planning, design, and construction of airports.
275. River-Harbor Hydraulics. (3) I. Mr. EINSTEIN  
Prerequisite: graduate standing and course 110.  
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. Mr. H. E. DAVIS 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. Mr. H. E. DAVIS 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.  
(A) Voltage generation; circuit constants; single-phase and polyphase circuit analysis; single-phase transformers; polyphase connections of transformers.  
(B) 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. TEALE  
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: Electrical Engineering 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 Electrical Engineering 101.
- 103A-103B. Engineering Design of Particle Accelerators. (2-2) Yr.  
Mr. MARSHALL  
Prerequisite: junior or senior standing in College of Engineering.  
Design factors, and applications of modern nuclear machines such as cascade transformers, impulse generators, Van De Graaf generators, betatrons, cyclotrons (synchro-cyclotron), and linear accelerators.
- 104A-104B. Electrical Laboratory. (1-1) Yr. Mr. TEALE and the STAFF  
Three hours weekly.  
Prerequisite: course 100A-100B or 110A-110B which may be taken concurrently.  
Introductory experiments illustrating principles of design and opera-



tion 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.

Mr. PRITCHETT and the STAFF

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.

Mr. MORTON and the STAFF

Three lectures and one three-hour laboratory period per week.

Prerequisite: course 100A, or 101, or 110A; 105 is recommended; Mathematics 110.

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.

Mr. MCFARLAND and the STAFF

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.

Mr. MCFARLAND and the STAFF

Prerequisite: courses 104A-104B, 106, 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.

113. The Engineer and His Professional Duties. (2) I and II.

Mr. MCFARLAND and the STAFF

Restricted to seniors in the curriculum in electrical engineering.

Oral and written reports on various subjects. One subject must be a technical topic; one must relate to the professional aspects of engineering.

116A-116B. Engineering Electronics and Radio Engineering. (3-3) Yr.

Mr. REUKEMA, Mr. SCOTT, Mr. ABBOTT, Mr. PRITCHETT

Prerequisite: course 106 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  
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, which 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.  
Prerequisite: course 110A-110B, Mathematics 110. Mr. GRAYBEAL  
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. Mr. BRUNS, Mr. SMITH, and the STAFF  
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. Mr. GRAYBEAL and the STAFF  
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.  
Mr. BLACK, Mr. SCOTT, and the STAFF  
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.

Mr. BLACK, Mr. SCOTT and the STAFF

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 microwave regions.

## 133. Electrical Machinery Laboratory. (2) I and II.

Mr. DALZIEL and the STAFF

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.

Mr. GRAYBEAL and the STAFF

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, Mr. GIER

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: course 140 or equivalent.

Advanced illumination, thermal radiation, luminescence, ultraviolet radiation and infrared radiation, solar heating calculations, and design problems. Surface sources, inter-reflections. Germicidal, erythematous, and fading properties of ultraviolet radiation. Special problems in infra-red 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 156.

## 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.

## 216A-216B. Microwave Antennas. (3-3) Yr.

Mr. SILVER

Prerequisite: courses 116A-116B, 117A-117B.

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.

## 218. Power System Stability. (3) II.

Mr. DALZIEL

Prerequisite: course 118A and 118B, which may be taken concurrently.

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.

## 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; symmetrical components; power-system short circuits and stability; electrical networks; electromagnetic radiation.

Already scheduled for 1948-1949 are seminars on network analysis and feedback amplifiers, theory of high-frequency tubes, and microwave antennae.

- 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.

Mr. MERIAM in charge

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.

- 106A. Machine Design. (3) I and II.

Mr. C. W. NELSON in charge

Two lectures and one three-hour laboratory per week. (Not to be given after 1948-1949.)

Prerequisite: Engineering 24, course 102B, Civil Engineering 108A-108B.

Application of principles of mechanics, physical properties of materials, and shop processes to the design of machine parts. Lectures and problems.

106. Machine Design. (4) I and II.

Mr. HIRSCH 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. (2) II.

Mr. LEVENS

Two lectures a 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.

Mr. GARLAND, Mr. C. W. NELSON

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 an engineering program of study.  
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 in charge  
Lectures and laboratory.  
Prerequisite: course 106 or 106A, senior standing in an engineering program of study, 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 156.

- 284A-284B. Advanced Dynamics of Machinery. (3-3) Yr. Mr. GARLAND  
Prerequisite: graduate standing. Course 170 is recommended.  
Theory of mechanical vibrations with applications to linear and non-linear systems having several degrees of freedom. Torsional and lateral vibrations of shafts. Energy methods and LaGrange's equations are employed.
- 285A-285B. Applied Elasticity. (3-3) Yr. Mr. MERIAM, Mr. C. W. NELSON  
Prerequisite: graduate standing.  
Mathematical theory of elasticity with applications.
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 colleges other than Agriculture and Engineering.

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. Mr. HARDING  
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 and II. Mr. ETCHEVERRY  
Prerequisite: course 102A completed or in progress.  
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 and Engineering 1A. Mr. HARDING  
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, 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 Organizations. (2) II. Mr. HARDING  
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.

107. Operation and Maintenance of Irrigation Systems. (2) I. Mr. HARDING  
Prerequisite: course 113 for agricultural students; courses 102A and 103 for engineering students.
112. Irrigation Design. (2) I and II. Mr. ETCHEVERRY, Mr. HOTES  
Prerequisite: Civil Engineering 108A-108B and 110.  
Design of structures such as flumes, drops, inverted siphons, and headgates with estimates of cost.
113. Development and Use of Farm Irrigation Water Supplies. (3) I.  
Mr. HARDING  
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 curriculum except civil engineering.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.  
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.  
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 156.

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.  
Prerequisite: graduate standing. Mr. ETCHEVERRY in charge  
Special studies and problems relating to drainage, reclamation, and flood protection; irrigation institutions and organizations; development and utilization of water supplies.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. 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. Mr. IVERSEN in charge  
Prerequisite: junior standing and completion of Engineering Design 102B.

The principles of mechanics applied to the statics and to the flow of incompressible and compressible fluids.

- 105A. Thermodynamics. (3) I and II. Mr. RABER in charge  
Prerequisite: junior standing in an engineering program of study.  
A special section is offered for students in the chemical engineering curriculum and process engineering curriculum.

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. Mr. HUTCHINSON in charge  
Prerequisite: junior standing in an engineering program of study and course 105A.

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. Mr. FARBAR in charge  
I. For industrial engineering students.  
II. For electrical and process engineering students.  
Prerequisite: course 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.

113. The Engineer and His Professional Development. (2) I and II. Mr. RABER in charge  
Prerequisite: senior standing in the mechanical or industrial engineering programs of study.

Oral and written reports on various subjects pertinent to the professional relationships, duties, and ethics of the engineer.

115. Reversed Thermodynamic Cycles and Refrigeration. (3) I. Mr. HUTCHINSON  
Prerequisite: courses 105A, 105B, and senior standing in an engineering program of study.

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 an engineering program of study.

Theory and practice of air conditioning, illustrated by study trips to actual plants.

117. Combined Refrigeration and General Air Conditioning. (3) I. Mr. RABER  
 Prerequisite: courses 105A, 105B, and senior standing in an engineering program of study.  
 Theory and practice of refrigeration and air conditioning, illustrated by trips to actual plants.
118. Industrial Power-Plant Design. (3) II. Mr. RABER  
 Prerequisite: courses 105A, 105B, and senior standing in an engineering program of study.  
 Theory and practice of industrial power-plant design and economics. Illustrated by study trips to actual plants.
120. Principles of Engineering Investment and Economy. (3) I and II. Mr. DEGARMO, Mr. PINGER  
 Prerequisite: senior standing in an engineering program of study.  
 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.
121. Engineering Aerodynamics. (3) II. Mr. LAITONE  
 Prerequisite: course 103; courses 161 or 162 are recommended.  
 Wing characteristics, performance determination, loading conditions, static and dynamic stability and control of airplanes.
- 123A-123B. Internal Combustion Engines. (3-3) Yr. Mr. VOGT, Mr. TICHVINSKY  
 Prerequisite: senior standing in the College of Engineering.  
 Application of the principles of engineering mechanics and thermodynamics to the field of internal combustion engines.  
 (A) Injection systems, performance, fuels, carburetion.  
 (B) Dynamics, lubrication, heat transfer.
- 124A-124B. Mechanical Engineering. (3-3) Yr. Mr. FOLSOM in charge  
 Prerequisite: courses 103, 105B, Electrical Engineering 100B, and senior standing in the College of 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 requirements, 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. LAURENSEN  
 Prerequisite: Engineering 35, Civil Engineering 108A (completed); Engineering Design 102B and Mechanical Engineering 103 (may be taken concurrently).  
 Investigation of important hull problems arising in merchant-type passenger and cargo vessel operation. Topics include: draft, trim, free-

\* Not to be given, 1948-1949.

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. LAURENSEN  
Prerequisite: Mechanical Engineering 105A, 105B. (Mechanical Engineering 128A is recommended.)

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.

Mr. BOODBERG in charge

Prerequisite: senior standing in an engineering program of study. It is desirable that restricted electives be completed before taking this course.

Engineering applications of the properties of substances, fluid mechanics, heat transfer, and dynamics.

143. Time and Motion Study. (3) I and II. Mr. L. E. DAVIS, Mr. MALCOLM  
Prerequisite: Engineering 41, and senior standing in an engineering program of study or in the School of Business Administration.

Laws of motion economy; study of hand motions and their simplification through the use of process charts, micromotion analysis, and work-place 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. L. E. DAVIS  
Prerequisite: course 143, and senior standing in an engineering program of study or in the School of Business Administration.

Theory and practice of plant, equipment selection and layout; factors affecting plant location and design; process charts, equipment selection and layout; materials handling; plant services.

145. Tool Engineering. (3) I and II.

Mr. GALUZEVSKI, Mr. MALCOLM, Mr. GRASSI

Two lectures and one two-hour laboratory period a week.

Prerequisite: Engineering 24, 41, and senior standing in an engineering program of study and Engineering Design 106 (may be taken concurrently).

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. MARTINELLI, Mr. H. A. JOHNSON, Mr. SEBAN

Prerequisite: course 105A, 105B, or 154. Mathematics 110A-110B (or equivalent) strongly recommended.

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. SNYDER

Prerequisite: course 105A and 105B; Chemistry 109 is recommended.

Principles of distillation, mechanical separations, filtration, crystallization, and materials handling.

- 152B. Industrial Mass Transfer. (3) II. Mr. SNYDER  
Prerequisite: courses 105A, 105B, 151; Chemistry 109 is recommended.  
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, Mr. LAITONE  
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: courses 103 and Mathematics 110A-110B.  
Stream function, potential function, and conformal transformation with applications to engineering problems.
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, multi-phase flow, materials handling, mixing and pumping equipment.
164. Instrumentation and Automatic Control. (2) I. Mr. FOLSOM  
Prerequisite: courses 103, 105B, Engineering Design 102B. Mathematics 110A-110B is desirable.  
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 (Engineering Design 170 recommended).  
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. Mr. VOGT in charge  
Prerequisite: senior standing in engineering and a B average.  
Group study of selected topics. Study groups may be organized in appropriate fields such as advanced descriptive geometry, 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. Mr. VOGT in charge  
Prerequisite: senior standing in engineering and 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 156.

NOTE.—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.

243. Advanced Time and Motion Study. (3) I. Mr. L. E. DAVIS  
Prerequisite: courses 143, 144, Economics 40, and Psychology 185 (may be taken concurrently).  
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.
- 267A-267B. Heat Transfer. (3-3) Yr. Mr. MARTINELLI, Mr. SEBAN  
Prerequisite: course 151 (may be taken concurrently); course 161 and Mathematics 119A-119B are desirable.  
Study of steady-state, transient, and periodic problems of heat conduction. Mathematical solution of convection problems, including boundary layer theory and heat transfer during laminar and turbulent flow. Transfer of radiant energy. Geometrical and spectral characteristics of radiant systems.
268. Advanced Problems in Thermodynamics. (3) II. Mr. GROSSMAN  
Prerequisite: graduate standing and course 154.  
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) I. Mr. FOLSOM  
Prerequisite: graduate standing; 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: graduate standing, course 162 or Mathematics 270.  
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. PUTNAM, Mr. LAITONE  
Prerequisite: graduate standing. Courses 161 and 162 are recommended.  
Theory of viscous and turbulent flow with applications to fundamental flow problems.

277. Compressible Fluids. (3) I. Mr. SCHAAF  
Prerequisite: graduate standing. Course 162 or Mathematics 270 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. Mr. VOGT 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, and automatic control. Students may enroll in one or more separate subjects.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. Mr. VOGT in charge  
Investigation of advanced mechanical engineering problems. Students enrolled in this course will attend the weekly research conference.

## 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 1A, 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.
103. Mineral Exploitation. (3) I. Mr. HALL  
Prerequisite: Geology 1A, 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 economic geology curricula.
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 156.

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. SOMERTON  
Prerequisite: junior standing in an engineering curriculum; 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. Oil and Gas 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. UREN  
Petroleum exploration; principles of oil field development; methods of drilling and controlling oil and gas wells.

- 121B. Petroleum Production Methods. (3) II. Mr. UREN  
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. Mr. UREN  
 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. UREN  
 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. SOMEYTON  
 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.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.  
 The STAFF (Mr. UREN 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. UREN in charge)  
 Prerequisite: senior standing in engineering.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

- 207A. Seminar in Fundamentals of Reservoir Engineering. (2) I. Mr. PUTNAM  
 Prerequisite: courses 121A-121B, 123A-123B; Mathematics 110; Chemistry 109.  
 Subsurface conditions in reservoirs and wells. Characteristics of reservoir rocks. Thermodynamics and kinetic properties of reservoir fluids. Phase relationships of hydrocarbons. Application of engineering principles to economic production.
- 207B. Seminar in Petroleum Production Technology. (2) II. Mr. UREN  
 Prerequisite: course 121A-121B. May be repeated without duplication of credit.  
 Seminar topics will be changed each year.
- \*209A. Seminar in Petroleum Engineering (2-3) I. Mr. CARLSON  
 Prerequisite: course 119 and completion of curriculum in process engineering or chemical engineering.  
 Modern petroleum refinery practice. Technology of petroleum processing. Plant operation.

\* Not to be given, 1948-1949.

- 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. I and II. The STAFF  
Credits and hours to be arranged.  
Prerequisite: graduate status.
- 299A-299B. Individual Study or Research. Yr. Beginning each semester.  
Credits and hours to be arranged. The STAFF (Mr. UREN in charge)  
Prerequisite: graduate status.

## METALLURGY

## LOWER DIVISION COURSES

- 2A. Metallurgical Analysis. (3) I. Mr. MITCHELL  
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. Mr. MITCHELL  
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. Mr. MITCHELL  
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. Mr. DUSCHAK  
Prerequisite: junior standing in engineering, chemistry, or equivalent.  
A general survey of the iron and steel industry.
108. Mineral Concentration. (3) I. Mr. DUSCHAK  
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. DUSCHAK  
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. DUSCHAK  
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. Mr. DUSCHAK  
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. DUSCHAK  
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.
122. Metallurgical Calculations. (2) II. Mr. MITCHELL  
Prerequisite: senior standing in metallurgy curriculum.  
A quantitative study of metallurgical operations, power requirements, material and heat balances; costs.
124. Nonmetallics. (2) I. Mr. DUSCHAK  
Prerequisite: senior standing or equivalent in engineering, or chemistry.  
The occurrence, treatment, and utilization of the principal nonmetallics; the raw materials, processes, and products of the glass and ceramic industries; Portland cement, lime, refractories, abrasives, fluxes, and related products.
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. DORN  
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. PARKER  
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. DORN  
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.
- 152L. Physical Metallurgy Laboratory. (1) I. Mr. DORN  
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. Mr. POTTER  
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. POTTER  
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 desirable.  
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. (2) II. Mr. PARKER  
Prerequisite: Metallurgy 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. DUSCHAK 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. DUSCHAK in charge)  
Prerequisite: senior standing in engineering.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

- †202. Metallurgy of the Less Common Metals. (2) II. Mr. DUSCHAK  
Hours to be arranged. Prerequisite: courses 112 and 114.
- †210A-210B. Metallurgical Investigation. (2-3; 2-3) Yr. Mr. DUSCHAK  
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  
Prerequisite: course 160 and graduate standing.  
Preparation of metallic single crystals, stress strain relationships for crystals having different orientations, theories of strain hardening, internal

\* Not to be given, 1948-1949.

† To be given if a sufficient number of students enroll.

friction, magnetic properties, preferred orientation in polycrystalline materials, orientation determination and pole figures, relation between properties of single crystal and polycrystalline materials. Lectures and laboratory work.

298. Group Studies, Seminars, or Group Research. I and II.

The STAFF (Mr. DUSCHAK in charge)

Credit and hours to be arranged.

Prerequisite: graduate standing.

299A-299B. Individual Study or Research. Yr. Beginning each semester.

The STAFF (Mr. DUSCHAK in charge)

Credit and hours to be arranged.

Prerequisite: graduate standing.

Research Conference in Physical Metallurgy (no credit).

The instructing staff and graduate students meet once a week to discuss research and advanced subjects.

## ENGLISH

- MYRON F. BRIGHTFIELD, Ph.D., Professor of English.  
 ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology.
- <sup>2</sup> BERTRAND H. BRONSON, Ph.D., Professor of English.  
 JAMES R. CALDWELL, Ph.D., Professor of English.
- <sup>\*</sup> JAMES M. CLINE, Ph.D., Professor of English.
- <sup>2</sup> WILLARD H. DURHAM, Ph.D., Professor of English.  
 WILLARD E. FARNHAM, Ph.D., Professor of English.  
 BENJAMIN P. KURTZ, Ph.D., Professor of English.  
 BENJAMIN H. LEHMAN, Ph.D., Professor of English (Chairman of the Department).
- GUY MONTGOMERY, Ph.D., LL.D., Professor of English.
- <sup>1</sup> GEORGE R. POTTER, Ph.D., Professor of English.
- † MARK SCHORER, Ph.D., Professor of English.
- <sup>1</sup> GEORGE R. STEWART, Ph.D., Professor of English.  
 WALTER M. HART, Ph.D., LL.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.
- <sup>\*</sup> GORDON MCKENZIE, Ph.D., Associate Professor of English.
- <sup>3</sup> JOSEPHINE MILES, Ph.D., Associate 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.  
 JAMES J. LYNCH, Ph.D., Assistant Professor of English.  
 ROY H. PEARCE, Ph.D., Assistant Professor of English.  
 BREWSTER ROGERSON, Ph.D., Assistant Professor of English.  
 WAYNE SHUMAKER, Ph.D., Assistant Professor of English.  
 LYNN B. BENNION, Ph.D., Instructor in English.  
 TRAVIS BOGARD, Ph.D., Instructor in English.  
 JOHN E. JORDAN, Ph.D., Instructor in English.  
 HAROLD D. KELLING, Ph.D., Instructor in English.  
 CHARLES S. MUSCATINE, Ph.D., Instructor in English.  
 JOHN H. RALEIGH, Ph.D., Instructor in English.
- ROSSITER R. BELLINGER, M.A., Lecturer in English.  
 FREDERIC I. CARPENTER, Ph.D., Lecturer in English.  
 EDITH D. HENRICH, A.B., Lecturer in English.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

<sup>3</sup> Absent on leave fall semester; sabbatical leave in residence, spring semester, 1948-1949.

<sup>\*</sup> Absent on leave, 1948-1949.

† Sabbatical leave in residence fall semester; absent on leave, spring semester, 1948-1949.

THOMAS F. PARKINSON, M.A., Lecturer in English.  
 DAVID W. REED, M.A., Lecturer in English.  
 ERNEST TUVESON, M.A., Lecturer in English.  
 SETH P. ULMAN, M.A., Lecturer in English.  
 SHERNA S. VINOGRAD, Ph.D., Lecturer in English.  
 IMOGENE B. WALKER, Ph.D., 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 83.

*Departmental Major Advisers:* Mr. ROGERSON, Chairman; Mr. BENNION, Mr. BOGARD, Mr. JORDON, 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 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.



*Honor Students in the Senior Year.*—See Honors course, page 312.

*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.

The attention of undergraduates contemplating graduate study is called to the requirements in foreign languages for higher degrees in English. Such students are advised to prepare, during their undergraduate years, to meet these requirements.

#### LOWER DIVISION COURSES

##### FRESHMAN COURSE

1A-1B. First-Year Reading and Composition. (3-3) Yr. Beginning each semester.

Mr. BELLINGER, Mr. BENNION, Mr. BOGARD, Mr. EVANS, Mr. GRINNELL, Mrs. HENRICH, Mr. HUTSON, Mr. JAYNE, Mr. JORDAN, Mr. KELLING, Mr. LEHMAN, Mr. MONTGOMERY, Mr. MUSCATINE, Mr. PARKINSON, Mr. PEARCE, Mr. POTTER, Mr. RALEIGH, Mr. REED, Mr. ROGERSON, Mr. SHUMAKER, Mr. TUVESON, Mr. ULMAN, Mrs. VINOGRAD, Mrs. WALKER, Miss WHISTLER, and Assistants

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) I.

Mr. STEWART

41A-41B. Writing in Connection with the Reading of Important Books of the Nineteenth and Twentieth Centuries. (3-3) Yr.

Mr. LEHMAN

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. BELLINGER, Mr. BENNION, Mr. BOGARD, Mr. CARPENTER, Mr. HART, Mrs. HENRICH, Mr. HUTSON, Mr. LYNCH, Mr. PARKINSON, Mr. PEARCE, Mr. ROGERSON, Mr. SHUMAKER, Mr. ULMAN, Mrs. WALKER

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) 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.)

- 153A-153B. Introduction to the Study of Poetry. (3-3) Yr. Mr. KURTZ  
 An introduction to the principles of criticism for those who desire a general acquaintance with poetry and for those who intend to select a European literature as a major. Course 153A is not prerequisite to 153B.
154. Master Spirits of Literature: Great Dramatists, Ancient and Modern. (3) II. Mr. DURHAM
- 114A-114B. The English Drama. (3-3) Yr. Mr. BOGARD, Mr. DURHAM  
 114A. From the miracle plays to 1642. Mr. Bogard.  
 114B. From 1642 to the present. Mr. Durham.  
 Course 114A is not prerequisite to 114B.
- 125C-125D. The Novel. (3-3) Yr. Mr. BRIGHTFIELD  
 Course 125C is not prerequisite to 125D.
116. The English Bible as Literature. (3) I. Mr. POTTER
- 117A-117B. Shakespeare. (3-3) Yr. Mr. FARNHAM, Mr. MONTGOMERY  
 117A: Mr. Montgomery. 117B: Mr. Farnham.  
 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) II. Mr. MONTGOMERY  
 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
156. The Age of Elizabeth. (3) II. Mr. JAYNE
157. The Age of Milton. (3) I. Mr. POTTER
166. The Age of Swift and Pope. (3) I. Mr. MONTGOMERY
119. The Age of Johnson. (3) II. Mr. BRONSON

\* Not to be given, 1948-1949.

121. The Romantic Period. (3) II. Mr. JORDAN
122. The Victorian Period. (3) II. Mr. BENNION
123. Nineteenth-Century Prose. (3) I. Mr. SHUMAKER
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). Mr. HART
- 130A. American Literature before 1840. (2) I. Mr. PEARCE
- 130B. American Literature: 1840-1885. (3) I. Mr. HART
- 130C. American Literature: 1885 to the Present. (3) II. Mr. PEARCE
110. The English Language. (3) I and II Mr. BRIGHTFIELD, Mr. KELLING  
I: Mr. Brightfield; II: Mr. Kelling.

## 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. CALDWELL, Mr. GRINNELL, Mr. JORDAN,  
Mr. KELLING, Mr. LYNCH, Mr. MUSCATINE, Mr. RALEIGH,  
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. Reed; II: Mr. Hutson, Mr. Muscatine.
- 151S. Shakespeare. (3) II. Mr. EVANS
- 151J. Donne and Milton. (3) I and II. Mr. FARNHAM, Mr. SHUMAKER  
I: Mr. Farnham; II: Mr. Shumaker.

\* Not to be given, 1948-1949.

- 151D. Dryden. (3) II. Mr. MONTGOMERY
- 151E. Henry James. (3) I. Mr. RALEIGH
- 151W. Whitman. (3) I. Mr. CARPENTER
- 151K. Contemporary Authors. (3) I and II. Mr. CALDWELL, Mr. PARKINSON  
I and II: T. S. Eliot. Mr. Caldwell.  
II: W. B. Yeats. Mr. Parkinson.

## C. HONORS COURSE

199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Mr. ROGERSON and the STAFF  
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) I and II. Mr. LEHMAN, Mr. STEWART  
I: Short Story and Novel. Mr. Stewart.  
II: Short Story. Mr. Lehman.
- 106B. Verse. (3) I and II. Mr. CALDWELL, Mrs. HENRICH  
I: Mrs. Henrich; II: Mr. Caldwell.
- \*106E. Nonfiction Narrative. (3) Mr. STEWART
- 106H. Expository and Critical Writing. (3) I and II.  
Mr. CARPENTER, Mr. JORDAN, Mr. KELLING, Mr. MONTGOMERY  
I: Mr. Jordan, Mr. Montgomery.  
II: Mr. Carpenter, Mr. Kelling.
- 106L. Advanced Composition. (3) I and II. Mr. EVANS  
Primarily for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is English.
- 106M. Advanced Composition. (2) I and 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,

\* Not to be given, 1948-1949.

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 156.

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, 258, 262, 263A-263B.

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. KURTZ

I: Mr. Brightfield, Mr. Kurtz; II: Mr. Kurtz.

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) II.

Mr. BRIGHTFIELD

204. Celtic Studies. (3) I and II.

Mr. HUTSON

211A. Old English Literature. (3) I.

Mr. BRODEUR, Mr. REED

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

Development of the English language from its beginning as illustrated in representative texts. Especially designed for candidates for the Ph.D. degree. Prerequisite: a reading knowledge of German.

213. Readings in Middle English. (3) I. Mr. HUTSON  
Rapid reading of selections in Middle English, and perhaps some entire poems, from the twelfth century to the fifteenth.
- \*210. Chaucer. (3) 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) \_\_\_\_\_
- 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.
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, Mr. STEWART  
I: Mr. Stewart; II: Mr. Hart.
262. Nineteenth-Century Literature. (3) II. Mr. BRIGHTFIELD
- 263A-263B. Literary Criticism in the Nineteenth Century. (3-3) Yr. Mr. KURTZ
247. Poetics: Seventeenth-Century Theory and Practice. (3) II. Miss MILES  
Special reference to a historical period, to be selected.
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 herewith suggested:
1. Critical Theory (Brightfield, Caldwell, Kurtz, McKenzie, Miles).
  2. Prose Fiction (Brightfield, Lehman, Schorer).
  3. Drama (Durham, Farnham).
  4. Linguistics (Brodeur, Hutson).
  5. Early Germanic Literature (Brodeur).
  6. Celtic (Hutson).
  7. The Ballad (Bronson).
  8. Chaucer and the Middle Ages (Brodeur, Caldwell, Cline, Grinnell).
  9. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Cline, Farnham, Potter).
  10. Eighteenth Century (Bronson, Montgomery, Schorer).
  11. Nineteenth Century (Brightfield, Caldwell, Kurtz, Lehman, McKenzie).
  12. American Literature (Hart, Stewart).

\* Not to be given, 1948-1949.

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 Virgil.

178. Greek and Roman Mythology.

180A-180B. The Latin Classics in English.

Dramatic Art 157A-157B. Modern European Drama.

French 9A-9B-9C. French Literature in English Translation.

122A-122B. Readings in French Literature of the Middle Ages.

German 9A-9B-9C-9D. 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.

Oriental Languages 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 (Acting Chairman of the Department).

PERCY M. BARR, Ph.D., Sc.D., Professor of Forestry.

JOSEPH KITTFREDGE, 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., Instructor in Forestry.

R. KEITH ARNOLD, M.F., Associate 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 83.

## LOWER DIVISION COURSES

## 1. Elements of Forestry. (3) I. \_\_\_\_\_

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.

Mr. ARNOLD

(Formerly numbered 105A-105B.)

Prerequisite: Engineering 1A-1B, Botany 1, and a grade average 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 a grade average of C or higher are prerequisite to admission to the School of Forestry.

## UPPER DIVISION COURSES

## 100. Introduction to Professional Forestry. (3) I. \_\_\_\_\_

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. BAKER  
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  
Lectures 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  
Lectures, 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. COCKRELL  
Lecture, recitation sections, 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. BARR  
Lectures and conference.  
Prerequisite: a course in elementary statistics; 3 units of college mathematics.  
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  
Lectures 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  
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 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  
Lectures 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) II. Mr. ZIVNUSKA  
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.  
Forests in their relation to society. State and national forest policies.
123. Range Utilization. (3) I. Mr. BISWELL  
Lectures and laboratory.  
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  
Lectures 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. Mr. ARNOLD  
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. Elements of Photogrammetry. (3) II. Mr. COLWELL  
Lectures and laboratory.  
Limited to thirty students.  
The construction of maps and terrain models from vertical and oblique aerial photographs. The recognition and delineation of physiographic forms and vegetation types appearing on aerial photographs.
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 156.

- 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.

PERCIVAL B. FAY, Ph.D., Professor of French.

<sup>1</sup>ARNOLD H. ROWBOTHAM, Ph.D., Professor of French (Chairman of the Department).

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.

JACQUELINE DE LA HARPE, Docteur ès Lettres (Lausanne), 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., Instructor in French.

MARIE-LOUISE DUFRENOY, Ph.D., Associate in French.

ALICE HABIS-REUTINGER, Ed.D., Associate in French.

IRVING PUTTER, 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 83.

*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 10A-10B, 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

NOTE: 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.

<sup>1</sup> In residence fall semester only, 1948-1949.

\* Absent on leave, 1948-1949.

1. Elementary French. Beginners' Course. (4) I and II.  
Sections meet five hours weekly. Mr. MEYLAN in charge
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.  
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.
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 (conversation).
8. Intermediate French, Reading. (4) I and II. Mr. BRENNER in charge  
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 8 with grade A or B.

## 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. BONNO in charge
- 109A-109B. A Survey of French Literature from the Middle Ages to the Present. (3-3) Yr. Mr. MEYLAN, 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
- 120A-120B. The Seventeenth Century. (2-2) Yr. Mr. FAY
- 121A-121B. The Eighteenth Century. (2-2) Yr. Mr. ROWBOTHAM, Mr. BRENNER
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.

\* Not to be given, 1948-1949.

- 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. BONNO  
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)  
Consultations in regard to individual investigations in philological or  
literary fields.

COURSES IN WHICH NO KNOWLEDGE OF FRENCH IS REQUIRED

9. French Literature in English Translation.  
Lectures (in English) and collateral reading of representative works  
in English Translation.
- 9A. To the End of the Eighteenth Century. (2) I.  
No prerequisite. Mr. ROWBOTHAM, Mr. EUSTIS, Mr. PUTTER
- 9B. The Nineteenth Century. (2) II. Mr. EUSTIS, Mr. PUTTER  
No prerequisite.
- 9C. The Contemporary Period. (2) I. \_\_\_\_\_  
Prerequisite: course 9B 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 156.

Course 201A or 206A is required of all candidates for the M.A. degree.

- 201A-201B. Historical Grammar. (3-3) Yr. Mr. WALPOLE
- \*202A-202B. Studies in Medieval French Literature. (2-2) Yr. Mr. WALPOLE  
Reading knowledge of Old French required.
- \*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.

\* Not to be given, 1948-1949.

- 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. BONNO in charge)

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\* Not to be given, 1948-1949.

## GEOGRAPHY

JOHN B. LEIGHTLY, Ph.D., Professor of Geography.

<sup>1</sup> CARL O. SAUER, Ph.D., Professor of Geography (Chairman of the Department).

JOHN E. KESSELL, Ph.D., Associate Professor of Geography.

JAMES J. PARSONS, Ph.D., Instructor in Geography.

<sup>2</sup> ALFRED H. DEVRIES, Lecturer in Map History.

WALTER A. HACKER, Ph.D., Lecturer in Geography for the spring semester.

GEORGE H. T. KIMBLE, Ph.D. (Professor of Geography, McGill University),  
Visiting Professor of Geography for the fall semester.

NICHOLAS T. MIROV, Ph.D., Lecturer in Geography.

ERHARD ROSTLUND, M.A., Lecturer in Geography.

*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 83.

*Departmental Major Adviser:* Mr. KESSELL.

*Preparation for the Major.*—Required: courses 1, 2, and 4. Recommended: Botany 12, Geology 1A-1B, 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 102, 118A-118B; Botany 151; Economics 110, 113, 188A; Forestry 103, 125; Genetics 100; History 161A-161B; Social Institutions 121A-121B; 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. Mr. KESSELL  
One lecture and two two-hour laboratory periods weekly.
- 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. KESSELL  
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.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.



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. LEIGHTLY  
 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.
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 European 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. LEIGHTLY  
 Prerequisite: a knowledge of elementary physics and calculus is desirable.
113. Climatology. (3) II. MR. LEIGHTLY  
 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. PARSONS
- 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 South Africa. (3) II. MR. TALBOT  
 Physical and human geography of Africa south of the equator. History of colonization and economic exploitation. The problems of destructive use of the land. Sociologic and political conflicts between white and colonial stocks of the area.
128. Geography of the North Lands. (3) I. MR. KIMBLE  
 Physiographic, climatic, biogeographic patterns of the Arctic. Living conditions and colonization prospects. Present economic and strategic roles.
131. Geography of California. (3) II. MR. KESSELI

- \*141. Economic Geography: Primary Production. (3) I. \_\_\_\_\_  
 Analysis of the distribution of agricultural and mineral raw materials in relation to world commerce.
142. Economic Geography: Industrial Localization. (3) I. 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. LEIGHTLY  
 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. TALBOT  
 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.
171. Historical Geography of English Overseas Exploration and Colonization. (3) I. Mr. KIMBLE  
 Expansion of English civilization in the early modern period, with special attention to the preferred areas of settlement, and the reasons therefor; modification and adaptation of cultural elements in new environments.
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 156.

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. KIMBLE  
 Topic: Development of earth knowledge.
203. Seminar in Cultural Geography. (2) II. Mr. TALBOT
205. Seminar in Physical Geography. (2) II. Mr. KESSELI  
 Topic: Analysis of land forms.
- \*206. Seminar in Physical Geography. (2) II. Mr. LEIGHTLY  
 Topic: Applied climatology.
207. Seminar in History of Geography. (2) II. Mr. LEIGHTLY  
 Topic: Geographic thought in the United States.
- 219A-219B. Research (2-2) Yr.  
 The STAFF (Mr. SAUER, Mr. KESSELI in charge)

\* Not to be given 1948-1949.

## GEOLOGICAL SCIENCES

PERRY BYERLY, Ph.D., Professor of Seismology.

\*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 (Chairman of the Department).

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.

GARNISS H. CURTIS, B.S., Lecturer in 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 83.

*Departmental Major Adviser:* MR. TURNER.

*Preparation for the Major.*—Required: Chemistry 1A-1B; Physics 2A-2B; Engineering 1A-1B; Geology 1A-1B; Mineralogy 4A-4B; Mathematics 3A-3B. It is recommended that prospective major students take Mathematics 4A-4B, and Physics 3A-3B. In selecting a major group the student should note the prerequisites for the individual courses included in the group. Such prerequisites should be completed in the lower division. Certain of the preparatory courses may be postponed to the upper division by permission of the department. A reading knowledge of French and German is required of candidates for the Ph.D. degree.

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 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.*—All major programs must include Geology 102A-102B (4), 103 (4) and 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.

\* Absent on leave, 1948-1949.

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 102A-102B (8) or 104 (4). Recommended: Geology 110A-110B (5), 116 (2), 122A-122B (4).

IV. Emphasis on historical and stratigraphic geology: Geology 107 (2), 116 (2), Paleontology 102A-102B (8), and two of the following courses: Paleontology 103, 104; Geology 104A, 104B, 209A, 209B.

V. Emphasis on geophysics: Geology 120 (2), 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. BYERLY.

*Preparation for the Major.*—Required: Chemistry 1A-1B; Geology 1A-1B; 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

##### 1A. General Geology: Dynamical and Structural. (3) I.

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.

##### 1B. General Geology: Historical. (3) II.

Mr. HINDS

Three lectures and one demonstration and discussion section weekly.

Prerequisite: Geology 1A or 2.

Origin and geological history of the earth and the evolution of its animal and plant inhabitants.

##### 2. Elementary Physiography. (3) II.

Mr. HINDS

Three lectures and one section meeting weekly.

Not open to students who have taken or are taking Geology 1A.

The earth's surface features and the geologic laws governing their origin and development. Principles underlying the evolution of topography under different climatic conditions.

##### UPPER DIVISION COURSES

##### 102A-102B. Field Geology. (2-2) Yr.

Mr. CURTIS, Mr. GILBERT, Mr. OGLE, Mr. TALIAFERRO,  
Mr. VERHOOGEN, Mr. WILLIAMS

One lecture a week and field trips Saturday, all day.

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. CURTIS, Mr. GILBERT, 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 1A, 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. WILLIAMS

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. CURTIS

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 1B, 102A, and 103.

108. Economic Geology, Nonmetalliferous Deposits. (2) I. Mr. VERHOOGEN

Special emphasis is placed on petroleum.

Prerequisite: Geology 1A and Mineralogy 4A.

109. Microscopy of the Metallic Ores. (3) II. Mr. CURTIS

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.

I: Mr. Gilbert; II: Mr. Turner.

Mr. GILBERT, Mr. TURNER

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

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 1A, 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. Advanced Summer Field Course. (4-6)

Mr. TALIAFERRO

Prerequisite: Geology 102A-102B.

The chief aim of the course is to develop in the student: (1) facility and accuracy in detailed geological mapping; (2) ability to observe independently and to interpret various types of rocks, structures, physiographic features, and other geological phenomena; and (3) the capacity to execute independently a geological survey of a region, determine its history, and prepare a suitable report. Satisfactory completion of this course satisfies the undergraduate thesis requirements for students whose major is geology.

With the approval of the instructor, this work may be taken for credit during two or more summers, under the designation Geology 118; however, not more than 6 units of credit so gained will be accepted as part of the undergraduate major.

120. Elementary Seismology. (2) I.

Mr. BYERLY

Prerequisite: Physics 2A-2B, Geology 1A.

Nature, causes, and effects of earthquakes; great earthquakes of the past; types of seismic waves and the evidence they offer as to the structure of the earth.

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,

\* Not to be given, 1948-1949.

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 1A, 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. WILLIAMS 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 156.

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 some of the more important problems of geodynamics, including earthquake waves.
- \*206. Seminar in Geology of Metalliferous Deposits. (2) I. Mr. HULIN  
Prerequisite: Geology 106.
- 207A. Seminar in Volcanology. (2) I. Mr. WILLIAMS  
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 1B 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.
- 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 during the spring semester.  
Prerequisite: Geology 104A-104B. Recommended: Mineralogy 105.  
Metamorphic and igneous rocks in alternate years. 1948-1949, igneous, rocks.
- 215A-215B. Seminar in Sedimentation. (2-2) Yr. Mr. TURNER  
Prerequisite: Geology 104A-104B.

\* Not to be given, 1948-1949.

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. WILLIAMS in charge)

### MINERALOGY

#### LOWER DIVISION COURSES

- 4A. Elementary Mineralogy. (3) I. Mr. PABST, Mr. OGLE  
 One lecture and two three-hour laboratory periods weekly.  
 Prerequisite: Chemistry 1A-1B 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.  
 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.  
 Lectures on some of the principles of the formation, association, and transformation of minerals. 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.

#### GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

Research. (See Geology 220.)

282. Problems in Goniometry. (1-2) I and II. Mr. PABST  
 Prerequisite: consent of the instructor.  
 Practice in the measurement and projection of crystals.

\* Not to be given, 1948-1949.



## GERMAN

CLAIR HAYDEN BELL, Ph.D., Professor of German.

EDWARD V. BREWER, M.A., Professor of German (Chairman of the Department).

ARTHUR G. BRODEUR, Ph.D., Professor of Germanic Philology and English.

<sup>2</sup> 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, Clark University), Visiting 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.

JOHANNA E. MARTENSEN, A.B., Associate in German.

*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 83.

*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 315. 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.

## LOWER DIVISION COURSES

1. Elementary German. Beginners' Course. (4) I and II.

Mr. BEELER in charge

<sup>2</sup> In residence spring semester only, 1948-1949.

## 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.

Sec. 1: Physical Sciences.

Mrs. MARTENSEN

Sec. 2: Biological Sciences.

Mr. STRAUBINGER

Sec. 3: Humanities.

Miss BONWIT

## 2. Elementary German (continuation of 1). (4) I and II.

Mr. BEELER in charge

Prerequisite: course 1 or two years of high school German.

## 3. Intermediate German. (4) I and II.

Mr. LOOMIS 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. LOOMIS 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.

## 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.

## 9. Great Writers in German Literature. (No knowledge of German required.)

Any one of these courses is open to students in all departments of the University, major students in German excepted.

9A. Medieval Period. (1) I, Mr. Taylor.

9B. Eighteenth Century. (1) II, Miss Bonwit.

9C. Nineteenth Century. (1) I, Mr. Schneider.

9D. Twentieth Century. (1) II, Mr. Loomis.

## UPPER DIVISION COURSES

Prerequisite: 16 units of lower division courses.

## 100. Introduction to Modern German Literature. (3) I.

Mr. LOOMIS

## 104. Dramas of the Nineteenth Century. (3) II.

Mr. STRAUBINGER

## 106. Schiller's Dramas. (3) II.

Mr. BREWER

- \*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) I. Mr. GUDDÉ  
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) II. Mr. SCHNEIDER  
Prerequisite: 6 units from any of the above-listed upper division courses.
- 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) I. Mr. BELL  
Prerequisite: same as for course 114. This course should be taken together 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. BEELER  
Designed for prospective teachers and those planning to take linguistic courses.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Mr. LOOMIS in charge

\* Not to be given, 1948-1949.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

Prerequisite: for the literary courses, course 118A or 118B; for those in linguistics, ordinarily courses 135 and 140. For advanced study in German literature a reading knowledge of French is indispensable and a general acquaintance with German history strongly advised. For linguistic work some knowledge of Latin is required, 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) II. Mr. BELL  
Prerequisite: course 135.  
In 1948-1949 the special topic: The German Minstrel Epic.
204. The Poetry of the Elder Edda. (3) II. Mr. BRODEUR  
Prerequisite: German 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. Goethe (The Pre-Weimar Period). (2) II. Mr. WOLFF  
A study of Goethe's early works with chief emphasis on his lyric poetry, Werther, and Götz—discussion of the literary and philosophical trends of the period.
221. Goethe in Weimar to Schiller's Death. (2) I. Mr. WOLFF
222. Goethe's *Faust*. (3) II. Mr. PRICE
228. Early German Romanticism: 1795-1810. (3) I. Mr. BREWER
- \*229. Kleist, Büchner, Grabbe. (2) II. Mr. WOLFF
242. *Das Junge Deutschland*. (2) I. Mr. SCHNEIDER  
Special emphasis on Heine and Gutzkow.
- \*245. The Tale. (2) I. Mr. TAYLOR
250. Special Study for Graduate Students. (1-4) I and II.  
The STAFF (Mr. WOLFF in charge)

\* Not to be given, 1948-1949.

*Germanic Linguistics*

For the courses in English Philology see the Department of English, pages 309-314.

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|--|------------|
| *260. Germanic Linguistics. (3) I.   | Mr. BEELER |
| Prerequisite: some acquaintance with at least two of the older Germanic languages.   |            |
| Principles of change in sound, form, and meaning in the Germanic languages; the relationship of the Germanic languages to one another; the reconstruction of Proto-Germanic; Proto-Germanic and Indo-European. |            |
| *262. History of the German Language. (3) II.  | Mr. BEELER |
| 265. Gothic. (3) II.   | Mr. BEELER |
| 270. Old Saxon. (3) II.  | Mr. PALMER |
| 275. Old High German. (3) I.   | Mr. PALMER |
| *280. Old Icelandic. (3) II.   | Mr. BEELER |

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**GREEK**

For courses in the Greek language and literature see under Department of Classics, page 240.

\* Not to be given, 1948-1949.

## HISTORY

GEORGE H. GUTTRIDGE, M.A. (Cantab.), Professor of English History.

GEORGE P. HAMMOND, Ph.D., Professor of History.

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.

ROBERT J. KERNER, 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.

HERBERT E. BOLTON, Ph.D., Litt.D., L.H.D., LL.D., Sather Professor of  
History, Emeritus.

FREDERIC L. PAXSON, Ph.D., Litt.D., LL.D., Margaret Byrne Professor of  
United States History, Emeritus.

WOODBRIE 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.

GEORGE M. MCCUNE, Ph.D., Associate Professor of History.

PAUL B. SCHAEFFER, Ph.D., Associate Professor of European History.

\*ENGEL SLUTER, Ph.D., Associate Professor of History.

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.

KENNETH M. STAMPP, Ph.D., Assistant Professor of 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 83.

*Departmental Major Advisers:* Mr. GUTTRIDGE, Chairman; Mr. BINGHAM, Mr. KING, Mr. SCHAEFFER.

\* Absent on leave, 1948-1949.

† Sabbatical leave in residence, 1948-1949.

*Preparation for the Major.*—Required: History 4A-4B; and 8A-8B, 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 85.

*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

NOTE.—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. SCHAEFFER, Mr. GRIFFITHS

Course 4A is prerequisite to 4B for freshmen.

8A-8B. History of the Americas. (3-3) Yr.

Mr. KING

17A-17B. History of the United States. (3-3) Yr. Beginning each semester.

Mr. BEAN, Mr. DAVIS, Mr. HARPER, Mr. STAMPP

Prerequisite: sophomore standing.

This course satisfies the American History and Institutions requirement.

19A-19B. History and Civilizations of Asia. (3-3) Yr.

Mr. BINGHAM

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  
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 Revolu-  
tion. (3-3) Yr. Mr. SONTAG
- 135A-135B. History of Russian 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 economics.
- 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. Central Europe and the Near East. (3-3) Yr. Mr. KERNER
- \*141. History of Modern France. (3) I. Mr. PALM
- \*142A-142B. History of Modern Italy. (2-2) Yr. Mr. GRIFFITHS

\* Not to be given, 1948-1949.



- \*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 1945.
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
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) II.  
 Prerequisite: 151B or equivalent. Mr. GUTTRIDGE
157. Eighteenth-Century England. (2) II. Mr. GUTTRIDGE  
 Reading and discussion; restricted to students with previous knowledge of English history.
- 160A-160B. History of Spain and Portugal. (3-3) Yr. Mr. VAN NOSTRAND
- 161A-161B. Hispanic-American History. (3-3) Yr. Mr. KING  
 161A. The Colonies.  
 161B. Since Independence.
- \*162A-162B. The Caribbean and Northern South America. (2-2) Yr.  
 Mr. KING
- \*163. History of Brazil. (3) I. 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.  
 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.

\* Not to be given, 1948-1949.

173. The Era of Sectional Conflict. Mr. STAMPP  
 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. Mr. HICKS  
 174A. 1896-1920.  
 174B. 1920-1949.
- 176A-176B. Social History of the United States. (3-3) Yr. Mr. HICKS  
 176A. 1750-1850.  
 176B. 1850-1949.
- 177A-177B. History of the United States, 1787-1845. (3-3) Yr. Mr. BEAN  
 177A. The Constitution and the Early Union to 1815.  
 177B. The Jacksonian Era.  
 Prerequisite: course 17A-17B. Course 177A is not prerequisite to 177B.
- \*181A-181B. The History of North America. (3-3) Yr. Mr. KINNAIRD
- \*183. Economic Exploitation of Colonial America. (3) II. Mr. SLUTTER
- 187A-187B. The West in United States History, 1763-1893. (2-2) Yr.  
 Prerequisite: course 17A-17B. Mr. DAVIS
- \*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. MCCUNE  
 192A. Transition from the Chinese Imperial system to modern period of western diplomacy.  
 192B. Russo-Japanese War to the present.
- \*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
- 196A-196B. Rise of Modern Institutions in Japan. (2-2) Yr. Mr. BROWN
- \*197A-197B. Korean History. (2-2) Yr. Mr. 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.

\* Not to be given, 1948-1949.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

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
- 241A-241B. Seminar in Modern European History. (2-2) Yr. Mr. PALM
- \*243A-243B. Seminar in Modern European History. (2-2) Yr. Mr. SONTAG
- 249A-249B. Seminar in Modern European History. (2-2) Yr.  
Mr. KERNEE, Mr. LANTZEFF
- 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.
- 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 Diplomatic History of the United States. (2-2) Yr.
- 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 Reconstruction. (2-2) Yr. Mr. STAMPP
- 274A-274B. Seminar in the Recent History of the United States. (2-2) Yr.  
Mr. HICKS
- 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. McCUNE
- 295A-295B. Seminar in Japanese History. (2-2) Yr. Mr. BROWN
298. Directed Research. (2-4) I and II. The STAFF

\* Not to be given, 1948-1949.

## 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.
- <sup>2</sup> CATHERINE LANDRETH, 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.
- <sup>2</sup> JEAN WARREN, Ph.D., Assistant Professor of Home Economics, Davis.
- R. LORENE DRYDEN, B.S., Associate in Home Economics, Davis.
- AGNES C. McCLELLAND, M.A., Associate in Home Economics.

- 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, M.S., Lecturer in Textiles.
- MAURICE SANDS, Lecturer in Home Furnishing.
- EVE W. STRAIGHT, B.S., Lecturer in Institution Management.

*Letters and Science List.*—Courses 1A-1B, 7, 10, 14, 101A-101B, 102A-102B, 103, 106, 120A-120B, 132, 134, 142, 160, and 190 are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

*Curriculum in Home Economics.*—The requirements for this curriculum offered in the College of Agriculture are stated on page 90.

## 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.
5. Elementary Clothing Study. (3) I. Miss McCLELLAND  
Lecture and laboratory.  
Prerequisite: Decorative Art 16A-16B.  
Practical and cultural problems in modern garment design and construction.
7. Introduction to Textiles. (3) II. Miss JONES  
Lectures and laboratory.  
Prerequisite: Chemistry 1A and 8.  
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.

<sup>2</sup> In residence spring semester only, 1948-1949.

10. 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. (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 or concurrent: courses 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 and laboratory.  
Prerequisite: courses 1A-1B and 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 and laboratory.  
Prerequisite: course 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  
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.
125. Recent Advances in Food Technology. (2) II. Miss KENNEDY  
Prerequisite: course 101A.  
A proseminar on late research in the chemistry of food composition, preparation, and control.
126. Introduction to Research in Food Preparation and Control. (2) II. Miss KENNEDY  
Two laboratory periods a week to be arranged. To be taken concurrently with course 125.

\* Not to be given, 1948-1949.

*Nutrition and Dietetics*

- 102A-102B. Food and Dietetics. (3-3) Yr. Miss OKEY  
Lectures and laboratory.  
Prerequisite: Chemistry 1A and 8, Physiology 1A, 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.
103. Elementary Nutrition. (3) I. Mrs. COOK  
Prerequisite: Chemistry 1A or high school chemistry and Physiology 1A.  
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.)
106. Laboratory Methods in Metabolism. (3) II. Miss OKEY  
Lecture and laboratory.  
Prerequisite: course 101A or Chemistry 5, and 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.
- 120A-120B. Human Nutrition and Dietetics. (4-5) Yr.  
Mrs. MORGAN, Miss ARNICH  
Lectures and laboratory. For course 120B there is an additional laboratory period.  
Prerequisite: course 101A and Biochemistry 103, or course 101A and 106.  
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.
- \*130. The Nutrition of Development. (2 or 3) II. Mrs. MORGAN  
Lectures, laboratory, and field work.  
Prerequisite: course 120A 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.
196. Dietary Problems. (3) II. Mrs. COOK  
Lecture and laboratory.  
Prerequisite or concurrent: course 120A-120B.  
Problems in the planning and computation of dietaries for normal and pathological conditions.

*Institution Economics*

110. Institution Food Study. (4) I. Miss GILLUM, Miss STRAIGHT  
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.

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\* Not to be given, 1948-1949.

111. Institution Organization and Management. (3) II.  
Lectures and field or laboratory work. Miss GILLUM, Miss STRAIGHT  
Prerequisite: course 110 or consent of the instructor. Recommended:  
Business Administration 6A, 151, or Psychology 3 or 185.  
The principles and problems involved in the organization and manage-  
ment of institution households such as residence halls, hospitals, hotels.
- 198A-198B. Proseminar in Hospital Dietetics. (2-2) Yr. Miss GILLUM  
Open only to selected graduate students; given on the San Francisco  
campus.
497. Hospital Problems. (2) I and II. Miss GILLUM  
Supervised practice in administrative problems of the hospital dietetic  
service carried on during residence in Berkeley and open only to selected  
graduate students.
498. Hospital Dietetics. (6) I and II. Miss GILLUM  
Conferences and supervised practice in the dietetics department of the  
University of California Hospital and clinics.  
Open only to selected graduate students.

*Family Economics*

140. Home Management. (3) II. Miss BREMNER  
Lectures and laboratory.  
Prerequisite: Civil Engineering 125.  
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. (3) I and II. Miss BREMNER  
Prerequisite: Home Economics 140. (This 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 completed or taken concurrently.  
A study of the functions and structure of the market from the stand-  
point of consumers; evaluation of the guides available for consumers in  
buying; agencies aiding and protecting consumers.
142. Social Problems of Families. (3) II. Miss COLES  
Prerequisite: Economics 1A-1B, and either Economics 40 or Psychol-  
ogy 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 40 or Psychol-  
ogy 5.  
Management of personal and family finances—money income, house-  
hold production, planning expenditures, credit, savings, investments, financ-  
ing home ownership.

*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 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.  
Laboratory supplement to course 132 conducted at the nursery school.
- \*134. Child Care. (3) I. Miss LANDRETH  
Prerequisite: Physiology 1A, and (for nonmajor students) courses 10 or 103 should precede or be taken concurrently.  
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) 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) II. 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.

*Clothing and Textiles*

160. Textiles. (3) I. Miss JONES  
Lectures and laboratory.  
Prerequisite: course 7.  
Technical analyses and evaluations of textile fibers and fabrics.
162. Clothing Economics. (3) I. Miss JONES  
Lectures and laboratory.  
Prerequisite: course 7 and Economics 1A-1B.  
A study of the problems involved in the selection, purchase, and care of textiles and clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries.
163. Dress Design and Fashion Analysis. (3) II. Miss McCLELLAND  
Prerequisite: course 5.  
The design, draping, and construction of garments and costumes based on the principles of design and color theory; past and current fashion trends and fashion merchandising methods.
167. Clothing Design and Construction. (3) II. Miss McCLELLAND  
Prerequisite: courses 5 and 7.  
Lecture and laboratory.  
Theory and practice of costume design and construction.

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\* Not to be given, 1948-1949.



*Home Furnishing*

190. Home Furnishing. (3) II. Mr. SANDS  
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.

## SPECIAL STUDY COURSE

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 156.

214. Research in Food and Nutrition. (2-6) I and II.  
The STAFF (Mrs. MORGAN in charge)
216. Seminar in Foods. (2) I. Miss OKEY
219. Seminar in Nutrition. (2) II. Mrs. MORGAN
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
5. Elementary Clothing Study. (3) I. Miss DRYDEN
7. Introduction to Textiles. (3) II. Miss DRYDEN
10. Nutrition. (2) II. Mrs. JENTSCH
- \*14. Consumer Problems. (2) II. Miss WARREN

*Food Economics and Technology*

- \*100. Food Economics. (3) II. \_\_\_\_\_

*Nutrition and Dietetics*

- 102A-102B. Food and Dietetics. (3-3) Yr. \_\_\_\_\_

*Child Development*

132. Child Psychology. (3) I. \_\_\_\_\_

133. Laboratory in Child Development. (1) I. \_\_\_\_\_

134. Child Care. (3) II. \_\_\_\_\_

\* Not to be given, 1948-1949.

*Home Economics**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) II.	Miss WARREN

*Clothing and Textiles*

162. Clothing Economics. (3) I.	Miss DRYDEN
167. Clothing Design and Construction. (3) II.	Miss DRYDEN

*Housing and House Furnishing*

*150. The House. (2) II.	Mrs. HEINEMAN
190. Home Furnishing. (2) II.	Mrs. HEINEMAN

## SPECIAL STUDY COURSE

199. Special Study for Advanced Undergraduates. (1-5) Yr.	The STAFF (Miss WARREN in charge)
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## DECORATIVE ART

16A-16B. Theory of Design and Color. (2-2) Yr.	Mrs. HEINEMAN
130A. Interior Design. (2) I.	Mrs. HEINEMAN

\* Not to be given, 1948-1949.

HE 102 B  
134

Jentsch  
McNeil

## ITALIAN

RUDOLPH ALTROCCHI, Ph.D., Professor of Italian.

MICHELE DE FILIPPIS, Ph.D., Professor of Italian (Chairman of the Department).

*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 83.

*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 may be 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.

## 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. ALTROCCHI and Assistant

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. ALTROCCHI

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.

\* Not to be given, 1948-1949.

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 156.

\*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.

\*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

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\* Not to be given, 1948-1949.

## JOURNALISM

\*ROBERT W. DESMOND, Ph.D., Professor of Journalism.

PHILIP F. GRIFFIN, M.A., Assistant Professor of Journalism.

JOHN V. LUND, A.B., Assistant Professor of Journalism (Chairman of the Department).

<sup>1</sup>GORDON PATES, A.B., Associate in Journalism.

JOHN G. TREZEVANT, A.B., Associate in Journalism.

GEORGE W. SEIDL, A.B., Lecturer in Journalism.

CLAIRE M. HAMILTON, M.A., Lecturer in Journalism.

JAMES E. MURRAY, A.B., Lecturer in Journalism.

<sup>1</sup>LLOYD E. REEVE, Lecturer in Journalism.

<sup>2</sup>JOHN H. THOMPSON, Lecturer in Radio News Writing.

*Letters and Science List.*—Courses 20A-20B, 140, 141, and 190 are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

*Departmental Major Advisers:* Mr. DESMOND, Mr. GRIFFIN, Mr. LUND.

*Preparation for the Major.*—Required: History 4A-4B, Political Science 1, 2, Economics 1A-1B, English 1A-1B or Speech 1A-1B, course 20A-20B. Recommended: the following courses may be helpful in fulfilling the requirements for the Associate in Arts degree, although none is specifically required for the major: Philosophy 6A-6B or 10A-10B; English 30, 44A-44B, 46A-46B; Geography 1; Physics 10; Zoölogy 10; Anthropology 1.

*The Major.*—The major consists of 35 or 36 units of upper division work taken in accordance with a plan approved by the major adviser.

Required: two concentrations of 9 units, or one concentration of 18 units in a field or fields to be selected in consultation with the major adviser. Also required: course 130A-130B, 140, 141 (totaling 12 units), plus 6 units to be selected from the following: courses 150, 170, 171, 190, 198, 199; Business Administration 123, 125.

NOTE.—Prospective majors are to submit, in writing, a proposed plan for 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 to arrange a program.

Admission to the major is contingent upon the student achieving at least a B grade in course 20B. 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. Failure to meet this requirement may result in a student being required to withdraw from the major at any time.

## LOWER DIVISION COURSE

20A-20B. News Writing and Reporting. (3-3) Yr. Mr. SEIDL, Mr. MURRAY

Two lectures a week and one two-hour laboratory section.

Prerequisite: English 1A-1B or Speech 1A-1B and sophomore standing, or consent of the instructor. Course 20A is prerequisite to 20B.

A study of the nature of news and the methods by which it is obtained, organized, and written.

\* Absent on leave, 1948-1949.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

## UPPER DIVISION COURSES

- 130A-130B. News Editing. (3-3) Yr. Mr. LUND, Mr. SEIDL  
 One lecture and two two-hour laboratory sections.  
 Prerequisite: course 20A-20B with at least a grade of B in 20B. Students who have not completed 20A-20B will be admitted to 130A only upon achieving at least a B grade in a qualifying examination to be given the Monday preceding beginning of instruction. Course 130A is prerequisite to 130B.  
 Techniques of copyreading and headline writing, theories of news selection and makeup, examination of newspaper editorial practices.
140. History of Journalism. (3) I. Mr. GRIFFIN  
 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. GRIFFIN  
 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. GRIFFIN  
 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 interpretative forms.
170. Principles of Publishing. (3) I. Mr. LUND  
 Two lectures a week and one two-hour laboratory section.  
 Prerequisite: courses 20A-20B, 130A-130B, or consent of the instructor.  
 Analysis of the economy, organization, and operation of daily and weekly newspapers.
171. Newspaper Advertising. (3) I and II. Mr. LUND  
 Two lectures a week and one two-hour laboratory period.  
 Prerequisite: courses 20A-20B, 130A-130B, or consent of the instructor.  
 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 public 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.

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\* Not to be given 1948-1949.

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.

Sec. 3. Radio News Writing. (3) II.

Mr. THOMPSON

Lectures and discussions.

Class limited to twenty-five, 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, J.D., Ph.D., LL.D., Professor of Law.  
 HENRY W. BALLANTINE, A.B., LL.B., LL.D., John H. Boalt 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.  
 ALEXANDER M. KIDD, A.B., LL.B., Elizabeth Josselyn Boalt Professor of Law.  
 JAMES PATTERSON MCBAIN, LL.B., LL.D., A. F. and May T. Morrison Professor of Municipal Law.  
 MAX RADIN, A.B., LL.B., Ph.D., LL.D., John H. Boalt Professor of Law, Emeritus.  
 STANLEY S. SURREY, B.S., LL.B., Professor of Law.  
 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.

- WILLIAM T. LAUBE, A.B., J.D., LL.M., Lecturer in Law.  
 VERNON M. SMITH, A.B., LL.B., Librarian of the Law Library and 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. (2-3) Yr.                | Mr. BALLANTINE, Mr. LAUBE  |
| 202. Crimes. (3) I.                            | Mr. KIDD                   |
| 204. Introduction to Law. (2) I.               | Mr. LAUBE                  |
| 206A-206B. Procedure: First Course. (2-3) Yr.  | Mr. MCBAIN                 |
| 208. Property: First Course. (3) I.            | Mr. FERRIER                |
| 210. Remedies in Equity. (3) II.               | Mr. BALLANTINE, Mr. NEWMAN |
| 212A-212B. Torts. (2-2) Yr.                    | _____                      |
| 214. Constitutional Law: First Course. (3) II. | Mr. BARRETT                |

## Second Year

220. Administrative Law: First Course. (3) I.	Mr. NEWMAN
**222. Commercial Associations. (2) I.	Mr. JENNINGS
224A-224B. Commercial Paper and Security. (2-3) Yr.	Mr. KIDD
†225. Constitutional Law. (2) I.	Mr. BARRETT
**226. Constitutional Law: Second Course. (2) I.	Mr. BARRETT
228A-228B. Corporations. (2-2) Yr.	Mr. BALLANTINE
230. Marital Property. (2) I.	Mrs. ARMSTRONG
232. Procedure: Second Course. (2) II.	Mr. BARRETT
234. Property: Second Course. (3) II.	Mr. FERRIER
236. Trusts. (2) I.	Mr. JENNINGS
237. Taxation: First Course. (3) II.	Mr. SURREY
238. Writing. (No unit credit) Yr.	Mr. SMITH

## Third Year

240. Administrative Law: Second Course. (2) II.	Mr. NEWMAN
*242. Admiralty. (2) I.	_____
244. Creditors' Rights. (3) I.	_____
245. Comparative Law. (2) I.	Mr. EHRENZWEIG
246. Conflict of Laws. (3) II.	Mr. EHRENZWEIG
247. Corporation Finance. (2) I.	Mr. JENNINGS
250A-250B. Evidence (2-2) Yr.	Mr. MCBAIN
253. Family Law. (2) II.	Mrs. ARMSTRONG
254. Federal Jurisdiction. (2) I.	_____
256. Future Interests. (2) I.	Mr. FERRIER
257. Insurance. (2) I.	Mr. EHRENZWEIG
258. International Law. (2) II.	_____
260. Jurisprudence. (2) II.	Mr. EHRENZWEIG
262. Labor Law: First Course. (2) I.	Mrs. ARMSTRONG

\* Not to be given, 1948-1949.

\*\* Not to be given, 1948-1949. Will be given in Summer Sessions, 1949.

† To be given 1948-1949 only.

264. Labor Law: Second Course. (2) II.	Mrs. ARMSTRONG
266. Legislation. (2) I.	Mr. SURREY
268. Municipal Corporations. (2) II.	Mr. JENNINGS
270. Government Regulation. (2) I.	Mr. NEWMAN
274. Restitution. (2) II.	Mr. LAUBE
276. Restraint of Trade and Unfair Competition. (3) II.	Mr. JENNINGS
278. Security Transactions. (2) II.	Mr. KIDD
*280. Suretyship. (2) I.	—————
†281. Income Taxation. (3) I.	Mr. SURREY
282. Taxation: Second Course. (2) II.	Mr. SURREY
*284. Taxation: Third Course. (2) II.	Mr. SURREY
*286. Wills and Administration. (2) II.	Mr. FERRIER

#### 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 and Mr. JENNINGS
289A-289B. Seminar in Commercial Transactions. (2-2) Yr.	Mr. KIDD and Mr. LAUBE
290A-290B. Seminar in Constitutional Law. (2-2) Yr.	Mr. BARRETT
291A-291B. Seminar in Criminal Law and Procedure. (2-2) Yr.	Mr. KIDD
292A-292B. Seminar in International and Maritime Law. (2-2) Yr.	—————
293A-293B. Seminar in Labor Law and Procedure. (2-2) Yr.	Mrs. ARMSTRONG and 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 and Mr. SURREY
296A-296B. Seminar in Practice and Procedure. (2-2) Yr.	Mr. BARRETT and Mr. MCBAIN
297A-297B. Seminar in Property and Trust Administration. (2-2) Yr.	Mr. FERRIER and 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

\* Not to be given, 1948-1949.

† To be given 1948-1949 only.

## LIBRARIANSHIP

DONALD CONEY, M.A., Professor of Librarianship.

EDITH M. COULTER, M.A., B.L.S., Professor of Librarianship.

J. PERIAM DANTON, Ph.D., Professor of Librarianship (Chairman of the Department).

<sup>2</sup> CARLETON B. JOECKEL, Ph.D., Professor of Librarianship.

SYDNEY B. MITCHELL, M.A., Professor of Librarianship, Emeritus.

DELLA J. SISLER, M.A., B.L.S., Associate Professor of Librarianship, Emeritus.

LEROY C. MERRITT, Ph.D., Associate Professor of Librarianship.

ANNE ETHELYN MARKLEY, M.A., Assistant Professor of Librarianship.

JOHN B. TOMPKINS, Ph.D., Instructor in Librarianship.

JESSIE E. BOYD, M.A., Cert. in Libr., Lecturer in Librarianship.

DOUGLAS W. BEYANT, M.A., Lecturer in Librarianship.

LEONE GARVEY, M.A., Lecturer in Librarianship for the spring semester.

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 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

<sup>2</sup> In residence spring semester only, 1948-1949.

a fair degree of speed is expected of all students. Experience in library work is highly desirable but is not required for admission.

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, history of education, educational psychology, and junior high school education or elementary education (totaling at least 9 units).

#### PROFESSIONAL COURSES

In 1948-1949, 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.

#### 202. Bibliography and Reference Materials. (3) I.

Miss COULTER

Basic reference materials including national and subject bibliography. Lectures, discussions, and reports on assigned problems.

#### 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: Institutions, Means, Users. (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 service 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 is placed 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 discs, film, and wire.

212. Reference and Government Publications. (4) II. Miss COULTER  
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  
Simple descriptive cataloguing; simplified and 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  
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 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.

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. Miss COULTER  
 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 COULTER  
 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, 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. Miss COULTER  
 Subject: Junior College Libraries.  
 Problems and practices of secondary school libraries, with emphasis on the collections and instructional program of the junior college library.



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. (2-4) 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.

## MATHEMATICS

BENJAMIN A. BERNSTEIN, Ph.D., Professor of Mathematics.

THOMAS BUCK, Ph.D., Professor of Mathematics.

<sup>1</sup> GRIFFITH C. EVANS, Ph.D., Professor of Mathematics (Chairman of the Department).

DERRICK H. LEHMER, Ph.D., Professor of Mathematics.

HANS LEWY, Ph.D., Professor of Mathematics.

MICHEL LOÈVE, Docteur ès Sciences, Professor of Mathematics.

CHARLES B. MORREY, JR., Ph.D., Professor of Mathematics (Vice-Chairman of the Department).

JERZY NEYMAN, Ph.D., Professor of Mathematics and Director of the Statistical Laboratory.

† 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.

FRANK IRWIN, Ph.D., Associate Professor of Mathematics, Emeritus.

ALFRED L. FOSTER, Ph.D., Associate Professor of Mathematics.

JOHN L. KELLEY, Ph.D., Associate Professor of Mathematics.

SOPHIA LEVY McDONALD, Ph.D., Associate Professor of Mathematics.

\* ANTHONY P. MORSE, Ph.D., Associate Professor of Mathematics.

RAFAEL M. ROBINSON, Ph.D., Associate Professor of Mathematics.

RAYMOND H. SCIOBERETI, Ph.D., Associate Professor of Mathematics.

<sup>2</sup> PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.

<sup>3</sup> FRANTISEK WOLF, Ph.D., Associate Professor of Mathematics.

\* ELMER C. GOLDSWORTHY, 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. SWINFORF, Ph.D., Assistant Professor of Mathematics.

ARTHUR E. WILLIAMS, Ph.D., Assistant Professor of Mathematics.

EDWARD W. BARANKIN, Ph.D., Instructor in Mathematics.

STEPHEN P. DILIBERTO, Ph.D., Instructor in Mathematics.

ROBERT C. JAMES, Ph.D., Instructor in Mathematics.

STANLEY NASH, M.A., Associate in Mathematics.

TING K. PAN, M.A., Associate in Mathematics.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

<sup>3</sup> Sabbatical leave in residence fall semester; sabbatical leave spring semester, 1948-1949.

\* Absent on leave, 1948-1949.

† Sabbatical leave in residence. 1948-1949.

- TOM M. APOSTOL, M.S., Lecturer in Mathematics.  
 EVELYN FIX, Ph.D., Lecturer in Mathematics.  
 JOSEPH L. HODGES, JR., A.B., Lecturer in Mathematics.  
 TERRY A. JEEVES, A.B., Lecturer in Mathematics.  
 GEORGE M. KUZNETS, Ph.D., Associate Professor of Agricultural Economics.  
 SEGFRIED F. NEUSTADTER, M.A., Lecturer in Mathematics.  
 HUGO B. RIBEIRO, Ph.D., Lecturer in Mathematics.  
 ELIZABETH L. SCOTT, A.B., Lecturer in Mathematics.  
 MARIANNE F. SMITH, Ph.D., Lecturer in Mathematics.  
 VIRGINIA W. WAKERLING, Ph.D., 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 83.

*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. 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.*—Mathematics 2, mathematics of finance and business, is a prerequisite for students in the School of Business Administration. As an alternative, however, Mathematics 11A–11B, analytic geometry and calculus, or Mathematics 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. FOSTER 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.
- G. Solid Geometry. (2) I and II. Mr. LEHMER and the STAFF  
 (Formerly numbered E.)
- D. Intermediate Algebra. (3) I and II. Mr. ROBINSON and the STAFF  
 (Formerly numbered I.)  
 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.
1. College Algebra. (3) I and II. Mr. PINNEY 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 Mechanical 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; plane geometry, plane trigonometry. Students 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. See announcements of qualifying examinations on bulletin boards. Students who fail this test will be required to pass course 1 before taking course 3A.  
 Elements of differential calculus and analytic geometry.

- 3B. Analytic Geometry and Calculus, Second Course. (3) I and II.  
Prerequisite: course 3A or course 11A-11B. Mr. JAMES and the STAFF  
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.
- 3H. Analytic Geometry and Calculus, Second Course. (4) I and II. Mr. JAMES  
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. APOSTOL 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. APOSTOL  
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. BARANKIN 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. MORREY  
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. ROBINSON, Mrs. SMITH  
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. PAN  
 (Formerly number 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. \_\_\_\_\_  
 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.  
 NOTE.—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.  
 Mr. BUCK, Mrs. McDONALD, Mr. RIBEIRO, 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 (formerly 6). 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. Mr. KELLEY  
 Prerequisite: courses 3A-3B, 8.  
 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. DILIBERTO, Mr. JAMES, Mr. KELLEY, Mr. LEHMANN, Mrs. McDONALD, Mr. MORREY, Mr. NEUSTADTER, Mr. RIBEIRO, Mr. SCIOBERETI, Mrs. SMITH, Mr. SWINFORD, Mrs. WAKERLING, Mr. WILLIAMS  
 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. JAMES, Mrs. SMITH  
 Prerequisite: courses 4A-4B, 8.  
 Linear dependence, matrices, invariants, quadratic forms.
- 111B. Algebra. (3) I and II. Mr. FOSTER  
 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 (formerly 6), 111A.  
 Projective coördinates. Loci of the second order. Higher plane curves.
- 112B. Metric Differential Geometry. (3) I and II. Mrs. WAKERLING, Miss SPERRY  
 Prerequisite: course 4A-4B. Course 112A is not prerequisite to 112B.  
 Vector analysis. Study of curves and surfaces in three dimensions.
113. Probability and Statistics. Second Course. (3) I. (See Statistics below.)
- 115A-115B. The Theory of Numbers. (3-3) Yr. Mr. LEHMER  
 Prerequisite: course 8. Course 115A is not prerequisite to 115B.  
 Divisibility, congruences, number systems.
117. Analysis of Mathematical Problems. (2) I and II. Mr. RIBEIRO  
 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) I and II. Mr. LEWY  
 Prerequisite: senior standing in mathematics.  
 Continuation of course 117, intended primarily for honor students.
- 119A-119B. Differential Equations. (3-3) Yr.  
 Mr. BARANKIN, Mr. DILIBERTO, Mr. JAMES, Mr. LEWY, Mr. SCIOBERETI, Mr. SWINFORD  
 Prerequisite: 4A-4B, with honor grades; or 14A-14B; or 4A-4B and 110A-110B; or consent of the instructor.  
 NOTE.—119A and 119B will both be offered each semester.  
 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 185 or course 201B.
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 156.

- 201A-201B. Function Theory. (3-3) Yr. Mr. EVANS, Mr. JAMES  
Prerequisite: courses 111A, 119A-119B.  
Point sets in Euclidean space, measure, generalizations of integral

\* Not to be given, 1948-1949.



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 courses 150A-150B and 185.

205A-205B. Theory of Functions of a Complex Variable. (3-3) Yr.

Prerequisite: course 201A-201B.

Mr. LEHMER

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. ROBINSON

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. KELLEY

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.

\*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. FOSTER

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 super-sonic velocities.

\* Not to be given 1948-1949.

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 1948-1949 there will be, in particular, lecture seminars on the following subjects, in charge of the persons indicated:  
 (a) Postulate theory, I, II, Mr. Bernstein; (c) Topics in analysis, I, Mr. Wolf; (d) Theory of elasticity, I, Mr. Pinney; (e) Topics in algebra and metamathematics, I, II, Mr. Tarski; (h) Topics in number theory, I, II, Mr. Lehmer; (j) Selected topics in abstract algebra, I, II, Mr. Foster; (k) Finite dimensional unitary spaces, II, Mr. Barankin; (p) Selected probability problems of physics, I, Mr. Loève; (s) Statistical seminar, I, II, Mr. Neyman.

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.  
 (Formerly numbered 12A.) Mr. NEYMAN, Mr. BARANKIN  
 Prerequisite: course D.

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. JEEVES, Mr. LEHMANN  
 Prerequisite: courses 3A-3B, 12 (formerly numbered 12B).  
 Continuation of course 12. Continuous probability laws. Expectation, variance, correlation, regression. Simple examples of least squares estimates. Basic ideas of confidence intervals. Applications.
- 120A-120B. Theory of Probability and Statistics. (3-3) Yr. Miss FIX  
 Prerequisite: course 4A-4B (with honor grades) or 4A-4B and 12 and 113; 150A-150B (may be taken concurrently). It is recommended that 120c-120d be taken concurrently.  
 Continuation of course 113. Theorem of Laplace and the mathematical law of large numbers. Order statistics. Lambda criterion and maximum likelihood estimates. Markoff theorem. Analysis of variance. Applications.
- 120c-120d. Laboratory Course in Theory of Probability and Statistics. (1-1) Yr.  
 Miss FIX and Assistant  
 May be taken in conjunction with course 120A-120B.

128. Numerical Analysis. (See Mathematics, above.)

130A-130B. Statistical Inference. (3-3) Yr.

Mr. HODGES

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.

NOTE.—Students having credit for course 120A-120B, given after September 1947, cannot take course 130A-130B for credit.

130C-130D. Laboratory Course in Statistical Inference. (1-1) Yr.

Mr. HODGES and Assistant

May be taken in conjunction with course 130A-130B.

132. Descriptive Statistics. (3) II.

Miss SCOTT

Lectures and laboratory.

Prerequisite: course 120A; or courses 4A-4B, 130A.

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.

142B will be given each semester.

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 and Assistant

May be taken in conjunction with course 142A-142B.

142D will be given each semester.

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.

#### GRADUATE COURSES

NOTE.—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. STEIN, Mr. LEHMANN  
Prerequisite: courses 111A, 120A-120B, and 185, or 201A-201B.  
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. STEIN, Mr. LEHMANN  
May be taken in conjunction with course 260A-260B.
261. Statistical Problems in Experimentation. (3) I.  
Lectures and laboratory. Mr. STEIN and Assistant  
Prerequisite: course 130A-130B or 12 and 113.  
Statistical hypotheses and tests; power function as a basis of a choice between alternative tests; mathematical models of experimental problems; theorems of Liapounoff and Kozakiewicz; linear hypotheses; chi-square tests and their power; random and systematic designs; complex experiments.
263. Statistical Studies of Risks. (3) II. Mr. STEIN and Assistant  
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) I.  
Lectures and laboratory. Mr. LEHMANN and Assistant  
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. LOÈVE  
Prerequisite: course 185 or 201A-201B.  
NOTE.—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  $\chi^2$  Test. (3) II. Mr. NEYMAN  
 Prerequisite: course 260A.  
 Generalized theorem of Laplace. Tests equivalent in the limit. Various aspects of the  $\chi^2$  Test. Best asymptotically normal estimates.
- 269A-269B. Recent Developments in the Theory of Statistics. (3-3) Yr. Mr. LEHMANN, Mr. STEIN  
 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. Mr. NEYMAN  
 Prerequisite: course 130A-130B.  
 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.  
 May be taken in conjunction with course 280A-280B. Mr. NEYMAN
- 290P. Selected Probability Problems of Physics. (2-6) I. Mr. LOÈVE
- 290S. Statistical Seminar. (2-6) I and II. Mr. NEYMAN in charge
- 295S. Individual Research Leading to Higher Degree. (2-6) I and II.  
 Mr. NEYMAN

**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 83.

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**

- WILLIAM L. RITTER**, Colonel, Infantry; Professor of Military Science and Tactics (Chairman of the Department).
- 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.
- CARL B. BARNES**, Major, Infantry; Associate Professor of Military Science and Tactics at Davis.
- DON O. CURRIE**, 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.
- KENNETH E. PELL**, Major, Coast Artillery Corps; Associate Professor of Military Science and Tactics.
- RUSSELL R. 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. BENNETT**, Captain, Infantry; Assistant Professor of Military Science and Tactics.
- CHARLES A. BUCK**, Captain, Coast Artillery Corps; Assistant Professor of Military Science and Tactics.
- NORMAN L. HOLLAND**, Captain, Ordnance Department; Assistant Professor of Military Science and Tactics.
- EUGENE L. NOREEN**, Captain, Infantry; Assistant Professor of Military Science and Tactics.
- STEPHEN V. RALPH**, Captain, Infantry; Assistant Professor of Military Science and Tactics.
- PAUL J. REINHALTER**, Captain, Field Artillery; Assistant Professor of Military Science and Tactics.
- EDGAR B. WARNER**, Captain, Corps of Engineers; Assistant Professor of Military Science and Tactics.
- NORMAN E. MEYER**, First Lieutenant, Transportation Corps; Instructor in 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 83.

#### RESERVE OFFICERS' TRAINING CORPS

The courses in the training of Infantry, Coast Artillery Corps, Signal Corps, Ordnance, Corps of Engineers, Quartermaster Corps, Transportation Corps, and Corps of Military Police are those prescribed by the War Department 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 War 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 male students who are citizens of the United States.

#### 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-three 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 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 of such courses.

- 10A. Basic (First Year). (2) I. The STAFF  
Three hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Required of all physically fit male students unless specific exemption is granted.  
Military organization; leadership, drill and exercise of command; individual weapons and marksmanship; National Defense Act and R.O.T.C.
- 10B. Basic (First Year). (2) II. The STAFF  
Three hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Required of all physically fit male students unless specific exemption is granted.  
Hygiene and first aid; leadership, drill, and exercise of command; maps and aerial photographs.
- 11A. Basic (Second Year). (2) I. The STAFF  
Three hours of classwork and one hour of leadership, drill, and exercise of command a week.



Required of all physically fit male students unless specific exemption is granted.

Leadership, drill, and exercise of command; maps and aerial photographs; military administration; military law and boards.

11B. Basic (Second Year). (2) II.

The STAFF

Three hours of classwork and one hour of leadership, drill, and exercise of command a week.

Required of all physically fit male students unless specific exemption is granted.

Leadership, drill, and exercise of command; physical development methods; evolution of warfare.

UPPER DIVISION COURSES

Infantry, Coast Artillery Corps, Ordnance, Signal Corps, Corps of Engineers, Quartermaster Corps, Transportation Corps, and Corps of Military Police Units.

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 War.

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.

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.

106A. Advanced Infantry (First Year). (3) I.

The STAFF

Four hours of classwork and one hour of leadership, drill, and exercise of command a week.

For selected students who have successfully completed the basic course or its equivalent.

Military leadership; psychology and personnel management; military law and boards; organization; communication; gunnery; technique of fire and fire control; motors and transportation; troop movement.

106B. Advanced Infantry (First Year). (3) II.

The STAFF

Four hours of classwork and one hour of leadership, drill, and exercise of command a week.

Leadership, drill, and exercise of command; military problems of the United States; tactics; military team; gunnery; technique of fire and fire control.

107A. Advanced Infantry (Second Year). (3) I.

The STAFF

Four hours of classwork and one hour of leadership, drill, and exercise of command a week.

Leadership, drill, and exercise of command; military teaching methods; 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  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Geographical foundation of national power; command and staff; troop movements; tactics.
- 126A. Advanced Corps of Engineers (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology and personnel management; military law and boards; organization of engineer units; the place of engineers in the military team; bridge design and classification; organization of the ground and field fortifications; engineer reconnaissance; explosives and demolitions.
- 126B. Advanced Corps of Engineers (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; camouflage; military roads; military sketching; job management; engineer combat principles.
- 127A. Advanced Corps of Engineers (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercises of command; military teaching methods; psychological warfare; military mobilization and demobilization; air-borne and amphibious operations; engineer supply; engineer estimates and orders; engineer combat principles; engineer reconnaissance.
- 127B. Advanced Corps of Engineers (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Geographical foundation of national power; command and staff; river crossing operations; construction utilities; water supply; engineer signal communications.
- 136A. Advanced Signal Corps (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology and personnel management; military law and boards; signal communication for all arms and services; organizations and missions of the signal corps; organization of the infantry division and its signal and communication components; message center and signal center procedure.

- 136B. Advanced Signal Corps (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; field wire communication fundamentals; field radio communication fundamentals; communication security; place of the Signal Corps in the military team; Signal Corps photography.
- 137A. Advanced Signal Corps (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military teaching methods; psychological warfare; military mobilization and demobilization; wire communication matériel.
- 137B. Advanced Signal Corps (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Geographical foundation of national power; command and staff, applied signal communication (Division); signal supply and repair; higher echelon signal communication and equipment.
- 146A. Advanced Coast Artillery (AA) (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology and personnel management; military law and boards; organization; motors and transportation; troop movements; communications; characteristics of matériel (AW); basic gunnery and fire control (AW).
- 146B. Advanced Coast Artillery (AA) (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; characteristics of matériel; basic gunnery and fire control (guns); antiaircraft artillery tactics; the military team.
- 147A. Advanced Coast Artillery (AA) (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military teaching methods; psychological warfare; military mobilization and demobilization; characteristics of matériel; gunnery; fire control and orientation; troop movements; new developments.
- 147B. Advanced Coast Artillery (AA) (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Geographical foundation of national power; command and staff; supply and maintenance; antiaircraft artillery tactics.

- 156A. Advanced Ordnance (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology and personnel management; military law and boards; organization of department; place of ordnance in the military team; maintenance and supply procedures; small arms matériel.
- 156B. Advanced Ordnance (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command, military problems of the United States; artillery matériel; ammunition; automotive matériel; fire control matériel.
- 157A. Advanced Ordnance (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, exercise of command; military teaching methods; psychological warfare; military mobilization; maintenance and supply procedure; artillery matériel; ammunition; automotive and fire control matériel.
- 157B. Advanced Ordnance (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Geographical foundation of national power; command and staff; small arms matériel; matériel specialty.
- 166A. Advanced Quartermaster Corps (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology and personnel management; military law and boards; administration of civilian personnel; classification of supplies; use of stock catalogues and bases of allowances; organization and function of the Quartermaster Corps; organization for supply in the army; property accountability and responsibility; the military team.
- 166B. Advanced Quartermaster Corps (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; Depot Supply I, Station Supply I, unit and organization supply.
- 167A. Advanced Quartermaster Corps (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Military teaching methods; psychological warfare; leadership, drill and exercise of command; military mobilization and demobilization; fiscal procedures; procurement procedures; Station Supply II, quartermaster inspection service.

- 167B. Advanced Quartermaster Corps (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Command and staff; geographical foundation of national power; Depot Supply II; storage; warehousing and matériels handling.
- 176A. Advanced Transportation Corps (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology, and personnel management; military law and boards; organization and function of the transportation corps; transportation services; transportation control; military passenger movements; military motor transport; stevedore operations.
- 176B. Advanced Transportation Corps (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; military freight movements; ports; zone of interior; amphibian trucks, harbor craft; transportation services; theater of operations; place of transportation corps in military team.
- 177A. Advanced Transportation Corps (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Military teaching methods; psychological warfare; leadership, drill and exercise of command; military mobilization and demobilization; transportation law; shop operations; movement control; theater of operations.
- 177B. Advanced Transportation Corps (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Command and staff; geographical foundation of national power; ports; zone of interior, theater of operations; transportation services, theater of operations.
- 186A. Advanced Corps of Military Police (First Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
For selected students who have successfully completed the basic course or its equivalent.  
Military leadership; psychology, and personnel management; military law and boards; military police functions; train and town patrolling; police science; the military team.
- 186B. Advanced Corps of Military Police (First Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.  
Leadership, drill, and exercise of command; military problems of the United States; communications; traffic control; mapping and sketching; prisoners of war.

187A. Advanced Corps of Military Police (Second Year). (3) I. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.

Military teaching methods; psychological warfare; leadership, drill, and exercise of command; military mobilization and demobilization; traffic control; military law; train and town patrol.

187B. Advanced Corps of Military Police (Second Year). (3) II. The STAFF  
Four hours of classwork and one hour of leadership, drill, and exercise of command a week.

Command and staff; geographical foundation of national power; general and special investigative techniques; orientation in military government; domestic disturbances; theater problems of military police.

## MUSIC

ERNEST BLOCH, Professor of Music (Summer Sessions only).

MANFRED F. BUKOFZER, Ph.D., 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.

CHARLES C. CUSHING, M.A., Associate Professor of Music.

EDWARD B. LAWTON, JR., A.B., Associate Professor of Music.

JOAQUIN NIN-CULMELL (Associate Professor of Music, Williams College),  
Visiting Associate Professor of Music.

DAVID D. BOYDEN, M.A., Assistant Professor of Music.

WILLIAM D. DENNY, M.A., Assistant Professor of Music.

WINFRED B. HOWE, M.A., Assistant Professor of Music.

\* ANDREW W. IMBRIE, M.A., Instructor in Music.

FRANKLIN CARTER, Associate in Music.

MARY GROOM JONES, Associate in Music.

ERNEST KUBITSCHKEK, Associate in Music.

HERMAN C. TRUTNER, III, Associate in Music.

\* 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.

WILLIAM E. KNUTH, M.A., Ed.D., Lecturer in Music.

REGINALD KRIEGER, A.B., Lecturer in Music.

EDGAR H. SPARKS, M.A., Lecturer in Music.

MARJORIE GEAR PETRAY, A.B., 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 (formerly 15), 125, and 155 will be accepted as Letters and Science credit. For regulations governing this list, see page 83.

*Departmental Major Advisers:* Mr. CUSHING, Mr. DENNY.

*Preparation for the Major.*—Required: Music A, B, C, 1, 2, 4A-4B, 30A-30B. Students who plan to specialize in music should confer with Miss Howe or Mr. Lawton at the beginning of the freshman year, in order to insure the fulfillment of the departmental prerequisites for the lower division. Specialization presupposes ability in piano playing. Instruction in piano, organ, violin, and voice is offered by University Extension.

\* Absent on leave, 1948-1949.

\* In residence spring semester only, 1948-1949.

The Griller Quartet will be available 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 technic. 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, 104, 105A, 105B, 106, either 107A or 107B, 108.

II. *History and Literature.*—At least two of the following courses: 116, 117, 118, 119, either 120A or 120B.

III. *Performance.*—At least two of the following courses: 125, 135, 155, 165, 175. Each of these courses may be repeated once without duplication of credit.

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. See also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION. The teaching major differs from that of the undergraduate major in music both in the prescribed courses and in the requirement of an average of 1.5 grade points per unit in music courses. Attention is directed to courses 300A–300B, 328, 329A, 329B, and 329C; teacher-training students are urged to undertake this work before attaining graduate status.

*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. SPARKS in charge  
Elements of music, with ear training and sight singing.
- B. Musicianship. (2) II. Mr. SPARKS in charge  
A continuation of course A, which is prerequisite.



- C. Musicianship. (2) I. Miss HOWE  
 A continuation of course B, which is prerequisite.
1. Elementary Counterpoint. (3) I. Mr. BUKOFZER, Mr. DENNY, Mr. SPARKS,  
 Mr. ABRAHAM, Mr. NIN-CULMELL  
 Prerequisite: course A, completed or taken concurrently.  
 Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.
2. Elementary Harmony. (3) II.  
 Mr. BUKOFZER, Miss HOWE, Mr. LAWTON, Mr. SESSIONS, Mr. ABRAHAM  
 Prerequisite: course 1; course B, completed or taken concurrently.
- 4A-4B. Intermediate Harmony. (3-3) Yr. Mr. NIN-CULMELL, Miss HOWE  
 Prerequisite: course 2.

*History and Literature*

- 27A-27B. Introduction to Musial Literature. (3-3) Yr. Mr. ELKUS  
 Two lectures and one section meeting weekly.  
 Course 27A is not prerequisite to 27B.  
 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.  
 NOTE.—See course 125.
35. University Chorus. (2) I and II. Mr. LAWTON  
 Two hour-and-a-half rehearsals and one weekly section hour.  
 NOTE.—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.  
 NOTE.—See course 155.

65. Chamber Music Ensemble. (1) I and II.

Mr. BOYDEN, THE GRILLER QUARTET (Mr. GRILLER in charge)

I: Mr. Boyden.

II: The Griller Quartet.

Two class hours weekly.

Open to any student of sufficient technical ability to take part in ensemble combinations for strings, wind instruments, piano.

NOTE.—See course 165.

75. University Symphony Orchestra. (2) I and II.

Mr. DENNY

Two two-hour rehearsals weekly.

Open to any student in the University whose technical proficiency meets the requirements of concert performance.

NOTE.—See course 175.

UPPER DIVISION COURSES

*Theory*

NOTE.—Students should take courses 100A and 100B in the junior year.

100A. Score-reading. (2) I.

Miss HOWE, Mr. SPARKS

Prerequisite: course 4A-4B.

100B. Keyboard Harmony. (2) II.

Miss HOWE, 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. STRICKLEN

Prerequisite: course 1.

102. Advanced Harmony. (3) II.

Mr. STRICKLEN

Prerequisite: course 4A-4B.

104. Polyphonic Composition. (2) I.

Mr. STRICKLEN

Prerequisite: course 101.

Polyphonic instrumental composition, exclusive of the fugue.

105A-105B. Principles of Composition. (3-3) Yr.

Mr. CUSHING

Prerequisite: courses 101 and 102.

106. Canon and Fugue. (2) II.

Mr. STRICKLEN

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.

Prerequisite: course 107A-107B.

Mr. SESSIONS

A review of contemporary musical materials with special emphasis on large design.

108. Instrumentation. (3) I.

Mr. DENNY

Prerequisite: course 4A-4B; 100A completed or taken concurrently.

A study of the instruments of the orchestra, leading to practice in scoring for instrumental combinations, including the orchestra.

Teacher-training students are advised to take this course in their junior year.

*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 and II.  
Mr. BOYDEN, THE GRILLER QUARTET (Mr. GRILLER in charge)  
I: Mr. Boyden. II: The Griller Quartet.  
Two class hours weekly.
175. Advanced University Symphony Orchestra. (2) I and II. Mr. DENNY  
Two two-hour rehearsals weekly.  
Prerequisite: completion of 4 units in course 75.

*History and Literature*

Courses in this group will be given in rotation: baroque, classic, romantic, modern. Prerequisite: course 30A-30B and consent of the instructor.

*Baroque Period*

- 116A. Survey of Musical Literature, 1600-1750. (3) I. 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) I. Mr. BUKOFZER  
The music of the early classic schools and of Haydn, Mozart, and Beethoven.

\* Not to be given, 1948-1949.

- \*117B. The Operas of Mozart. (3) II. Mr. BUKOFZER  
 \*117C. The String Quartets of Beethoven. (3) II. Mr. ELKUS

*Romantic Period*

- 118A. Survey of the Period from Weber and Schubert to the Beginning of Impressionism. (3) I. Mr. NIN-CULMELL  
 \*118B. The Operas of Verdi. (3) II. Mr. BUKOFZER  
 118C. The Operas of Wagner. (3) II. Mr. ELKUS

*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 from 1920 to the Present. (3) I. Mr. SESSIONS

*Forms and Mediums*

## Choral Literature.

In special cases any student of at least junior standing may take course 120A or 120B with the permission of the instructor.

- \*120A. Josquin des Prez to Handel. (3) I. Mr. LAWTON  
 \*120B. Bach to the Present Day. (3) II. Mr. LAWTON

*National Schools*

130. The Music of Spain. (3) II. Mr. NIN-CULMELL  
 From the Middle Ages to the present.

*Special Study Course*

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 156.

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

\* Not to be given, 1948-1949.

- \*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.
- 210A-210B. Seminar in Early Music. (3-3) Yr. Mr. LAWTON
211. Seminar: Studies in Musical Research. (3) II. Mr. BOYDEN  
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) II. Mr. BUKOFZER  
Reading and interpretation of theorists from the 16th century to the present.
215. Seminar: The History of Dissonance Treatment. (3) I. Mr. BUKOFZER
221. Seminar: Studies in Classic and Romantic Music. (3) I. Mr. ELKUS  
A study of the works of Chopin.
- \*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. Mr. BUKOFZER  
For prospective doctoral candidates.
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

\* Not to be given, 1948-1949.

† See ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

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.

PROFESSIONAL COURSES

409. Band Instrumentation. (2) II. Mr. DENNY

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, completed or 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. These courses will be accepted as elective credit toward the teaching major or minor in music.

\*445B. Oboe. ( $\frac{1}{2}$ ) I and II. \_\_\_\_\_

445D. Bassoon. ( $\frac{1}{2}$ ) I and II.

Mr. KUBITSCHER

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. \_\_\_\_\_

\* Not to be given, 1948-1949.

## NAVAL SCIENCE

HARRY W. NEED, 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.

JOHN D. P. HODAPP, JR., Lieutenant Commander, U.S.N.; Associate Professor of Naval Science.

ERWIN N. THODE, Lieutenant Commander, Supply Corps, U.S.N.; Associate Professor of Naval Science.

AUSTIN N. SPEER, Lieutenant Commander, AVH, U.S.N.; Associate Professor of Naval Science.

MORTON T. SWARTH, Lieutenant, U.S.N.; Assistant Professor of Naval Science.

RICHARD J. MORRISSEY, Captain, U.S.M.C.; 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 83.

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 57, 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.

NOTE.—All students enrolled in the Naval Reserve Officers' Training Corps are required to engage in drill or practical exercises two hours weekly.

## LOWER DIVISION COURSES

- 1A. Introduction to Naval Science. (3) I. The STAFF  
Orientation; basic naval administration; naval justice; naval customs; basic seamanship.
- 1B. Communication and Tactics. (3) II. The STAFF  
Communication systems, procedures and equipment; naval correspondence; basic tactics and operations; fleet and task force organization; anti-submarine and antimine warfare, amphibious warfare; ship handling; daily routines; elementary maneuvering board problems.
- 2A. Ordnance and Fire Control. (3) I. Mr. SWARTH  
Ammunition components, gun assemblies, major and intermediate caliber installations, machine guns, torpedoes, mines, depth charges, rockets, nuclear explosives, surface fire control.
- 2B. Fire Control and Applied Naval Electronics. (3) II. Mr. SWARTH  
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. Piloting and Navigation. (3) I. Mr. SPEER  
 Piloting; celestial navigation; aerial navigation; elementary astronomy; charts and instruments.
- 101B. Advanced Navigation and Tactics. (3) II. Mr. SPEER  
 Prerequisite: course 101A.  
 Navigational day's work; advanced maneuvering board problems; escort tactics; fleet and task force tactics.
- 102A. Naval Engineering. (3) I. Mr. HODAPP  
 Naval boilers and auxiliaries; naval steam turbines; naval Diesel engines; aircraft engines.
- 102B. Ship Construction and Stability. (3) II. Mr. HODAPP  
 Construction of naval vessels; compartmentation; damage control methods; stability; fire and gas protection methods.
- 106s. Navy Supply. (3) I. Mr. THODE  
 Description of U.S. Navy Supply Corps Organization and activities, Navy accounting systems, material handling and procurement procedures, account and material classifications.
- 107s. Naval Supply. (3) II. Mr. THODE  
 Supply department functions, procurement and purchases, issues, stores returns accounting, appropriation and cost reports, commissary and ship's store procedures, transfers and material disposition.  
 NOTE.—Candidates for commissions in the Marine Corps will be required to complete courses 1A, 1B, 2A, 2B, and 101A. In place of courses 101B, 102A, and 102B, they may be allowed to take courses in the following Marine Corps subjects.
- 103M. U.S. Military History, Principles of War, and Basic Military Training. (3) I. Mr. MORRISEY  
 Brief historical study of Marine Corps; chronological study of U.S. military history, stressing correct and incorrect application of tactics; review of basic infantry weapons and map reading.
- 104M. Tactics and Techniques of a Marine Rifle Company. (3) II. Mr. MORRISEY  
 Machine gun platoon and rifle company tactics; mortar section tactics; special operations, combat intelligence; logistics.



## 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 83.

*Departmental Major Adviser:* Mr. LUTZ.

*Preparation for the Major.*—Course 13A-13B; 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 13B may be taken without 13A.

25A-25B. History of the Mohammedan Civilization. (2-2) Yr. Mr. FISCHER  
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 Near Eastern 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. FISCHER  
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 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. FISCHER

121A-121B. Intermediate Hebrew. (2-2) Yr. Mr. FISCHER  
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. Prerequisite: course 151A-151B.	Mr. LUTZ
161A-161B. Elementary Egyptian. (3-3) Yr. Prerequisite: course 21A-21B or 6 units of Greek.	Mr. LUTZ
171A-171B. Elementary Coptic. (2-2) Yr. Prerequisite: course 21A-21B or 6 units of Greek.	Mr. LUTZ
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 156.

224A-224B. Advanced Biblical Hebrew. (2-2) Yr. One or more of the prophetic and poetical books, with special attention to literary form.	Mr. FISCHEL
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. In alternate year: (A) The Koran. (B) 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. (2-2) Yr.	Mr. LUTZ, Mr. FISCHEL
*290A-290B. Special Study. Credit according to work accomplished.	Mr. LUTZ, Mr. FISCHEL

\* Not to be given, 1948-1949.

† To be given if a sufficient number of students enroll.

## NURSING

PEARL CASTILE, R.N., M.A., Assistant Professor of Nursing.

JEANNETTE S. HILLER, R.N., B.A., B.N., M.A., P.H.N., Assistant Professor of Nursing.

<sup>1</sup> ALICE E. INGMIRE, R.N., B.S., 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.

MARY T. HARMS, R.N., B.S., Instructor in Nursing.

ANN HILL, J.D., R.N., B.S., P.H.N., Instructor in Public Health 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.

KATHERYN M. SMITH, R.N., B.S., Instructor in Nursing.

DOROTHY R. BEST, R.N., B.S., Lecturer in Nursing.

MARY KING VICKERY, R.N., B.S., Lecturer in Nursing.

OLIVE WALKLEY, R.N., A.B., B.N., Lecturer in Psychiatric Nursing.

**Members of Other Departments Giving Instruction  
in the Department of Nursing**

PETER COHEN, B.S., M.D., Lecturer in Pediatrics.

CARL H. JONAS, M.D., Clinical Instructor in Psychiatry.

JOHN B. LAGEN, M.D., Assistant Professor of Medicine.

ALLAN PALMER, M.D., Assistant Professor of Obstetrics and Gynecology.

ALEX C. SHERRIFFS, Ph.D., Assistant Professor of Psychology.

HENRY L. SILVANI, A.B., M.D., Assistant Clinical Professor of Surgery.

HENRY K. SILVER, M.D., Instructor in Pediatrics.

WILLIAM W. STILES, B.S., M.D., Associate Professor of Public Health.

FRANCES A. TORREY, A.B., M.D., Assistant Clinical Professor of Dermatology.

*(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.<br>A study of public health nursing functions and activities.                       | Miss MACOWAN |
| 419. The Field of Public Health Nursing. (3) I and II.<br>Consideration of the essentials of a good public health nursing service. | Miss MACOWAN |

<sup>1</sup> In residence fall semester only, 1948-1949.

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.
- †431. Administration in Schools of Nursing. (2) I. Miss TRACY  
 Prerequisite: courses 432, 434, Education 110, and consent of the instructor.
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 CASTLE  
 Prerequisite: course 432, Education 110, or consent of the instructor.  
 Required of all candidates for the Certificate in Nursing Education.

(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.
- 416A. Health Teaching. (1) I and II. Mrs. HILLER
417. Social Problems of Nursing Service. (2) I. Mrs. HILLER
418. The Nurse in Public Health. (3) I. 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. \_\_\_\_\_
- 427A-427B. Pharmacology and Therapeutics. (2-1) Yr. Miss BINHAMMER, Mr. LAGEN
432. Principles of Nursing Education. (2) II. Miss TRACY, Miss NEWTON

† To be given if a sufficient number of students enroll.

435. Introduction to Nursing Arts. (5) I. Mrs. INGMIRE, ———
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. ———
- 444E. Pediatric and Communicable Disease Nursing. (2) I and II. Miss SMITH
- 444F. Pediatrics 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. ———  
Parallels Education 110 given at Berkeley.

## HOME ECONOMICS

103. Elementary Nutrition. (3) I. Miss MORSE  
Parallels Home Economics 103 given at Berkeley.
104. Diet Therapy. (3) II. Miss MORSE  
Prerequisite: Home Economics 103.

## PSYCHOLOGY

112. Child Psychology. (2) II. Mr. SHERRIFFS  
Parallels Psychology 112 given at Berkeley.

## PUBLIC HEALTH

121. Child Hygiene. (2) I and II. Mr. COHEN  
Parallels Public Health 121 given at Berkeley.
145. Community Control of the Communicable Diseases. (3) II. Mr. STILES  
Parallels Public Health 145 given at Berkeley.

## SOCIAL WELFARE

100. The Field of Social Welfare. (3) I and II. ———  
Parallels Social Welfare 100 given at Berkeley.

## 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.  
 GORDON L. WALLS, Sc.D., Associate Professor of Physiological Optics and Optometry.  
 MEREDITH W. MORGAN, JR., Ph.D., Assistant Professor of Optometry.  
 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.  
 FERT 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.  
 ARTHUR LAYTON, M.A., 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.

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 1A, 1C or Zoölogy 1A, Anatomy 102, Psychology 1A, 2, 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

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, iseikonic 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, 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, and neutralization of lenses; 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, orthoptic training, the professional practice of optometry.
- 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.  
Lectures dealing with the identification of pathological conditions in the eye, and the manifestation of organic disease as indicated by the eye.
412. Special Clinical Procedures. (2) II. Mr. MORGAN  
Prerequisite: courses 401A-401B, 102A-102B, 103A, 404A, 406A.  
Lectures and laboratory assignments in subnormal vision, telescopic spectacles, contact lens fitting, and allied subjects.
499. Special Study for Advanced Undergraduates. (1-4) I and II.  
The STAFF (Mr. STODDARD in charge)

## 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 neurology, 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 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 courses 105A-105B.
- \*109. Physiological Optics. (2) II. Mr. STODDARD  
Lectures on the physics, physiology, and psychology of vision for students in electrical engineering whose option is illumination engineering.

\* Not to be given, 1948-1949.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

\*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

General Human Anatomy. (Anatomy 102.)

Anatomy and Physiology of the Eye. (Physiology 115.)

Mammalian Physiology. (Physiology 110A-110B.)

Geometrical and Physical Optics. (Physics 108A-108B.)

\* Not to be given, 1948-1949.



## ORIENTAL LANGUAGES

PETER A. BOODBERG, Ph.D., Professor of Oriental Languages (Chairman of the Department).

YUEN REN CHAO, Ph.D., Litt.D., Professor of Oriental Languages and Linguistics.

FERDINAND D. LESSING, Ph.D., Agassiz Professor of Oriental Languages.

SHIH-HSIANG CHEN, B.Litt., Assistant Professor of Chinese.

MARY R. HAAS, Ph.D., Assistant Professor of Siamese and Linguistics.

EDWARD H. SCHAFER, Ph.D., Assistant Professor of Oriental Languages.

DENZEL CARR, Ph.D., Lecturer in 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 for the spring semester.

*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 83.

*Departmental Major Adviser:* Mr. SCHAFER.

*Preparation for the Major.*—

- Required: (a) Emphasis on Chinese—  
 Freshman year: 12A–12B, 13, 17.  
 Sophomore year: 23A–23B.  
 (b) Emphasis on Japanese—  
 Freshman year: 9A–9B (or 29A–29B), 13, 17.  
 Sophomore year: 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 29A–29B instead of 9A–9B must, in addition to 14 lower division units, take 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: 119A–119B, 129A–129B, 139.  
 (b) Courses 137, 147, 198.  
 (c) 4 units selected from courses 100A–100B, 113, 117, 133A–133B, 193.  
 (d) 4 units selected from other upper division language or lecture courses in the department.

\* In residence spring semester only, 1948–1949.

- (2) With emphasis on Oriental linguistics:  
 (a) Courses 100A-100B, 117, 123 or 139, 135, 177, 197A-197B, 198; 167 or Classics 194.  
 (b) 4 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 Ph.D. degree in Oriental languages must take 117, 133A-133B, and 193 in their senior year.

Students who fail to maintain an average of one grade point 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  
 (Formerly numbered 1A-1B.)
13. Classical Chinese. (2) I. Mr. BOODBERG, Mr. MILLER, Mr. SCHAFER  
 To be taken concurrently with 12A, 9A, or 29A.
17. Introduction to the Study of Chinese Characters and Sino-Japanese.  
 (2) II. Mr. BOODBERG, Mr. MILLER, Mr. NAKAMURA  
 To be taken concurrently with 12B, 9B, or 29B.
- 23A-23B. Intermediate Chinese. (3-3) Yr. Mr. CHEN, Mr. SCHAFER  
 (Formerly numbered 101A-101B).  
 Prerequisite: course 12A-12B.
- 29A-29B. Japanese Oral and Written Composition. (2-2) Yr. Mr. NAKAMURA
- 39A-39B. Intermediate Japanese. (3-3) Yr. Mr. NAKAMURA  
 (Formerly numbered 109A-109B).  
 Prerequisite: course 9A-9B.

LECTURE COURSES

32. Evolution of Japanese Civilization before 1868. (2) I. Mr. CARR
- \*42. Chinese Civilization in the Asiatic Context. (2) Mr. BOODBERG

UPPER DIVISION COURSES

- 100A-100B. Languages of Eastern Asia. (1-1) Yr.  
 Mr. BOODBERG and the STAFF  
 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

\* Not to be given, 1948-1949.

117. Logography and the Evolution of the Chinese Language and Script.  
(2) II. 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 and to Kambun. (2-2) Yr.  
Mr. CARR
- 133A-133B. Chinese Bibliography. (2-2) Yr. Miss HUFF  
Open to seniors.  
Some attention will be given to Japanese Sinological sources.
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. Ten laboratory hours weekly.
139. Japanese Grammar. (2) II. Mr. CARR
147. Elements of Chinese and Japanese Culture. (1) II.  
Prerequisite: course 137. Mr. CHEN, Mr. NAKAMURA  
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 for Students of Oriental Languages. (2) I. Mrs. HAAS
- \*173A-173B. Chinese Philosophical Texts. (2-2) Yr. ———
- 174A-174B. Siamese (Thai). (2-2) Yr. Mrs. HAAS
177. Types of Linguistic Structure. (2) II. Mrs. 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.
193. Language and Culture in East Asia: Readings in Sinological Literature.  
(2) I. Mr. SCHAFER

\* Not to be given, 1948-1949.

† To be given if a sufficient number of students enroll.

- 197A-197B. Linguistics Laboratory. (3-2) Yr. Mrs. 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. The phonetic and analytic skills needed will be developed in class. Open to qualified language students and students of anthropology who have had course 167 or Classics 194.
198. Special Study for Advanced Undergraduates and the Senior Essay. (1-2) I and II. Mr. CARR, Mr. CHEN, Mr. SCHAFER  
 Required of all majors in Oriental languages.  
 I. Mr. Schafer, Mr. Carr.  
 II. Mr. Chen, Mr. Carr.
- \*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.
142. Civilizations of Eastern Asia. (2) II. Mr. SCHAFER
152. Marco Polo's Asia. (2) II. Mr. OLSCHKI
- \*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) I. Mr. BOODBERG
- \*188. Philological Method: Languages and Literatures of Eastern Asia. (1) Mr. SCHAFER

GRADUATE COURSES

- 201A-201B. Buddhist Texts. (2-2) Yr. Mr. LESSING
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
214. Tenth and Eleventh Century Texts: Sources for the Civilization of the Five Dynasties Period. (2) II. Mr. SCHAFER
235. Seminar in Chinese Dialectology. (2) II. Mr. CHAO
- 239A-239B. Seminar in Japanese. (2-2) Yr. Mr. CARR
250. Research. (1-4) I and II. The STAFF

\* Not to be given, 1948-1949.

## PALEONTOLOGY

CHARLES L. CAMP, Ph.D., Professor of Paleontology, Director of the Museum Curator of Reptiles and Amphibians 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 (Acting Chairman of the Department) and Curator of Invertebrate Collections in the Museum of Paleontology.

ROBERT M. KLEINPELL, Ph.D., Associate Professor of Paleontology and Curator of Micropaleontological Collections in the Museum of Paleontology.

RUBEN A. STIRTON, Ph.D., Associate Professor of Paleontology and Curator of Mammals 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 83.

*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, 2, 3; Botany 1 or Zoölogy 1A-1B; Geology 1A-1B; matriculation chemistry or physics. For the majors emphasizing geology, Mineralogy 4A is also required.

Recommended: Chemistry 1A-1B; Botany 16 (3) for II (c) (see below); Anthropology 152 for I (b) and II (b); French and German. 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 102A-102B (4-4), 103 (5), 104 (4), 105 (4) or 109 (5); Geology 102A-102B (2-2), 103 (3), 116 (2), 107 (2) or 117 (3), and Engineering 1A-1B (3-3). Recommended: Zoölogy 112 (4).

(b) Emphasis on vertebrate paleontology: courses 113 (3), 114 (3), 115 (3); Geology 102A-102B (2-2), 103 (3); Zoölogy 113 (4) or 106 (4), 114 (3) or Genetics 103 (3).

(c) Emphasis on paleobotany: courses 120 (3), and 121 (3); Botany 110A-110B (6); Geology 102A-102B (2-2), 103 (3); and at least 4 units chosen from courses 102A-102B (4-4), 114 (3), 115 (3).

II. Paleontology and Biological Sciences.

(a) Emphasis on invertebrate paleontology: courses 102A-102B (4-4), 103 (5), 104 (4), 105 (4) or 109 (5); Zoölogy 112 (4), 114 (3); and at least 8 units chosen from courses 113 (3), 114 (3), 115 (3), 120 (3); Genetics 103 (3), and Zoölogy 110 (4).

(b) Emphasis on vertebrate paleontology: courses 113 (3), 114 (3), 115 (3); Zoölogy 106 (4), 113 (4), 114 (3) or Genetics 103 (3); and at least 4 units chosen from courses 102A-102B (4-4), 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 102A-102B (4-4), 103 (5), 114 (3), 115 (3).

*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. STURTON  
 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.
10. General Paleontology. (3) I. Mr. CHANEY  
 (Formerly numbered 1.)  
 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.
2. Introductory Invertebrate Paleontology. (3) I. Mr. KLEINPELL  
 Two lectures and laboratory.  
 Prerequisite: course 1 or Geology 1B.  
 Principles of invertebrate paleobiology and systematics.
3. Introductory Vertebrate Paleontology. (3) II. Mr. CAMP  
 Two lectures and laboratory.  
 Prerequisite: course 1, or Zoölogy 1A, or Geology 1B, or Anthropology 1.  
 Enrollment limited to twenty.  
 The vertebrate skeleton, vertebrate evolution, principles of paleontology.

## UPPER DIVISION COURSES

- 102A-102B. Invertebrate Paleontology. (4-4) Yr. Mr. DURHAM  
 Two lectures and laboratory.  
 Prerequisite: course 1, or Geology 1A-1B, or Zoölogy 1A, and consent of the instructor.  
 Systematic morphology and phylogeny of the fossil invertebrates.
103. Invertebrate Paleontology and Stratigraphy of the Late Mesozoic and Tertiary of North America. (5) I. Mr. DURHAM  
 Three lectures and laboratory. Seven all-day field trips.  
 Prerequisite: course 102A-102B.
104. Stratigraphic Paleontology. (4) I. Mr. KLEINPELL  
 Two lectures and laboratory.  
 Prerequisite: Geology 1B and course 1; or Zoölogy 1A, and course 2 or 102 (concurrently).  
 Principles of biostratigraphy and correlation.

105. Micropaleontology (4) II. Mr. KLEINPELL  
Prerequisite: course 104.
109. Cenozoic History of the West Coast of North America. (5) II.  
Three lectures and laboratory; assigned readings. Mr. KLEINPELL  
Prerequisite: course 103 or 105.
113. Advanced Vertebrate Paleontology. (3) I. Mr. CAMP  
Lectures, proseminar, and laboratory.  
Prerequisite: course 3 or Zoölogy 106.
114. Evolution and Classification of Fossil Mammals. (3) I. Mr. STIRTON  
Lectures, proseminar, and laboratory.  
Prerequisite: course 3 or Zoölogy 106.
115. History and Paleoecology of Vertebrate Life of the Cenozoic. (3) II.  
Lectures, proseminar, and laboratory. Mr. STIRTON  
Prerequisite: course 114.
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.
199. Special Study for Advanced Undergraduates. (1-5) I and II or in field  
during the summer. The STAFF (Mr. DURHAM in charge)

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

203. Seminar in Micropaleontology. (2) I. Mr. KLEINPELL
204. Seminar in Mammalian Paleontology. (2) I. Mr. STIRTON
205. Seminar in Vertebrate Paleontology. (2) I and II. Mr. CAMP
206. Seminar in Invertebrate Paleontology. (2) I and II. Mr. DURHAM  
Current literature and general problems.
207. Seminar in Paleobotany. (2) I and II. Mr. CHANEY  
Current literature and general problems.
208. Research in Paleontology. I and II. The STAFF (Mr. DURHAM in charge)  
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 fossil collections on the Pacific Coast, and makes use of these in teaching and research. The Matthew Library of Paleontology is housed on the premises, and is open to students. Anyone interested in employing the facilities of the Museum may address the Director.

## PHILOSOPHY

<sup>2</sup> 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.

<sup>1</sup> 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., Instructor in Philosophy.

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HIRAM J. MCLENDON, M.A., Lecturer in 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 83.

*Departmental Major Adviser:* Mr. ASCHENBRENNER.

*Preparation for the Major.*—Courses 10A-10B 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

NOTE.—Course 6A is prerequisite to 6B. Three sections in 6A will be given in the second semester and three sections of 6B in the first semester.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.



- 6A-6B. Introduction to Philosophy. (3-3) Yr. Beginning each semester.  
 Mr. ADAMS, Mr. ASCHENBRENNER, Mr. DENNES, Mr. LOWENBERG,  
 Mr. MACKAY, Mr. MCLENDON, Mr. MATES, Mr. PEPPER, Mr. STRONG  
 Weekly section meetings for discussion and written work.

## SOPHOMORE COURSES

- 10A-10B. History of Philosophy. (3-3) Yr. Mr. DENNES, Mr. MACKAY  
 I. From the Pre-Socratics to Plotinius.  
 II. From the Scholastics to the Utilitarians.
- 12A-12B. Logic. (3-3) Yr. Mr. MARHENKE, Mr. MATES
14. Scientific Method. (3) II. Mr. MARHENKE

## UPPER DIVISION COURSES

*General Prerequisites.*—Students enrolling in any upper division course must have completed 6 units in courses 6A-6B or 10A-10B.

## 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.
- 136A-136B. Aesthetics. (3-3) Yr. Mr. PEPPER, Mr. ASCHENBRENNER  
 A study of general aesthetic principles followed by their applications to music, the visual arts, and literature. 136A is prerequisite to 136B.
- \*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.
- NOTE.—At the discretion of the instructor in Philosophy 136A, 136B, or 136C, the general prerequisites may be waived for major students in literature or in the fine arts. Philosophy 136C together with either 136A or 136B will be counted as a year course of 6 units in aesthetics. 136C may be taken in addition to both 136A and 136B without loss of credit.
146. Philosophy in Literature. (3) II. Mr. LOEWENBERG  
 NOTE.—At the discretion of the instructor the general prerequisites may be waived for major students in literature or in the fine arts.

\* Not to be given, 1948-1949.

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) II. Mr. McLENDON
- \*122. Philosophy of Mind. (3) I. Mr. McLENDON
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 students.  
A study of various conceptions of value with a special emphasis on purposive activity, and its relation to social organization.
- 135A-135B. Contemporary Tendencies in Philosophy. (3-3) Yr. Mr. McLENDON
147. Theory of Historical Inquiry. (3) I. Mr. STRONG

GROUP C

Courses dealing with individual thinkers and epochs in the history of ideas. Philosophy 10A-10B or its equivalent is prerequisite to courses in this group.

103. Philosophy of the Nineteenth Century. (3) I. Mr. MACKAY
- \*105. Kant. (3) II. Mr. LOEWENBERG
115. Medieval and Early-Modern Thought. (3) II. Mr. STRONG
116. Plato. (3) II. Mr. MACKAY
- \*117. Aristotle. (3) II. \_\_\_\_\_
- \*118. Spinoza. (3) I. Mr. DENNES
119. British Empiricism with Special Reference to Hume. (3) II. Mr. ASCHENBRENNER
- \*121. Hobbes. (3) II. \_\_\_\_\_
126. Hellenistic Philosophy: The Stoics, Epicureans, and Skeptics. (3) I. Mr. MATES
129. Leibniz. (3) I. Mr. MARHENKE

\* Not to be given, 1948-1949.

- \*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 156.

204. Seminar in Ethics. (2) II. 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) II. Mr. MACKAY
- 222A-222B. Seminar on Recent Empiricism. (2-2) Yr. Mr. MCLENDON
- \*225. Seminar: Theory of Value. Mr. DENNES
- \*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.

\* Not to be given, 1948-1949.

## 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.

ANNA ESPENSCHADE, Ph.D., Associate Professor of Physical Education.

SARAH R. DAVIS, A.B., Assistant Professor of Physical Education, Emeritus.

FRANKLIN M. HENRY, Ph.D., Associate Professor of Physical Education.

\*LOUISE S. COBB, Ph.D., Associate Supervisor of Physical Education.

<sup>2</sup>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 BERNHARD, M.S., Assistant Supervisor of Physical Education.

CAROLINE W. COLEMAN, 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.

HELEN M. DARROW, M.A., Junior Supervisor of Physical Education.

LANCE FLANAGAN, A.B., Junior Supervisor of Physical Education.

KATHARINE GILCOYNE, B.S., Junior Supervisor of Physical Education.

MARIAN A. WATSON, M.A., Junior Supervisor of Physical Education.

JOAN E. FARRELL, M.S., 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 gymnasias, 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 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.

† Miss Hodgson will serve as executive officer in the Division for Women.

\* Absent on leave, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

*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. ( $\frac{1}{2}$ ) 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. ( $\frac{1}{2}$ ) 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 5A, 26, and 35 at Hearst Gymnasium during the first week of the semester.

##### 5A. First Aid. (1) I and II.

The STAFF

(Formerly numbered 33.)

Standard course. Sections meet two hours weekly.

Upon successful completion of the course, the Red Cross Certificate is awarded.

† See Lower Division Courses for Men and Women.

- \*5B. Advanced First Aid. (No credit.) I and II. The STAFF  
(Formerly numbered 34.)  
Sections meet two hours weekly for eight weeks.  
Upon successful completion of the course, the Red Cross Certificate is awarded.
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.
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.
35. Rhythmic Basis of Dance and Allied Arts. (2) II. Miss CZARNOWSKI  
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.

## 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 5A, Physiology 1A 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 35 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. \_\_\_\_\_  
Lectures and laboratory.  
Recommended: course 101. Course 165A is not prerequisite to 165B.
166. Theory of Individual Athletics. (2) II.  
Mrs. GLASS, Miss COLEMAN, Miss BARTLETT  
(Formerly numbered 171.)  
Prerequisite: a working knowledge of the activities included.

## UPPER DIVISION COURSES FOR MEN AND WOMEN

101. Kinesiology and Body Mechanics. (4) I. Miss BARTLETT  
(Formerly numbered 151.)  
Lectures and laboratory.  
Prerequisite: Physiology 1A, 1C, and Anatomy 102.  
The study and application of physical structure and muscular movements 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.

\* Not to be given, 1948-1949.

102. Corrective Physical Education. (3) II. Miss BARTLETT  
 Prerequisite: course 101.  
 Development of programs for those individuals whom the physician has 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  
 (Formerly numbered 140.)  
 Lectures and laboratory.  
 Prerequisite: high school chemistry, Home Economics 10, Physiology 1A, 1C, 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. Mr. HENRY  
 (Formerly numbered 120.)  
 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. Mr. STONE  
 (Formerly numbered 175.)  
 Prerequisite: course 20, Physiology 1A-1C, 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. Miss ESPENSCHADE  
 (Formerly numbered 149.)  
 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. Mr. MILLER  
 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.
- NOTE.—Course 140 is not open to students who have taken courses 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. Mr. MILLER  
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) II.  
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. Mr. HEWITT  
One lecture and two laboratory hours to be arranged.  
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. Mr. NEWSOM  
One lecture and two laboratory hours to be arranged.
- †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 DARROW  
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. Lectures, demonstrations, and reading assignments.

## METHODS COURSE FOR WOMEN

360. The Teaching of Physical Education. (2) II. Miss HODGSON  
(Formerly numbered 300.)  
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. Mr. COZENS, Miss ESPENSCHADE, Miss HODGSON, Mr. HENRY  
(Formerly numbered 250A-250B.)  
NOTE.—Course 260B will also be offered in the fall semester and 260A in the spring semester.  
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  
(Formerly numbered 255.)
290. Research. (1-6) I and II. Mr. COZENS, Miss ESPENSCHADE, Mr. HENRY, Miss HODGSON  
(Formerly numbered 256.)

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† To be given if a sufficient number of students enroll.

## 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.  
 WILLIAM H. WILLIAMS, Graduate, United States Military Academy, Professor of Physics.  
 RALPH S. MINOR, Ph.D., Professor of Physics and Optometry, Emeritus.  
 HIRAM W. EDWARDS, Ph.D., Associate Professor of Physics.  
 AUGUST C. HELMHOLZ, Ph.D., Associate Professor of Physics.  
 WOLFGANG PANOFSKY, Ph.D., Associate Professor of Physics.  
 WILSON M. POWELL, Ph.D., Associate 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.  
 HOWARD A. WILCOX, Ph.D., Instructor in Physics.  
 HERSCHEL SNODGRASS, M.S., Associate in Physics.  
 MARY B. SUMMERFIELD, M.A., Associate in Physics.

- <sup>2</sup> 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 Director of the Crocker Laboratory.  
 JOHN H. LAWRENCE, M.D., Associate Professor of Medical Physics and Experimental Medicine and Director of the Donner Laboratory.  
 JOHN W. GOPMAN, M.D., Ph.D., Assistant Professor of Medical Physics.  
 HARDIN B. JONES, Ph.D., Assistant Professor of Medical Physics and Physiology.  
 CORNELIUS A. TOBIAS, Ph.D., Assistant Professor of Medical Physics.  
 R. LOWRY DOBSON, M.D., Instructor in Medical Physics.

<sup>2</sup> In residence spring semester only, 1948-1949.

*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 83.

*Departmental Major Adviser:* Mr. LOEB, Mr. WHITE.

*Preparation for the Major.*—Required: Physics 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 110.)

*Honors.*—No special courses are given for honor students. Such students may do special work in course 199.

#### 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, Mrs. SUMMERFIELD, Mr. WHITE, Mr. WILCOX

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. FRETTER, Mr. LENZEN, Mr. WILCOX

Three lectures and one three-hour laboratory period.

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.

Prerequisite: Mathematics 3A-3B or its equivalent. Mathematics 3B may be taken concurrently.

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) I. Mr. HELMHOLZ  
 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 or 2) I and II.  
 32B. Light, Electricity and Magnetism. (1 or 2) 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. 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 that portion of the former 1B covering Properties of Matter.
- 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 that portion of the former 1B covering Heat.

## 41D. Supplementary Lecture and Laboratory Course in General Physics. (3) II.

Mr. MOYER, Mr. POWELL

Students enrolled under 41D will attend the lectures and laboratory of 4C, but will be held only for the portion equivalent to the former 1D, namely, Wave Motion, Sound, and Light.

## 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. LEWIS, Mr. WILLIAMS

104A. I: Mr. Williams; II: Mr. Lewis.

104B. II: Mr. Williams.

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 invarientive formulation of physical laws.

## 105A-105B. Analytic Mechanics. (3-3) Yr. Mr. HELMHOLZ, Mr. MOYER

105A. I: Mr. Helmholtz; II: Mr. Moyer.

105B. 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. FRETTER, Mr. WILCOX

Lectures, I: Sec. 1, Mr. Alvarez; II: Sec. 1, Mr. Fretter; 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. Mr. BRODE, Mr. POWELL

110A. I: Mr. Powell; 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.

Mr. CHAMBERLAIN, Mr. PANOFKY, Mr. SNODGRASS

Prerequisite: course 121.

The use and calibration of precision electrical instruments and electronic devices.

## 110D. Modern Physics Laboratory. (1) I and II.

Mr. CHAMBERLAIN, Mr. PANOFKY, Mr. SNODGRASS

Prerequisite: course 121.

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. Thornton; II: Mr. Alvarez. Mr. ALVAREZ, Mr. THORNTON  
 Prerequisite: course 121.  
 Discovery of radioactivity, nature of radioactivity,  $\alpha$ ,  $\beta$ , and  $\gamma$  rays, theory of successive transformation, artificial transmutations, nuclear structure.
125. Introduction to Medical Physics. (1) I. Mr. JONES, Mr. JOHN LAWRENCE  
 Application of recent advances in nuclear physics to biological and medical problems.
126. Biological Applications of Artificial Radioactivity. (2) II. Mr. HAMILTON, Mr. TOBIAS  
 Prerequisite: Chemistry 1A-1B, course 2A-2B, and one of the following: Zoölogy 1A-1B, Physiology 1A-1C, 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. Mr. HAMILTON, Mr. TOBIAS  
 Laboratory work to accompany course 126.
127. Biophysics. (2) II. Mr. TOBIAS  
 Prerequisite: courses 4A, 4B, 4C; Chemistry 1A, 1B, 8; analytic geometry and calculus. Recommended: 12 units of biology and Physics 110A-110B, 112, 121, 125.  
 Application of modern physical concepts and experimental methods to the problems of large molecules and their biological functions.

## 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 156.

## 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. I: Mr. White; II: Mr. White.

Mr. JENKINS, Mr. WHITE

208B. II: Mr. Jenkins.

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.

Mr. HELMHOLTZ, Mr. PANOFSKY

210A. I: Mr. Panofsky; II: Mr. Helmholtz.

210B. 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. SEGRÈ, Mr. WILLIAMS

I: Mr. Segrè; II: Mr. Williams.

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) II. Mr. LENZEN, Mr. WILLIAMS  
 I: Mr. Williams; 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) II. 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. Methods of 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.
230. Electrodynamics. (3) II. Mr. SERBER  
 Prerequisite: course 210A-210B.  
 Electrodynamics, radiation, and relativity.
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 1948-1949 will probably include Seminar in Theoretical Physics (I and II, Lewis, Wick), Cosmic Rays (I and II, Brode), Discharge Through Gases (I and II, Loeb).
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.)

\* Not to be given, 1948-1949.



## PHYSIOLOGY

## A Division of the Medical School

I. LYON CHAIKOFF, M.D., Ph.D., Professor of Physiology.

SHERBURNE F. COOK, Ph.D., Professor of Physiology (Acting Chairman of the Division, Fall Semester) and Lecturer in Optometry.

<sup>2</sup> 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.

D. HAROLD COPP, M.D., Ph.D., Assistant Professor of Physiology.

CECIL ENTENMAN, Ph.D., Assistant Professor of Physiology.

NELLO PACE, Ph.D., Assistant Professor of Physiology.

HARDIN B. JONES, Ph.D., Assistant Professor of Medical Physics and Assistant Professor of Physiology.

GORDON L. WALLS, Sc.D., Associate Professor of Physiological Optics and Optometry and Lecturer in Physiology.

ELLEN BROWN, M.D., Assistant Professor of Medicine.

*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 83.

*Departmental Major Adviser:* Mr. CHAIKOFF (fall semester); Mr. OLMSTED (spring semester).

*Preparation for the Major.*—Required: course 1A-1C (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.

For fees charged in the Medical School see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

## LOWER DIVISION COURSES

1A. Introductory Physiology, Lectures. (3) I.

Mr. COOK

Prerequisite: either high school chemistry or at least 4 units of college physics or biology. Not open to entering freshmen.

Section I. Restricted to students for whose major the course is required.

Section II. Limited to 100 students. Restricted to students who wish to satisfy the Letters and Science requirement in natural science.

1C. Introductory Physiology, Laboratory. (2) I.

Mr. COOK

Prerequisite: course 1A completed or in progress.

Each laboratory section will be limited to ninety students. Preference will be given to those for whose major the course is required.

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

## UPPER DIVISION COURSES

- 100A. General Physiology. (3) I. Mr. PACE  
Prerequisite: Chemistry 1A-1B, 8; Physics 2A-2B; course 1A-1C, or Zoölogy 1A-1B, or Botany 1A-1B. Recommended: Mathematics 11A-11B.  
Lectures on the chemical, mathematical, and physical characteristics of the life process.
- \*100B. General Physiology. (3) II. Mr. PACE  
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1A-1C, or Zoölogy 1A-1B.
- 100D. General Physiology. (3) II. Mr. JONES  
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1A-1C, or Zoölogy 1A-1B. Lectures on the physiological effects of radiation.
- 101M. Human Physiology. (8) II. Mr. OLMSTED, Mr. CHAIKOFF, Miss BROWN, 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 1A, 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 1A-1C or Zoölogy 1A-1B, or consent of the instructor. Not open to students who have taken 110B.
- 104B. Physiology of the Endocrines, Laboratory. (2) I. Mr. ENTENMAN  
Prerequisite: consent of the instructor.
- \*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 1A, 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. CHAIKOFF, Mr. COPP, Mr. ENTENMAN  
Prerequisite: course 1A-1C or Zoölogy 1A-1B, Physics 2A-2B, Chemistry 1A-1B, 8. At the discretion of the instructor Biochemistry 103 or Zoölogy 1A-1B may be substituted for course 1A-1C.  
A comprehensive survey of mammalian physiology.

\* Not to be given, 1948-1949.

112. Mammalian Physiology. Laboratory only. (3) II.  
Mr. OLMSTED, Mr. CHAIKOFF, Miss BROWN,  
Mr. COPP, and Assistants  
Prerequisite: course 110A-110B completed or in progress.  
Course 112 covers the laboratory work of course 101M and is limited to  
to fifty students.
115. Morphology and Physiology of the Visual System. (3) I.  
Lectures and laboratory. Mr. COOK, Mr. WALLS  
Prerequisite: course 1A-1C or Zoölogy 1A.  
Open to students in the School of Optometry and to others by permission  
of the instructor.
- 120A-120B. Comparative Physiology. (3-3) Yr. Mr. COOK  
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1A-1C or  
Zoölogy 1A-1B. 120A is not prerequisite to 120B.  
A survey of the principal functional systems of both invertebrates and  
the lower vertebrates from the comparative point of view.
199. Special Study for Advanced Undergraduates. (2-4) I and II.  
The STAFF (Mr. COOK in charge, fall semester;  
Mr. OLMSTED in charge, spring semester)  
Prerequisite: at least 6 units of upper division courses in physiology.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

- 201A-201B. Research. (2-8; 2-8) Yr.  
The STAFF (Mr. COOK in charge, fall semester;  
Mr. OLMSTED in charge, spring semester)
203. Seminar. (1) I. Mr. COPP  
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

- <sup>2</sup> CHARLES AIKIN, LL.B., Ph.D., Professor of Political Science.  
 RAYMOND G. GETTELL, M.A., Litt.D., Professor of Political Science.  
 JOSEPH P. HARRIS, Ph.D., Professor of Political Science.
- <sup>2</sup> 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. ODEGAARD, 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 and  
 Lecturer in American Institutions.
- <sup>2</sup> N. WING MAH, Ph.D., Associate Professor of Political Science.  
 GEORGE A. LIPSKY, Ph.D., Assistant Professor of Political Science.  
 DWIGHT WALDO, Ph.D., Assistant Professor of Political Science.  
 HAROLD WINKLER, Ph.D., Assistant Professor of Political Science.
- FREDRYC R. DARBY, M.A., Lecturer in Political Science.  
 BOYNTON KAISER, A.B., Lecturer in Political Science.  
 ALEXANDER M. KIDD, A.B., LL.B., Elizabeth Josselyn Boalt Professor of Law.  
 L. DEMING TILTON, B.S., Lecturer in Political Science and Architecture.

*Letters and Science List.*—All undergraduate courses in political science except courses 166, 167A-167B, 168A-168B, 169 and 183 are included in the Letters and Science List of Courses. For regulations governing this list, see page 83.

*Departmental Major Advisers:* Mr. HARRIS, Mr. AIKIN, Mr. BELLQUIST, 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, Social Institutions 2A-2B, 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

<sup>2</sup> In residence spring semester only, 1948-1949.

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, 117, 118A, 118B, 119, 156, 157A, 157B, 158.
- II. 123, 124, 127, 128, 129, 133A, 133B, 135, 136, 138, 139, 142, 175.
- III. 140, 141, 143, 144, 145, 146, 147, 148A, 148B, 150, 151, 152, 154, 159, 160, 182.
- IV. 155, 162, 166, 167A, 167B, 168A, 168B, 169, 172, 174, 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 one section meeting 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. (3) I and II. Mr. LIPSKY  
Two lectures and one section meeting weekly.  
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.

\* Not to be given, 1948-1949.

- 112A-112B. Principles of Politics. (3-3) Yr. Mr. WINKLER  
 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. GETTELL  
 Underlying theories and principles of American governmental policy.
114. Public Opinion. (3) I. Mr. BELLQUIST  
 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. WINKLER  
 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.
117. Elements of Jurisprudence. (3) II. 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. \_\_\_\_\_
156. Comparative Administrative Law. (3) II. Mr. AIKIN  
 The law of American public administration compared with that of France and of Great Britain.
- 157A-157B. Constitutional Law of the United States. (3-3) Yr.  
 Mr. DARBY, Mr. AIKIN  
 (A) The federal system: expansion of national authority; interstate barriers; separation of powers; admission of states to the Union; interstate compacts; constitutional amendments; treaties.  
 (B) 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

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.

\* Not to be given, 1948-1949.

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.
129. *The Foreign Policies of the Great Powers.* (3) II. Mr. RUSSELL  
A study of the basic factors—historic, geographic, economic, strategic, and ideologic—that underlie and condition the foreign policies of the principal powers.
- 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.
135. *Political Development of China.* (3) II. 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) I. \_\_\_\_\_  
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) II. 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  
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.

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\* Not to be given, 1948-1949.

## Group III—Government and Politics

140. Politics of Labor. (3) II. Mr. WINKLER  
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.
141. 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.
143. Government of the British Dominions. (3) II. Mr. WALDO  
Development of the New British Empire and imperial relations of the self-governing dominions; government of Canada, Australia, New Zealand, and South Africa; conditioning historical, economic, and racial factors.
144. Government of Great Britain. (3) I. Mr. WALDO  
Origins, laws, and conventions of the British constitution; popular participation and political parties; parliament and the law-making process: king, prime minister, cabinet, civil service, and the organs and processes of administration; the judiciary; local government.
- \*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.
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 coöperation.
- \*147. Government and Policies of Germany. (2) Mr. BELLQUIST
- 148A-148B. Governments of Latin America. (3-3) Yr. Mr. MACDONALD  
The structure of Latin-American governments; parties and politics; governmental activities and problems. 148A emphasizes the A B C powers and Peru; 148B stresses Mexico and the Caribbean area, and traces the growth of Pan-Americanism.
- \*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 courses 1 or 151. Accepted in partial satisfaction of the American History and Institutions Requirement.
151. American National Government. (3) I. Mr. ODEGARD  
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.

\* Not to be given, 1948-1949.



152. Political Parties. (3) I and II. Mr. HARRIS, Mr. ODEGARD  
 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  
 Structure, internal organization, limitations, and methods of transacting business in Congress, state legislatures, and city councils; influences at work in such bodies; character of the legislative output.
- \*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. HARRIS  
 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.
166. Legal Medicine. (3) I. \_\_\_\_\_  
 Prerequisite: Zoölogy 10 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; of body parts including skeletal remains to ascertain race, sex, age, size, and identity; of the body's response to poisons.
- 167A-167B. Principles of Police Organization and Administration. (3-3) Yr.  
 167A is prerequisite to 167B. Mr. WILSON  
 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.

\* Not to be given, 1948-1949.

## 168A-168B. Criminal Investigation and Identification. (2-2) Yr.

Mr. WILSON

Principles involved in the investigation of crime scenes; searching for, preserving, and recording physical evidence; interrogation of witnesses and suspects; the identification of persons and property, including a discussion of fingerprint identification.

## 169. Legal Relations Involved in Criminology. (3) II.

Mr. KIDD

Prerequisite: at least junior standing and Political Science 167A-167B. History of criminal law, relation to civil law, Penal Code, arrest, searches and seizures, evidence, special classes of persons.

## 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. ———

## 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.

## 183. Public Personnel Administration. (3) I.

Mr. HARRIS

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. HARRIS

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.

\* Not to be given, 1948-1949.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156. 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) II. Mr. WINKLER  
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
214. The Scope and Method of Political Science. (2) I. Mr. WINKLER  
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
- 231A-231B. Seminar in International Organization. (2-2) Yr. Mr. RUSSELL
- 232A-232B. Seminar in International Relations. (2-2) Yr. Mr. LIPSKY
- 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.
- 238A\*-238B. Seminar in International Relations: The Far East and the Pacific Area. (2-2) Yr. \_\_\_\_\_  
Open to students who have already had basic training in international politics of the Far East.
- 248A-248B. Seminar in Comparative Government. (2-2) Yr. Mr. BELLQUIST  
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) I. 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) II. Mr. WALDO
- 255A-255B. Seminar in Federal Administration. (2-2) Yr. Mr. MAY  
Special studies in problems of federal administration.

\* Not to be given, 1948-1949.

- 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. 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
- 273A-273B. Research in Public Personnel Administration. (2-2) Yr.  
Mr. KAISER  
The first semester is devoted to an advanced study of the major aspects of public personnel administration; the second semester consists of research assignments on selected topics.  
Course 273A or equivalent training is prerequisite to 273B, or consent of the instructor.
- \*274A-274B. Public Expenditure and Financial Administration. (2-2) Yr.  
Mr. HARRIS
- \*275A-275B. Research in the Administration of Criminal Justice. (2-2) Yr.
- 281A-281B. Seminar in Public Administration. (2-2) Yr. Mr. HARRIS  
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. HARRIS in charge)
298. Individual Study. (1-4) I and II. The STAFF (Mr. WINKLER 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 coöperates with governmental agencies in placement. It is prepared to coöperate with upper division students in arrang-

\* Not to be given, 1948-1949.

ing 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

OLGA L. BRIDGMAN, M.D., Ph.D., Sc.D., Professor of Psychology and Pediatrics.

<sup>1</sup> CLARENCE W. BROWN, Ph.D., Professor of Psychology.

WARNER BROWN, Ph.D., Professor of Psychology.

EGON BRUNSWIK, 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.

EDWARD C. TOLMAN, Ph.D., Professor of Psychology.

ROBERT CHOATE TRYON, Ph.D., Professor of Psychology (Chairman of the Department).

GEORGE M. STRATTON, Ph.D., Professor of Psychology, Emeritus.

EGERTON L. BALLACHEY, Ph.D., Associate Clinical Professor of Psychology.

<sup>1</sup> EDWIN E. GHISELLI, Ph.D., Associate Professor of Psychology.

DAVID KRECH, Ph.D., Associate Professor in Psychology.

R. NEVITT SANFORD, Ph.D., Associate Professor of Psychology.

HUBERT S. COFFEY, Ph.D., Assistant Professor of Psychology.

RHEEM F. JARRETT, Ph.D., Assistant Professor of Psychology.

ALEX C. SHERIFFS, Ph.D., Assistant Professor of Psychology.

READ D. TUDDENHAM, Ph.D., Assistant Professor of Psychology.

EDWARD N. BARNHART, Ph.D., Lecturer in Psychology and Assistant Professor of Speech.

NANCY BAYLEY (Nancy Bayley Reid), Ph.D., Lecturer in Psychology.

ELSE FRENKEL-BRUNSWIK, Ph.D., Lecturer in Psychology.

JANE HAMILTON RANZONI, A.B., Lecturer in Psychology.

ROBERT E. HARRIS, Ph.D., Lecturer in Psychology and Associate Professor of Medical Psychology.

LUDWIG IMMERGLUCK, Ph.D., Lecturer in Psychology.

MARY C. JONES, Ph.D., Lecturer in Psychology.

<sup>2</sup> CATHERINE LANDRETH, Ph.D., Lecturer in Psychology and Associate Professor of Home Economics.

AUDREY SCHUMACHER, 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 83.

*Departmental Major Advisers:* Mr. BALLACHEY, Mr. TUDDENHAM (Clinical Psychology); Miss BRIDGMAN, Mr. JARRETT; Graduate Advisers: Mr. COFFEY, Mr. GHISELLI, Mrs. RANZONI, Mr. JONES.

*Preparation for the Major.*—Required: courses 1A, 1B, and 5, and either Physiology 1A, 1C, or Zoölogy 1A-1B. Recommended: French, German, chemistry, physics, Speech 12. Note that second-year high school algebra or Mathe-

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

\* Absent on leave, 1948-1949.

matics D is prerequisite to course 5, and that Physiology 1A and 1C are not open to freshmen.

Courses 1B and 5 are not open to entering freshmen. The required physiology or zoölogy should, if possible, be included in the program of the freshman or sophomore years and must be completed before the beginning of the senior year.

*The Major.*—Required: 24 upper division units which must include courses 106A and 107, preferably to be taken during the junior year. (Speech 119 may be included as a course in psychology.) At least 6 units of upper division psychology must be taken after the completion of courses 106A and 107. Six of the 24 units constituting the major may be chosen, subject to approval, from the following: Anatomy 102, 103; Business Administration 153; Economics 106, 150A, 150B, 180; Education 110, 113, 116, 153, 154; Genetics 100, 102; Home Economics 132, 133, 142; Optometry (Physiological Optics) 105B, 106B; Political Science 181, 183; Social Welfare 105, 106, 108; Speech 117A–117B, 118; Zoölogy 114, 115; any upper division course in anthropology, philosophy, physiology, or sociology and social institutions. Attention of the student is directed to prerequisites for courses which may be elected in the major program.

In planning a major in psychology the student should note that four semesters of work are required in the upper division. Unless all the preparatory courses have been completed in the lower division, more than four semesters may be required in the upper 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 included in the major. Students who cannot maintain such an average may be required at any time to withdraw from the major in psychology.

*Honor Students.*—Candidates for honors should consult the chairman of the department. Honors are usually granted on the basis of the whole record of the student. The department extends to candidates for honors special privileges and guidance in experimental work and reading, arranges for conferences with the instructors in charge of students' work, and does not always insist upon the completion of formal prerequisites. The attention of honor students is directed to course 199.

#### LOWER DIVISION COURSES

1A. General Psychology. (3) I and II. Mr. KRECH, Mr. W. BROWN  
Three lectures and section meeting weekly. Not open to freshmen.

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.

2. Survey of Psychology. (3) II. Mr. SHERRIFFS  
Prerequisite: course 1A. Not open for credit to students who have completed 1B.

A continuation of course 1A intended primarily for students who will not continue in psychology. A survey of the special fields and applications of psychology.

The sequence 1A–2 or 1A–1B will be accepted in fulfillment of requirement (e) for the degree of Associate in Arts.

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 Statistical Methods in Psychology. (3) I and II.  
Mr. JARRETT and Teaching Assistants.  
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 completed or in progress. 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.

## UPPER DIVISION COURSES

Course 1A and junior standing are prerequisite to all upper division courses, except 180 and 185, for which course 3 may be used as prerequisite. For psychology majors 1B is prerequisite to all except 160, 180, 185 (students not majoring in psychology may substitute course 2 for 1B, with the consent of the instructor). Course 5 or its equivalent is prerequisite to all except 108A-108B, 120, 134, 160, 168, 180, 185.

- \*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.
- 106A. Experimental Psychology. (3) I and II.  
Mr. BRUNSWIK, Mr. W. BROWN, and Teaching Assistants  
Lectures and laboratory.  
Prerequisite: course 5 or an equivalent course in statistics.  
A survey with performance of typical experiments on reaction tendencies, perception, learning and problem solving. Emphasis on methods of experimentation.
- \*106B. Experimental Psychology. (3) II.  
Mr. W. BROWN and Teaching Assistants  
Lectures and four hours laboratory to be arranged.  
Individual laboratory problems.
107. Advanced Statistical Methods in Psychology. (3) I and II.  
Mr. C. W. BROWN, Mr. JARRETT  
Lectures and laboratory. Students will enroll for their sections on Friday and Saturday of the week of registration.  
Prerequisite: course 5 or an equivalent course in statistics.  
Reference points and units of measurement, correlation, reliability and validity, scoring of individual achievement, partial and multiple correlation, construction of scaled tests, representation of learning functions.

\* Not to be given, 1948-1949.



- 108A. Physiological Psychology. (3) I. Mr. JARRETT  
Lectures and laboratory. Enrollment limited to twenty students.  
Prerequisite: Physiology 1A or consent of the instructor.
- \*108B. Physiological Psychology. (3) II. \_\_\_\_\_
- \*109. Measurement of Traits. (3) I. Mr. TRYON  
Prerequisite: course 107.  
Experimental evidence on interrelations between intelligence, emotion, temperament, and attitudes; objective theories of ability; mental "factors"; theories of Thorndike, Spearman, Thomson, Kelley, et al.
112. Child Psychology. (2) I. Mr. JONES  
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  
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  
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. (1) I and II. Miss BAYLEY  
Laboratory work at the Institute of Child Welfare, accompanying course 116. Admission only by permission of the instructor.
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, gestaltpsychology, 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.

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\* Not to be given, 1948-1949.

131. Perception. (3) I. 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. KRECH  
 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) I. 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  
 Prerequisite: course 168.  
 A consideration of the social and cultural determinants of personality.
143. Propaganda. (3) II. Mr. KRECH  
 Theory of suggestion, imitation, and propaganda; the function of speech in propaganda and communication; analysis of current propaganda techniques and objectives.
- Analysis of Communication Content (Speech 119). (3) II.  
 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.
- 145A. Social Psychology. (3) I. Mr. KRECH  
 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.
- 145B. Social Psychology. (3) II. Mr. BALLACHEY, Mr. TRYON  
 Lectures and laboratory.  
 Prerequisite: Psychology 142 or 3 units of social psychology, and the consent of the instructor to enroll.  
 A laboratory course in the methodology of survey techniques, covering problems in the designing and carrying out of opinion, attitude and other types of social surveys.
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. TOLMAN  
General survey of the behavior of the higher animal forms.
- \*150B. Animal Psychology. (3) I. Mr. TOLMAN  
A more intensive survey of the experimental literature on learning, motivation and problem solving in the higher forms. Lectures and laboratory demonstrations.
151. Experiments in Animal Psychology. (3) II. Mr. TOLMAN  
One lecture and six hours laboratory to be arranged. Prerequisite: course 150A and consent of the instructor.
160. Mental Deficiency. (3) I. Miss BRIDGMAN  
Prerequisite: course 1A.  
Mental deficiency and abnormality in children, including a consideration of tests used in clinical examinations.
162. Clinical Psychology. (3) I and II. Mr. TUDDENHAM, Mr. SHERRIFFS  
Prerequisite: course 5 or equivalent, and 112, 113, 160, 168, or Home Economics 132.  
Behavior of normal children. Dynamics of personality development.
168. Abnormal Psychology. (3) II. Miss BRIDGMAN  
Prerequisite: 6 units of upper division psychology or, with consent of the instructor, premedical status.  
The relations of psychology to the psychoneurosis and insanity; the appearance of abnormal traits in incipient stages of mental disturbance.
- \*180. Psychological Aspects of Advertising, Selling, and Market Research. (3) I. Mr. GHISELLI  
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. Mr. GHISELLI  
Prerequisite: courses 1A, 3, or Business Administration 153.  
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. Mr. GHISELLI  
Prerequisite: courses 162 or 185 and consent of the instructor. For seniors and graduates.  
Principles of occupational counseling, nature and sources of occupational information, evaluation and use of standard occupational tests.

\* Not to be given, 1948-1949.

## 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 standing in psychology is prerequisite to all graduate offerings. It 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. Concerning conditions for admission to graduate courses, see also page 156.

Seminars are designated by use of the letters E and F and, unless otherwise specified, will be offered as needed and at times to be arranged at the beginning of each semester.

## 201. General Seminar (no credit). I and II.

The STAFF (Mr. MACKINNON in charge)

## \*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.

Prerequisite: 106A or equivalent.

## 208E. Seminar in Physiological Psychology. (2) I.

Mr. JARRETT

## 209E. Seminar in Individual Differences. (2) II.

Mr. TRYON

## 212E. Seminar in Developmental Psychology. (2) I.

Mr. JONES, Mrs. FRENKEL-BRUNSWIK, Mrs. JONES

Prerequisite: consent of the instructors.

## 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.

Advanced 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 and nomothetic approach.

## †231E. Perception and Representative Experimental Design. (2) I and II.

Mr. BRUNSWIK

Prerequisite: courses 106A, 107, and 131, or consent of the instructor.

\* Not to be given. 1948-1949.

† To be given as needed and at times to be arranged at the beginning of each semester.

240. Personality Assessment. (3) I. Mr. MACKINNON  
Lectures and practicum.  
Prerequisite: consent of the instructor.  
The rationale and practice of procedures for the diagnosis and assessment of personality.
242. Opinions, Beliefs, and Attitudes. (3) I. Mr. KRECH  
Enrollment limited to twenty-five students.  
Prerequisite: consent of the instructor.  
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 145A and consent of the instructor.  
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.
- 245E. Seminar in Social Psychology. (2) I. Mr. TRYON  
Enrollment limited to sixteen students.  
Prerequisite: consent of the instructor.  
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.
247. Advanced Group Dynamics and Group Therapy. (3) I. Mr. COFFEY  
Two two-hour sessions a week.  
Prerequisite: background in social and clinical psychology, and consent of the instructor. Social welfare students, if psychiatric social workers, may be admitted.  
Ways in which groups may be utilized in the training and therapy of the individual, survey of pertinent literature, and actual experience with group techniques such as role playing, psychodrama, reality testing, as training and therapeutic devices.
- 247E. Seminar in Group Dynamics and Group Therapy. (2) II. Mr. COFFEY  
Prerequisite: consent of the instructor.
- 248E. Seminar in Personality. (2) I. Mr. SANFORD  
Prerequisite: consent of the instructor.
249. Experimental Psychodynamics. (3) II. Mr. MACKINNON  
Two hours of lecture and four hours of laboratory work a week to be arranged.  
Prerequisite: courses 106A, 134, and 141, and consent of the instructor.  
A general survey of the psychodynamics of behavior, with special emphasis upon the experimental literature.

- 249E. Seminar in Dynamic Psychology. (2) I. Mr. MACKINNON
- †250E. Seminar in Animal Psychology. (2) I and II. Mr. TOLMAN  
Prerequisite: course 150A and consent of the instructor.
- 261A. Clinical Methods. (3) I. Mr. COFFEY  
Lecture and laboratory; four hours of field work to be arranged.  
Prerequisite: course 162, graduate standing, and consent of the staff.  
Consideration of clinical methods of measurement, interview, and observation.
- 261B. Advanced Clinical Methods. (3) II. Mr. BALLACHEY, Mr. IMMERGLUCK  
Lecture and laboratory; four hours field work to be arranged.  
Prerequisite: course 261A and consent of the staff.
- 262A. Advanced Clinical Diagnostic Testing. (2) I. Mr. HARRIS  
Prerequisite: course 162 and consent of the instructor.  
Theory and practice of personality testing.
- 262E. Advanced Clinical Diagnostic Testing. (2) II. Mr. SANFORD  
Prerequisite: course 162 and consent of the instructor.  
Scoring and interpretation of the Thematic Apperception Test.
- 263A-263B. The Rorschach Method. (2-2) Yr. Mrs. RANZONI, Mr. HARRIS  
263A is prerequisite to 263B. Consent of the instructor is required for enrollment in either half of the course.  
Scoring and interpretation of the Rorschach test of personality diagnosis.
- 264E-264F. Seminar in Case History. (2-2) Yr.  
Mr. BALLACHEY, Mr. COFFEY, Mr. IMMERGLUCK,  
Mrs. RANZONI, Mr. TUDDENHAM  
264E is prerequisite to 264F.  
Prerequisite: course 261B and consent of the staff.  
The case history method in psychology with emphasis on diagnostic aspects.
- 265E-265F. Advanced Seminar in Case History. (2-2) Yr.  
Mrs. SCHUMACHER, Mr. SHERRIFFS  
Prerequisite: course 264F and consent of the staff. (265E is prerequisite to 265F.)  
The case history method in psychology with emphasis on therapeutic aspects.
- 266E. Seminar in Theories of Therapy. (2) I. Mrs. SCHUMACHER  
Prerequisite: course 264F and consent of the instructor.  
A critical survey of the major theories upon which psychotherapy is based.
- 267E. Seminar in Medical Psychology. (2) II. \_\_\_\_\_  
Prerequisite: consent of the instructor.
- †268E. Seminar in Abnormal Psychology. (2) I and II. Miss BRIDGMAN  
Prerequisite: 12 upper division units of basic psychology.

† To be given as needed and at times to be arranged at the beginning of each semester.

†285E. Seminar in Applied and Industrial Psychology. (2) I and II.

Prerequisite: course 185.

Mr. GHISELLI

290. Research Methods in Psychology. (3) II.

Mr. KRECH

Enrollment limited to ten students.

A discussion of the objectives and characteristics of research with special emphasis on the unique problems of psychological research. Lectures by the instructor and papers to be submitted by students.

299. Research. (1-6) I and II.

The STAFF

Laboratory, library, or field work as the problem requires.

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† To be given as needed and at times to be arranged at the beginning of each semester.

## PUBLIC HEALTH

JESSIE M. BIERMAN, A.B., M.D., M.S.P.H., Professor of Maternal and Child Health.

HAROLD B. GOTAAS, 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 (Chairman of the Department).

JACOB YERUSHALMY, M.A., 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, M.S., M.D., Associate Professor of Industrial Health.

WALTER S. MANGOLD, B.S., Associate Professor of Public Health.

WILLIAM W. STILES, B.S., M.D., M.P.H., Associate Professor of Public Health.

CHARLES H. HINE, M.A., Ph.D., M.D., Assistant Professor of Industrial Toxicology.

NELL HOLLINGER, Ph.D., Assistant Professor of Laboratory Practice.

EDITH LINDSAY, M.A., Ed.D., Assistant Professor of Public Health and Lecturer in Education.

WILLIAM W. SAMPSON, Ph.D., Instructor in Public Health.

BLAIRE N. BENNETT, B.S., Associate in Public Health.

WILLIAM J. HAYES, B.S., Associate in Public Health.

JOAN JAMES, B.S., Associate in Public Health.

JEAN MACDONALD, B.S., Associate in Public Health.

CHARLES R. NICEWONGER, M.A., Associate in Public Health.

JEAN NAYLOR, B.S., Associate in Public Health.

FERN SCHNEIDER, M.A., Associate in Public Health.

MARY LOU SKINNER, B.S., M.P.H., Associate in Public Health.

WILLIAM F. TAYLOR, A.B., Associate in Public Health.

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DWIGHT M. BISSELL, M.A., M.D., M.S.P.H., Lecturer in Public Health.

HAROLD D. CHOPE, A.B., M.D., M.P.H., Lecturer in Public Health.

KARL M. BOWMAN, Professor of Psychiatry and Lecturer in Public Health.

DEAN A. CLARK, B.A., B.Sc., M.D., Lecturer in Medical Economics.

PETER COHEN, M.D., Lecturer in Public Health, for the spring semester only.

SEYMOUR M. FARBER, M.D., Lecturer in Public Health.

FERN FRENCH, M.A., 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., Lecturer in Public Health.

† Sabbatical leave in residence, fall semester, 1948-1949.



- EDWIN H. LENNETTE, M.D., Ph.D., Lecturer in Virology.  
 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.  
 SYDNEY S. NORWICK, B.S., M.D., M.P.H., Lecturer in Medical Economics.  
 WILLIAM C. REEVES, Ph.D., Lecturer in Public Health.  
 MARION W. SHEAHAN, B.S., Lecturer in Public Health Administration.  
 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.

*Letters and Science List.*—Courses 5A–5B, 35, 160A–160B are included in the Letters and Science List of Courses. For the regulations governing this list, see page 83.

#### 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 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) I and 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 laboratory practice and demonstrations 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) I and II.  
 Mr. YERUSHALMY and the STAFF  
 Lectures, 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; elementary methods of analysis.
35. Personal Health Problems. (3) I and II. Miss LINDSAY  
 (Formerly numbered 2 and 21.)  
 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) I and II.

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

## 101A-101B. Laboratory in Administration. (1-1) Yr.

Laboratory, three hours.

Mr. ROGERS, Miss SCNEDER

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: principles of accounting (with laboratory). Restricted to students enrolled in the School of Public Health.

Consideration of the fundamentals of organization, business and financial management, personnel management, plant operation, staff organization, and community relationships as applied to hospital administration.

## 105. Public Health Administration. (3) I and II.

Mr. KELLY

Prerequisite: course 5A-5B or consent of the instructor.

Lectures, reading, and individual reports in public health administration and procedures.

## †108. Advanced Problems in Public Health Administration. (1-5) I and II.

(Formerly numbered 196.)

Mr. ROGERS

## †109. Advanced Problems in Medical Administration. (1-5) I and II.

Mr. ROGERS

## 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.

## 112. Control of Rodents Affecting the Public Health. (2) I and II.

(Formerly numbered 115.)

Mr. SAMPSON

Prerequisite: consent of the instructor to enroll.

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. 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 general sanitation covering communicable disease control, water and sewage, housing, ventilation, lighting, and vector control.

† To be given if a sufficient number of students enroll.

- 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.
- †114. Advanced Problems in Sanitation. (1-5) I and II. Mr. MANGOLD
125. Child Hygiene. (3) II. Mr. COHEN  
(Formerly numbered 121.)  
Lectures, three hours; and conference hours.  
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. Mrs. SKINNER, 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.
134. Community Health Education. (2) I and II. Miss NYSWANDER  
Primarily for students majoring in health education who have taken basic courses in biological sciences, education, and psychology. Theory and field problems in community health education. Review of studies relating to factors affecting group learning.
135. Individual Health. (3) I. Miss LINDSAY  
(Formerly numbered 122.)  
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. HAMMON, Mr. BISSELL  
The epidemiology and community control of communicable disease, including tuberculosis and the venereal infections.
- 147A. Principles of Epidemiology. (2) I and II. Mr. HAMMON  
Prerequisite: knowledge of medical bacteriology and biostatistics at least equivalent to that presented in courses 162 and Bacteriology 107.  
Principles of epidemiology and a study of the infection chains of certain type diseases.
- 147B. Applied Epidemiology. (2) II. Mr. HAMMON, Mr. STILES, Mr. REEVES  
Discussion and lectures, two hours; laboratory, three hours. Separate discussion hours for those with an M.D. degree and others with background in the study of communicable diseases.  
Prerequisite: course 147A or 245.  
Methods of investigating epidemics, collection of data, their analysis, and making a report.

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† To be given if a sufficient number of students enroll.

- †149. Advanced Problems in Epidemiology. (1-5) I and II. Mr. HAMMON  
Prerequisite: course 147B or consent of the instructor.
- 150A. Clinical and Public Health Laboratory Procedures. (8) I.  
Miss HOLLINGER, Miss JAMES, Mr. HAYES, Miss ANDERSON  
Prerequisite: Biochemistry 103 and Bacteriology 101, completed or taken concurrently, and consent of the instructor. Enrollment limited to forty students.  
Basic principles and laboratory methods in physiological chemistry, hematology, and mycology, as required in clinical and public health practices.
- 150B. Clinical and Public Health Laboratory Procedures. (8) II.  
Miss BEATTIE, Mr. NICEWONGER, Miss NAYLOR  
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  
Lecture, two hours; laboratory, 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 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 laboratory problems.
- 160A. Biometry. (3) I and II. Mr. TAYLOR  
Lecture, 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  
Lecture, 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  
Lecture, 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.

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† To be given if a sufficient number of students enroll.

- 161B. Applied Biostatistics. (4) II. Mr. YERUSHALMY  
Lecture, 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  
Lecture, 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.
163. Demography. (2) II. Mr. YERUSHALMY and the STAFF  
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 and the STAFF  
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. Mr. YERUSHALMY and the STAFF  
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  
Lecture, 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. GOTAAS  
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 1A-1C; or equivalent courses.  
Chemical and clinical laboratory techniques applied to investigation of toxic manifestations of industrial hazards.

† To be given if a sufficient number of students enroll.

186. Control of Venereal Diseases. (2) I and II. Mr. KOCH  
 Discussion, laboratory, and field observation, four 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.
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. ROGERS in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 The STAFF (Mr. ROGERS in charge)

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

- 200A-200B. Principles of Public Health Organization and Administration.  
 (3-3) Yr. Mr. ROGERS, Miss SCNEDER  
 Lecture, 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. (1-1) Yr.  
 Mr. CLARK, Mr. NORWICK
- 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. GOTAAS, Mr. GRAY
- 214A-214B. Seminar in Sanitation. (2-2) Yr.  
 Mr. MANGOLD, Mr. GOTAAS, Mr. GRAY
- \*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, health instruction, environmental factors, communicable disease control, and hygiene of the school day. Students will undertake field studies.

\* Not to be given, 1948-1949.

- 228A. Group Study in Maternal Health. (2) II. Miss BIERMAN  
Prerequisite: open to those with an M.D. degree, with the consent of the instructor.
- 228B. Group Study in Child Health and Development. (2) II. Miss BIERMAN  
Prerequisite: open to those with an M.D. degree, with the consent of the instructor. Course 228A not prerequisite to 228B.  
Study of developmental problems of infants and young children. Offers opportunity for intensive work with young children and their parents.
- 229A. Seminar in Maternal and Child Health Administration. (1) I. Miss BIERMAN  
Prerequisite: consent of the instructor to enroll.  
Deals with problems of maternity and infancy and the public health programs designed to deal with them. Students will undertake field studies.
- 229B. Seminar in Maternal and Child Health Administration. (1) II. Miss BIERMAN  
Includes field work.  
To consider the problems of the preschool years, later childhood, adolescence, and of handicapped children, with study of the public health programs designed to deal with them.
233. Group Work Procedures in Health Education. (2) II. 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. (1-2) Yr. Miss NYSWANDER  
(Formerly numbered 293A-293B.)  
Prerequisite: open to graduate students in public health, nutrition, home economics, and related fields with consent of the instructor.  
A consideration of the factors influencing community participation in group work. Attention will be given to divergent philosophies of community organization, with special reference to voluntary and public health agencies.
245. Biology of Infectious Diseases (Epidemiology). (4) I. Mr. HAMMON in charge  
(Formerly numbered 241 and 251.)  
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 of the infection chain. Consideration of most recent advances in microbiological laboratory methods and interpretation of results, particularly as applied to epidemiological investigations.
- †246. Epidemetrics. (2) II. Mr. HAMMON, Mr. YERUSHALMY  
Seminar, two hours; laboratory, two hours.  
Prerequisite: courses 245 and 262, or 160A and 161A.  
Quantitative methods in epidemiology, including methods used in the study of chronic disease, theoretical and experimental epidemics, and other statistical methods.

† To be given if a sufficient number of students enroll.

- †246. Advanced Problems in Epidemiology. (1-5) I and II. Mr. HAMMON  
Prerequisite: courses 245 or 147B (may be taken concurrently); and 261 or 160A and 161A.
- †249A-249B. Seminar in Epidemiology. (1-1) I and II. Mr. HAMMON
- †254A-254B. Seminar in Public Health Laboratory. (1-1) I and II.  
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  
Lecture, 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.
- †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  
Lectures, one hour; laboratory, three hours.  
Prerequisite: course 260 completed or taken concurrently.  
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. Mr. YERUSHALMY and the STAFF  
Research projects undertaken by students under the direction of the staff.

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† To be given if a sufficient number of students enroll.



†269A-269B. Seminar in Biostatistics. (1-1) Yr. Mr. YERUSHALMY

†274A-274B. Seminar in Industrial Health. (1-2) Yr. Mr. LEWIS

287. Clinical Problems in Public Health. (1-4) I and II.

Mr. ROGERS in charge

Deals with selected clinical subjects of major importance to public health and presents clinical observations and discussion of the most recent advances in diagnosis, treatment, and prevention.

297. Directed Field Study. (No credit.) I and II.

The STAFF (Mr. ROGERS in charge)

298. Directed Group Study for Graduate Students. (1-5) I and II.

The STAFF (Mr. ROGERS in charge)

299. Special Study for Graduate Students. (1-5) I and II.

The STAFF (Mr. ROGERS in charge)

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† To be given if a sufficient number of students enroll.

## ROMANCE PHILOLOGY

\*FRANCIS J. CARMODY, Ph.D., Professor of French.

\*YAKOV MALKIEL, Ph.D., Associate Professor of Romance Philology.

ROBERT K. SPAULDING, Ph.D., Associate Professor of Spanish.

RONALD N. WALPOLE, Ph.D., Associate Professor of French.

NOTE.—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. SPAULDING

†203. Old Provençal. (2) II. Mr. WALPOLE

‡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).

\* Absent on leave, 1948–1949.

† To be given if a sufficient number of students enroll.

‡ Not to be given, 1948–1949.

## SCANDINAVIAN LANGUAGES AND LITERATURE

ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology  
(Chairman of the Department).

ASSAR GÖTRIK JANZÉN, Ph.D., Visiting 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 83.

## 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.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
 Mr. JANZÉN

\* Not to be given, 1948-1949.

## SLAVIC LANGUAGES

WACLAW LEDNICKI, Ph.D., Professor of Slavic Languages.

<sup>1</sup> GLEB STRUVE, A.B., 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 (Chairman of the Department).

LYDIA I. PENNELL, A.B., Associate in Russian.

DMITRY F. GRIGORIEFF, M.A., Lecturer in Russian.

GEORGE C. GUINS, LL.M., Lecturer in Russian.

LUDMILA A. PATRICK, M.A., Lecturer in Russian.

BOŽENA POSPÍŠILOVÁ, Ph.D., Lecturer in Czech.

NOEL A. VOGEL, A.B., 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 83.

*Departmental Major Adviser:* Mr. MASLENIKOV.

*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. Beginning each semester.

Mrs. PATRICK in charge

Two lectures and three recitation hours weekly. See also course 18A.

2. Elementary Russian. (4) I and II. Beginning each semester.

Mr. MASLENIKOV 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 Russian 2. Reading, composition, translation. Not required for 102A.

<sup>1</sup> In residence fall semester only, 1948-1949.

- 6A-6B. Elementary Polish. (3-3) Yr. \_\_\_\_\_
- \*10A-10B. Elementary Serbo-Croatian. (3-3) Yr.
- \*14A-14B. Elementary Czech. (3-3) Yr. Mr. MASLENIKOV in charge
- 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. PATRICK
- 103A-103B. Third-year Russian. (3-3) Yr. Mr. GUINS, Mrs. PATRICK
- 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. LEDNICKI
- \*108A-108B. Third-year Polish. (3-3) Yr. Mr. LEDNICKI
- \*111A-111B. Second-year Serbo-Croatian. (3-3) Yr. \_\_\_\_\_
- 112A-112B. Third-year Serbo-Croatian. (3-3) Yr. Mr. VOGÉ
- 115A-115B. Second-year Czech. (3-3) Yr. Miss POSPÍŠILOVÁ
- \*116A-116B. Third-year Czech. (3-3) Yr. \_\_\_\_\_
- 119A-119B. Intermediate Russian Conversation. (2-2) Yr. Mrs. PATRICK
- 120A-120B. Advanced Russian Conversation. (2-2) Yr. Mr. GRIGORIEFF
121. The Pronunciation of Russian. (2) I.  
Phonetics and accentuation. Mr. MASLENIKOV
122. The Russian Language. (2) II.  
Morphological and etymological structure. Mr. MASLENIKOV
123. Russian Syntax. (2) II. Mr. GUINS
- 124A-124B. Advanced Russian Composition.  
Open to students enrolled in Russian 103 or 104. Mrs. PATRICK
198. Advanced Group Work. (1-3) I and II. \_\_\_\_\_  
The STAFF (Mr. MASLENIKOV in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. MASLENIKOV in charge)

\* Not to be given, 1948-1949.

## 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. STRUVE  
 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. Recent Russian Literature (1880-1947). (3) II. Mr. MASLENIKOV  
 Garshin, Chekhov, Gorki, Andreyev, Bunin, Kuprin, Korolenko, the Symbolists, and others.
132. Russian Literature Since 1917. (2) II. Mr. STRUVE  
 Alexey Tolstoy, Gladkov, Fadeyev, Fedin, Leonov, Sholokhov, Simonov, Aldanov, Nabokov, and others.
- \*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. Tolstoy and Dostoyevski. (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: course 130A or its equivalent.  
 Study of form and content from the Byliny to present-day poetry.
- \*138. Modern Russia. (2) I. Mr. GUINS  
 Prerequisite: junior standing.  
 Life and intellectual currents of modern Russia as reflected primarily in Russian literature.
- \*144. Slavic Folklore. (2) I. \_\_\_\_\_
- \*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 Krasinski.

\* Not to be given, 1948-1949.

† To be given if a sufficient number of students enroll.

- \*160. Survey of Czech and Slovak Literature. (2) II. \_\_\_\_\_  
 The development of Czech and Slovak literature from the sixteenth century to the present.
- \*170. Survey of South Slavic Literature. (2) II. \_\_\_\_\_
- 180A-180B. Survey of Russian Culture. (2-2) Yr. Mr. GUINS  
 The development of Russian ideas from the earliest days to the present; and achievements in literature, art, music, education, and science.
185. Survey of Slavic Culture. (2) I. \_\_\_\_\_
188. The Slavic-Speaking World. (1) II. Mr. LEDNICKI  
 Linguistic survey of Slavic-speaking peoples.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.

## Language Courses

200. Slavic Bibliography. (1) II. The STAFF
- 224A-224B. Old Church Slavic. (2-2) Yr. Mr. MASLENIKOV  
 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 224. Relation of Old Church Slavic to Russian and other Slavic languages.
226. Early Russian; Historical Russian Grammar. (2) I. Mr. MASLENIKOV

## Literature Courses

- \*237. Early Russian Literature. (2) I. Mr. STRUVE
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. MASLENIKOV in charge)

Graduate students will be offered opportunities for independent reading and study. Credit will be assigned according to the amount of work done.

\* Not to be given, 1948-1949.

**SOCIAL WELFARE**

MILTON CHERNIN, Ph.D., Associate 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.

PEARL L. AXELROD, M.A., Assistant Professor of Social Welfare.

HAZEL H. FREDERICKSEN, M.A., Assistant Professor of Social Welfare.

GORDON HEARN, M.S., Assistant Professor in Social Welfare.

MARTIN B. LOEB, A.B., Assistant Professor of Social Welfare.

MAURINE MCKEANY, M.A., Assistant Professor of Social Welfare and Supervisor of Field Work.

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PEARL H. BERMAN, M.S.S., Lecturer in Social Welfare.

\*RUTH COOPER, M.A., Lecturer in Social Welfare.

SALLY DEWEES, M.S., Lecturer in Social Welfare.

MARY E. DUREN, M.S., Lecturer in Social Welfare.

ERIK H. ERIKSON, Lecturer in Social Welfare.

ANNA MAENCHEN, Ph.D., Lecturer in Social Welfare.

JULIA R. TARNAPOL, M.S.W., Lecturer in Social Welfare.

HASSELTINE BYRD TAYLOR, J.D., Ph.D., Lecturer in Social Welfare.

ADDIE THOMAS, M.A., Lecturer in Social Welfare and Acting Director of the Social Service Department, University of California.

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DOUGLAS G. CAMPBELL, M.D., Assistant Clinical Professor of Psychiatry and Lecturer in Neuroanatomy in the Medical School, and Lecturer in Social Welfare.

PETER COHEN, M.D., Lecturer in Pediatrics in the Medical School, Lecturer in Public Health, and Lecturer in Social Welfare.

PORTIA B. HUME, Assistant Clinical Professor of Psychiatry and Associate Psychiatrist, Student Health Service, and Lecturer in Social Welfare.

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 82.

*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 83.

\* Absent on leave, 1948-1949.



## UPPER DIVISION COURSES

100. The Field of Social Welfare. (3) I. Mr. LOEB  
 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 completed or in progress. 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. \_\_\_\_\_  
 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. Concepts of the social services; the historical background of the poor law and its breakup; the modern public assistance services.  
 110B. Other social services, including child welfare, mental hygiene, corrections, and social insurance, their development and present status; problems of social welfare organization and administration.

## 191. Function and Organization of the Modern Social Services. (2) I.

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) II.

Mrs. TAYLOR

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. DEWEES, Miss DUREN

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 1948-1949 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. 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.

\* Not to be given, 1948-1949.

- 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 THOMAS  
 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. Mr. COHEN, Miss THOMAS  
 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.  
 Mrs. AXELROD, 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.
262. Psychiatry and Social Work. (2) II. Mrs. HUME, ———  
 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. MCENTREE, Mrs. TAENAPOL  
 Prerequisite: Economics 40 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.

Mrs. MAENCHEN, Mr. ERIKSON

I: 266B (Mr. Erikson). Child development and family structure; the dynamics of the relationship between the social and cultural determinates of personality. This course is limited to students specializing in psychiatric social work.

Course 266A is not prerequisite to 266B.

II: 266A (Mrs. Maenchen). Dynamics of childhood behavior in conflicting situations; the contribution of psychoanalytic theory to social case work with children.

## 280. Introduction to Group Work. (2) I and II.

Mr. HEARN

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 Theory of Group Development. (2) I and II.

Mr. HEARN

Processes and stages in group growth and development; interaction of groups with cultural environment; function of group worker in group development.

## 282. Program Planning in Group Work. (2) I and II.

Mr. HEARN

The development of program activities to meet group objectives; emphasis upon program planning process rather than upon program content.

## 283. Advanced Seminar in Group Work. (2) I and 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.

## 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.

Mr. MCENTIRE, Mrs. TARNAPOL

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.

## SOCIOLOGY AND SOCIAL INSTITUTIONS

EDWARD STRONG, Ph.D., Professor of Philosophy (Chairman of the Department of Sociology and Social Institutions).

MARGARET T. HODGEN, Ph.D., Associate Professor of Sociology and Social Institutions.

ROBERT A. NISBET, Ph.D., Associate Professor of Sociology and Social Institutions.

REINHARD BENDIX, Ph.D., Assistant Professor of Sociology and Social Institutions.

KENNETH E. BOCK, Ph.D., Instructor in Sociology and Social Institutions.

C. ARNOLD ANDERSON, Ph.D., Lecturer in Sociology and Social Institutions.

WOLFRAM EBERHARD, Ph.D., Lecturer in Sociology and Social Institutions.

SEYMOUR M. LIPSET, A.B., Lecturer 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 83.

*Departmental Major Adviser:* Mr. NISBET.

*Preparation for the Major.*—Required: courses 1, 2, 10A-10B, Economics 40, or Psychology 5. Recommended: Anthropology 2A-2B, Economics 1A-1B, History 4A-4B, Philosophy 10A-10B, 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. NISBET  
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  
An introduction to social thought; role in the social sciences of leading ideas of progress and order.

## 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. 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.
- 121A\*-121B. History of Sociological Theory. (3-3) Yr. Mr. BOCK  
121B will be given in the spring semester. 121A is not prerequisite to 121B.  
Background in eighteenth-century moral philosophy and philosophy of history; establishment of sociology as a discipline; contemporary sociologists, their aims, methods, and results.
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.  
118A. The general structure and basic processes of cultural behavior; illustrative materials from primitive societies and modern civilizations.  
118B. The dynamics of culture and personality; analysis of life history materials and contemporary events.  
Either part may be taken separately.
- 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.
141. History of Western Social Organization. (3) II. Mr. NISBET  
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.
142. Comparative Institutions. (3) I. Mr. NISBET  
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 disorganization.

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\* Not to be given, 1948-1949.

144. Migration (3) II. Mr. ANDERSON  
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.
- 165A-165B. Structure of Chinese Medieval Society. (3-3) Yr. Mr. EBERHARD  
Rise of the Gentry as a ruling group. Social character of Confucianism and Taoism; spread of Buddhism. Political and economic factors; family system and its influence on politics; social status of the peasant and the slave.
- 166A-166B. Ethnic Compounds of Chinese Culture. (3-3) Yr. Mr. EBERHARD  
Results of prehistoric researches; the value of Chinese source material; the ethno-sociological method. Northern and southern culture complexes; origin of first higher cultures; formation of Shang culture; the full-developed Chinese culture.

#### 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. Mr. ANDERSON  
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.
- 136A-136B. Utilization of Human Resources. (3-3) Yr. Mr. ANDERSON  
Social structure and opportunity; structural contrasts between mobile and rigid societies; societal agencies for allocation of individuals to appropriate roles; channels of social mobility; barriers to optimum utilization of human resources; relations between social ideologies and social structures affecting opportunity.
- Social Psychology (Psychology 145A-145B). (3-3) Yr.
- \*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.  
Physical characters, distribution, and relationships of the living races of mankind.

\* Not to be given, 1948-1949.

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 groupings 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) II.

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.  
Chapters in Cultural History (Anthropology 102). (3) 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.  
Public Opinion (Political Science 114). (3) I.  
Personality (Psychology 148A). (3) II.  
Personality in Society and Culture (Psychology 141). (3) I.

GRADUATE COURSES

- 202A-202B. Seminar in Comparative Analysis of the Sociological Aspects of Government Administration. (2-2) Yr. Mr. BENDIX



205A-205B. Seminar in Social Policy and Social Action. (2-2) Yr.

Mr. ANDERSON

Role of social science research and rational analysis in formulation and implementation of social policy; processes of collective decision-making and social planning; case materials.

210A-\*210B. Seminar in the History of Sociological Theory (2-2) Yr.

Mr. BOCK

Studies in the contributions of selected sociologists, with special reference to the relations between their empirical research and theoretical findings.

\*215A-215B. Interdepartmental Seminar. (2-2) Yr. The STAFF and others

221A-221B. Seminar in Social and Historical Processes. (2-2) Yr.

Miss HODGEN

235A-235B. Seminar in the Impact of Nomadic Cultures on China. (3-3) Yr.

Mr. EBERHARD

Social, economic, and political relations between the nomadic cultures and the developed Chinese culture.

241A-241B. Seminar in Social Organization. (2-2) Yr.

Mr. NISBET

Studies in the relationships of social groups to modern political and economic institutions.

Seminar in Theories of History (Philosophy 247). (2) II.

250. Research Specialization by Arrangement with Related Departments.

(1-3) I and II.

299. Individual Study and Research. (3-6) I and II.

The STAFF (Mr. BENDIX in charge)

\* Not to be given, 1948-1949.

## SPANISH AND PORTUGUESE

ERASMO BUCETA, Doctor en Derecho, Professor of Spanish.

CHARLES E. KANY, Ph.D., Professor of Spanish.

JOSÉ F. MONTESINOS, Licenciado en Filosofía y Letras, Professor of Spanish.

LESLEY B. SIMPSON, Ph.D., Professor of Spanish (Chairman of the Department).

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.

ROBERT K. SPAULDING, Ph.D., Associate Professor of Spanish.

DOROTHY C. SHADI, Ph.D., Assistant Professor of Spanish.

FERNANDO A. ALEGRIA, Ph.D., Instructor in Spanish.

MARIO CAMARINHA DA SILVA, Licenciado em Letras, Instructor in Portuguese.

G. ARNOLD CHAPMAN, Ph.D., Instructor in Spanish.

MARIAN FREDINE, M.A., Associate in Spanish.

<sup>2</sup> MADRE MERRILL, M.A., Associate in Spanish.

CECILIA G. ROSS, M.A., Associate in Spanish.

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<sup>1</sup> WILLIAM J. ENTWISTLE, LL.D., Litt.D., Doctor em Letras, Visiting Professor of Spanish.

<sup>2</sup> JOSEPH E. GILLET, Ph.D., Visiting Professor of Spanish.

EDWIN J. WEBBER, M.A., Lecturer 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 83.

*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 A or B; otherwise include course 4); course 25A-25B or 25 (with a grade of A or B); 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.

\* Absent on leave, 1948-1949.

<sup>1</sup> In residence fall semester only, 1948-1949.

<sup>2</sup> In residence spring semester only, 1948-1949.

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 100A, 103, 104, 105, 109, 110, and 111. 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 100B, 105, 110, 111, or 112. 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.

NOTE.—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

NOTE.—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. Mr. WEBBER in charge  
Sections meet five hours weekly.  
Prerequisite: course 1 or two years of high school Spanish, or the equivalent.
  3. Intermediate Spanish (continuation of 2). (4) I and II. Mrs. ROSS in charge  
Sections meet five hours weekly.  
Prerequisite: course 2 or three years of high school Spanish, or the equivalent.
  4. Intermediate Spanish (continuation of 3). (4) I and II. Mrs. SHADI in charge  
Sections meet five hours weekly.  
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. MORBY, Mrs. SHADI, Mr. SIMPSON,  
Mr. SPAULDING, Mr. WEBBER  
Required as preparation for the major.  
Prerequisite: four years of high school Spanish, or course 3 (with a grade of A or 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

- 100A. Introduction to Spanish Linguistics. (2) I. Mr. KANY
- 100B. American-Spanish Divergencies from Standard Castilian. (2) II.  
 Course 100A is not prerequisite to 100B. Mr. KANY
- 103A-103B. Nineteenth-Century Peninsular Literature (1830-1900). (3-3) Yr.  
 Mr. SIMPSON, Mr. MONTESINOS
- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester.  
 Required of majors in Plan B. Mr. TORRES-RIOSECO, Mr. CHAPMAN
- 105A-105B. Modern Peninsular Drama: From the Romantic Movement to the Present. (2-2) Yr. Mrs. SHADI
- 107A-107B. History of Spanish Literature to 1830. (3-3) Yr.  
 Mr. BUCETA, Mr. MORBY, Mr. GILLET  
 Two sections. 107A. Mr. Buceta, Mr. Morby; 107B. Mr. Gillet.  
 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. ENTWISTLE, Mr. SIMPSON  
 111A. Mr. Entwistle; 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.  
 Required of majors in Plan B. Mr. TORRES-RIOSECO
- 114A-114B. The Contemporary Spanish-American Novel. (2-2) Yr.  
 Required of majors in Plan B. Mr. ALEGRIA
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. KANY  
 Required only of candidates for the Certificate of Completion, teacher-training curriculum.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
 Mr. SIMPSON in charge

\* Not to be given, 1948-1949.

## GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 156.  
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. Mr. ENTWISTLE
- 209A-209B. The Drama of the Golden Age. (2-2) Yr.  
An intensive study of one author. Mr. ENTWISTLE, Mr. GILLET
- 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
- \*216. Spanish Versification. (2) II. \_\_\_\_\_
225. Pronunciation. (2) I. Mr. KANY
299. Special Advanced Study. (1-4) I and II. Mr. SIMPSON 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. CAMARINHA DA SILVA in charge  
Sections meet five hours weekly.
2. Elementary Portuguese. (4) I and II. Mr. CAMARINHA DA SILVA in charge  
Sections meet five hours weekly.  
Prerequisite: course 1 or oral command of the language.
25. Advanced Portuguese. (3) I. Mr. CAMARINHA DA SILVA  
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. CAMARINHA DA SILVA  
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, 109, 201, and 299.

\* Not to be given, 1948-1949.

- \*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. CAMARINHA DA SILVA  
Survey of the literature of Brazil, with emphasis on the nineteenth and  
twentieth centuries.
131. Advanced Portuguese Composition and Conversation. (3) II.  
Mr. CAMARINHA DA SILVA
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Mr. CAMARINHA DA SILVA

## GRADUATE COURSES

201. The Brazilian Novel. (2) II. Mr. CAMARINHA DA SILVA
- \*299. Special Advanced Study. (1-4) I and II. Mr. MALKIEL in charge

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\* Not to be given, 1948-1949.

## SPEECH

GERALD E. MARSH, M.A., Professor of Speech (Chairman of the Department).

C. DOUGLAS CHRÉTIEN, 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.

ALAN R. THOMPSON, Ph.D., Associate Professor of Speech and Dramatic Literature.

DWIGHT E. WATKINS, M.A., Associate Professor of Speech, Emeritus.

†EDWARD N. BARNHART, Ph.D., Assistant Professor of Speech and Lecturer in Psychology.

WILLIAM B. MCCOARD, Ph.D., Assistant Professor of Speech.

AURORA M. QUIROS, M.A., Assistant Professor of Speech.

GARFF B. WILSON, Ph.D., Assistant Professor of Speech.

WILLIAM B. HOLTHER, Ph.D., Instructor in Speech.

JOSEPH TUSSMAN, Ph.D., Instructor in Speech.

ROBERT L. BELOOF, M.A., Lecturer in Speech.

MARGARET G. BLACKBURN, M.A., Lecturer in Speech.

WILLIAM FEARNSIDE, Ph.D., Lecturer in Speech.

MARGUERITE H. FOSTER, Ph.D., Lecturer in Speech.

REBECCA HAYDEN, M.A., Lecturer in Speech.

ISABEL HUNGERLAND, Ph.D., Lecturer in Speech.

SINCLAIR KERBY-MILLER, 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.

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,

† Sabbatical leave in residence, fall semester, 1948-1949.

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 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 83.

*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. BARNHART, Mr. CHRÉTIEU, 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. R. 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.

NOTE.—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. BELOOF, Miss BLACKBURN, Mrs. FOSTER, Miss HAYDEN,  
Mrs. HUNGERLAND, Mr. MCCOARD, Miss QUIROS, 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 study of evidence of proof with emphasis on the application of logic to rational discussion of social problems.



12. Psychology of Argument. (3) I. Mr. BARNHART  
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. Miss HAYDEN  
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.  
Prerequisite: course 26 or consent of the instructor.

## 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.  
Mr. PERSTEIN, Mr. ROWELL, Mr. TUSSMAN, Mr. HOLTHEER  
Beginning each semester. Prerequisite: course 1A-1B.  
107A. I, three sections. II, one section. 107B. I, one section. II, three sections.
- 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, Mr. MCCOARD, Miss QUIROS, Mr. G. B. WILSON  
Prerequisite: course 2A-2B.  
(a) The essay and the short story. (b) The ballad, the lyric, the ode, etc.  
111A. I, three sections. II, two sections. 111B. I, one section. II, three sections.
- 117A-117B. Semantics. (3-3) Yr. Mr. RYNIN  
Introduction to the nature and functions of language with special emphasis on the problems of meaning.  
117A. The language of science; 117B. The language of values.

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\* Not to be given, 1948-1949.

118. Symbolism: A Study of the Expressive Functioning of Signs. (3) II.  
Mrs. HUNGERLAND  
The nature of symbols, with special emphasis on their function in poetry.  
Prerequisite: course 12 or consent of the instructor.
119. Analysis of Communication Content. (3) II. Mr. BARNHART  
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. HOLTHUR  
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, Gladstone, 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. 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.  
Mr. MARSH and the STAFF
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The STAFF (Mr. MARSH in charge)

\* Not to be given, 1948-1949.

**SUBJECT A: ENGLISH COMPOSITION**

R. BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.

EDWIN S. MORBY, Ph.D., Associate Professor of Spanish.

PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.

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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. I, twenty-eight sections as announced in the SCHEDULE OF EXERCISES. II, fifteen sections. 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. For the regulations governing this requirement, see page 37.

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.  
 WILLIAM H. BOYNTON, D.V.M., Professor of Veterinary Science.  
 GEORGE H. HART, M.D., D.V.M., Professor of Veterinary Science, 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.  
 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., Assisant Professor of Veterinary  
 Science.

UPPER DIVISION COURSES

101. Poultry Hygiene. (3) II. Mr. BEACH, Mr. DEOME  
 Lecture and laboratory. Given each fourth semester.  
 Prerequisite: Bacteriology 1 (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 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

NOTE.—Research in poultry diseases may be elected in above courses.

\* 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. See also the Preveterinary Science curriculum in the College of Agriculture, page 92 of this bulletin.

## 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.

CURT STERN, Ph.D., Professor of Zoölogy.

C. M. YONGE, F.R.S., F.R.S.E., D.Sc. (Regius Professor of Zoölogy, University of Glasgow), Visiting Professor of Zoölogy, for the Spring Semester.

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 Experimental Biology.

SETH B. BENSON, Ph.D., Associate Professor of Zoölogy and Curator of Mammals, California Museum of Vertebrate Zoölogy.

RICHARD M. EAKIN, Ph.D., Associate Professor of Zoölogy.

J. E. GULLBERG, A.B., Associate Professor of Metrology.

WILLIAM E. BERG, Ph.D., Assistant Professor of Zoölogy.

MORGAN HARRIS, Ph.D., Assistant Professor of Zoölogy.

A. STARKER LEOPOLD, Ph.D., Assistant Professor of Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy.

FRANK A. PITELKA, Ph.D., Assistant Professor of Zoölogy and Assistant Curator of Birds, California Museum of Vertebrate Zoölogy.

RALPH I. SMITH, Ph.D., Assistant Professor of Zoölogy.

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.

OLIVER P. PEARSON, Ph.D., Instructor in Zoölogy and Assistant Curator of Mammals, California Museum of Vertebrate Zoölogy.

DONALD P. ABBOTT, M.A., Associate in Zoölogy, for the fall semester.

RICHARD E. PAULSON, A.B., Associate in Zoölogy.

ROBERT SAMUELS, M.A., Associate in Zoölogy, for the spring semester.

ELIZABETH SCOTT, M.A., Associate in Parasitology, for the fall semester.

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FRANCES M. WEESNER, A.B., Lecturer in Microscopic Technique.

*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 83.

*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. PAULSON, Mr. SAMUELS  
 I: Mr. Harris, Mr. Paulson; II: Mr. Paulson, 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. Laboratory study of cells, tissues, and organ systems of the frog, of representatives of the major invertebrate groups, and of genetics.
- 1B. General Zoölogy. (4) II. Mr. BERN, Mr. SALT  
 Lectures and laboratory.  
 Prerequisite: course 1A.  
 Anatomy, histology, development, function, and history of the vertebrate body. Laboratory study of amphioxus, ammocoetes, the shark, the amphibian embryo and larva, and the rat.
4. Microscopic Technique. (2) I and II. Miss WEESNER  
 Laboratory.  
 Prerequisite: course 1A and elementary chemistry.
10. General Biology. (3) I and II. Mr. BERG, Mr. BERN, Mr. SMITH  
 I: Mr. Berg, Mr. Bern; II: Mr. Smith.  
 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, Mr. ABBOTT  
 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).

\* Not to be given, 1948-1949.

- \*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. (123 and 103 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.  
 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. DAVIS  
 Lectures and laboratory.  
 Prerequisite: course 1B; recommended, course 100.  
 Evolution of organ systems and phylogeny of the major vertebrate groups.
107. Cytology. (2) II. Mr. GOLDSCHMIDT  
 Prerequisite: elementary zoölogy or botany.  
 The structure and activities of the cell, especially in development, in sex determination, and in heredity.
- 107c. Cytology Laboratory. (2) II. Mr. GOLDSCHMIDT  
 Prerequisite: course 107 (may be taken concurrently).
109. Biological Examination of Water. (1) II. Mr. KIRBY  
 Microörganisms, other than bacteria, in relation to water supplies.  
 Restricted to students in sanitary engineering.
110. Biology of the Protozoa. (4) II. Mr. KIRBY  
 Lectures and laboratory.  
 Prerequisite: course 1A and upper division standing; recommended, course 119A.  
 Consideration of the groups of protozoa and of the contributions made through study of them to problems of biology.

\* Not to be given, 1948-1949.

- \*111. General Parasitology. (4) Mr. KIRBY  
 Prerequisite: course 1A and upper division standing.  
 Lectures and laboratory.  
 Study of the characteristics, life history, and host relationships of animal parasites other than protozoa and higher arthropods, with emphasis on helminthology.
112. Invertebrate Zoölogy. (4) II. Mr. YONGE, 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. STEBBINS  
 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 Conservation. (3) II. Mr. LEOPOLD  
 Prerequisite: course 1A or 10 and upper division standing.  
 Wildlife conservation in the United States; theory and principles of game management; identification of economically important species.
- \*117. History of Biology. (2) II. \_\_\_\_\_
- 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.

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\* Not to be given, 1948-1949.



- 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 comparative and experimental embryology of marine invertebrates.
124. Experimental Invertebrate Zoölogy. (4) I. Mr. SMITH  
Lectures and laboratory.  
Prerequisite: course 1A and 112, or consent of the instructor.  
A study of the major invertebrate groups from a functional point of view, with individual laboratory problems on nutrition, respiration, excretion, coordination, and other functions.
125. General Ecology. (4) II. Mr. PITELKA  
Lectures, laboratory, and field work.  
Prerequisite: two semesters of upper division work in biology, and one of the following: courses 112, 113, Entomology 112 or Botany 108.  
Interrelations of organisms and their environment, study of communities, succession, effects of physical gradients, food chains, and population dynamics; analyses involving invertebrates, vertebrates, and plants.
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.

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\* Not to be given, 1948-1949.

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 function in amphibians and reptiles.
140. Internal Animal Parasites of Man. (4) I. Mr. KIRBY, Mrs. SCOTT  
Lecture and laboratory.  
Prerequisite: course 1A, or equivalent basic work, and consent of the instructor. Recommended: course 119A.  
Materials, laboratory methods, and use of literature in the study of protozoan and helminth parasites of man.
145. Wildlife Management. (3) II. Mr. LEOPOLD  
Prerequisite: course 116.  
Applied aspects of wildlife management.
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.

208. Seminar in Invertebrate Zoölogy. (2) II. Mr. YONGE  
Prerequisite: graduate standing and a course in invertebrate zoölogy.
212. Advanced Marine Invertebrate Zoölogy. (4) Mr. YONGE, Mr. SMITH  
Given at the seashore in the first Summer Session.
- \*214. Seminar in Heredity and Evolution. (2) II. 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.  
Seminar on problems of speciation and isolating mechanisms in vertebrates.

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\* Not to be given, 1948-1949.

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. KIRBY in charge)  
Meetings for the presentation of original work by the faculty, guest investigators, and graduate students.
241. Seminar in Protozoölogy and Parasitology. (2) II. Mr. KIRBY  
Prerequisite: course 110 and a course in parasitology.
242. Seminar on the Genetics of Sex Determination. (2) I. Mr. GOLDSCHMIDT  
Prerequisite: graduate standing and one course in genetics.
243. Vertebrate Review. (1) II. Mr. BENSON, Mr. PITELKA  
Review of current literature.
244. Genetics Review. (1) II. Mr. GOLDSCHMIDT  
Prerequisite: graduate standing and one course in genetics.  
Review of current literature and of special topics.
299. Special Study for Graduate Students. (1-4) I and II. The STAFF (Mr. KIRBY in charge)  
Prerequisite: graduate status in zoölogy and approval 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 31, 1948) by a total of 262,958 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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UNIVERSITY OF CALIFORNIA  
SUPPLEMENTARY ANNOUNCEMENTS

*to the General Catalogue, Departments at Berkeley*

New Courses; Changes in Courses; New Appointments;  
Changes in Appointments

February, 1949



NOTE.—Changes in the time schedule are not included in this circular. Consult the  
SCHEDULE AND DIRECTORY and departmental bulletin boards.  
The number in parentheses represents the unit value of the course.

**AGRICULTURE**

**Agricultural Economics**

- 101A. To be given by Mr. ERDMAN. (Not open to students who have completed  
Business Administration 123.)  
104. To be given by Mr. FULLER.  
107. Not to be given.

**Entomology and Parasitology**

127. Mr. LINSLEY added to staff of instruction.

**Food Technology**

- 127A-127B. This course may be repeated for credit.  
127B. Mr. JOSLYN in charge instead of Mr. MARSH.  
199, 237B. Mr. MRAK in charge instead of Mr. CRUESS.

**Genetics**

- 200B. Mr. DE OME added to the staff of instruction.

**Plant Pathology**

121. Mr. TAKAHASHI to assist Mr. RAWLINS.  
199. Mr. TAKAHASHI added to the staff of instruction.

**Poultry Husbandry**

- 200B. Mr. BOUTHILET added to the staff of instruction.

## ANTHROPOLOGY

### *New Course:*

235. Problems in the Culture History of South America. (2) II. Mr. ROWE  
Prerequisite: course 206.

160, 195. Not to be given.

## ARCHITECTURE

6A. Mr. CZAJA and Mr. GOODMAN added to the staff of instruction.

14. Mr. SCHNIER added to the staff of instruction.

101A. Mr. SIMONDS added to the staff of instruction.

114. To be given by Mr. SCHNIER instead of Mr. O'HANLON.

201A. Not to be given.

201B. Mr. MENDELSON to assist Mr. PERRY.

## ART

### *Absent on Leave, Spring Semester, 1949:*

STEPHEN C. PEPPER, Ph.D., Professor of Philosophy and Aesthetics (Chairman of the Department of Art).

### *Additional Appointment:*

GLENN WESSELS, M.A., Associate Professor of Art (Acting Chairman of the Department, spring semester, 1949).

### *New Courses:*

181. Practice in the Graphic Arts. (2) I and II. Mr. WESSELS

Prerequisite: consent of the instructor to enroll.

This course is included in the Letters and Science List of Courses.

201. Advanced Study and Practice in a Selected Technique. (4) I and II.

102, 269A. Not to be given.

Mr. HALEY

107. To be given by Mr. RYDER.

269B. Mr. LORAN in charge.

## ASTRONOMY

### *New Appointment:*

OLIVER J. LEE, Ph.D., Lecturer in Astronomy.

7B. Miss PILLANS to assist Mr. CUNNINGHAM.

11. Not to be given.

## BACTERIOLOGY

### *New Appointment:*

SHIRLEY GUNTER, M.S., Associate in Bacteriology.

### *New Courses:*

202. Seminar in General Bacteriology. (1) I and II. The Staff

Mr. FONC in charge

Prerequisite: course 199 or consent of the instructor to enroll.

Subjects will vary from year to year and will be announced at the beginning of each semester.

203. Seminar on Microbiological Metabolism. (1) I and II.

Mr. DOUDOROFF, Mr. STANIER

Prerequisite: course 202 or consent of the instructor to enroll.

204. Seminar in Medical Microbiology. (1) I and II. Mr. ELBERG, Mr. FONG

Prerequisite: course 202 or consent of the instructor to enroll.

205. Seminar in Immunology. (1) I and II. Mr. ELBERG

Prerequisite: course 204 and consent of the instructor to enroll.

206. Seminar in Experimental Pathology. (1) I and II. Mr. KRUEGER

Prerequisite: course 204 and consent of the instructor to enroll.

1, 2. Miss GUNTER added to the staff of instruction.

2, 4, 31, 102. Miss SCHULTZ added to the staff of instruction.

### BOTANY

201b. Mr. FOSTER in charge instead of Mr. MASON.

### BUSINESS ADMINISTRATION

#### *New Appointments:*

HAROLD LINAMEN, M. A., Associate in Accounting.

RONALD W. HAUGHTON, M.A., Lecturer in Industrial Relations.

FREDERICK W. KIMBALL, M.B.A., Lecturer in Business Administration.

#### *Died January 7, 1949:*

ALBERT H. MOWBRAY, A.B., Fellow of the Actuarial Society of America, Professor of Insurance.

#### *New Course:*

256. Administration of Wage Contracts and Dispute Settlement. (3) II.

Prerequisite: courses 151 and 154. Mr. HAUGHTON

Advanced studies in the professional aspects of collective bargaining; negotiation of the union contract; administration of the contract, dispute settlement.

108. Mr. FISHMAN and Mr. MOORE added to the staff of instruction.

121. To be given by Mr. KIMBALL.

163. To be given by Mr. VANCE.

166. To be given by Mr. STAEHLING.

261A. Not to be given.

### CHEMISTRY

#### *New Appointments:*

JOHN T. NEU, B.S., Instructor in Chemistry.

CARL D. THURMOND, B.S., Instructor in Chemistry.

#### *Absent on Leave, Spring Semester, 1948-1949:*

KENNETH S. PITZER, Ph.D., Professor of Chemistry.

*New Course:*

125. Instrumental Methods. (3) I and II. Mr. GUFFY, Mr. ORLEMANN

Prerequisite: courses 105 or 120, and 111.

Theory and application of instrumental methods in such fields as spectroscopy, polarography, and radioactivity to chemical problems.

This course is included in the Letters and Science List of Courses.

*Change in Course:*

149H. No longer an honors course. Number of course changed to 149. This course is not included in the Letters and Science List of Courses.

1A, 1B. Mr. NEU and Mr. THURMOND added to the staff of instruction.

110A. To be given by Mr. ZIMM instead of Mr. ROLLEFSON.

110B. To be given by Mr. ROLLEFSON instead of Mr. GWINN.

120. Mr. TEMPLETON to assist Mr. POWELL.

145B. Mr. WILKE added to the staff of instruction.

207A. Not to be given.

217. To be given by Mr. GWINN instead of Mr. PITZER.

223. Mr. PERLMAN to assist Mr. SEABORG.

### CITY AND REGIONAL PLANNING

*New Course:*

212. City Planning Problems. (4) II. Mr. T. J. KENT, JR.

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 cities and 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.

201B. Not to be given.

### CLASSICS

193. Not to be given.

### DECORATIVE ART

*Change in Appointment:*

WILLARD V. ROSENQUIST, M.A., Assistant Professor of Decorative Art (from January 1, 1949).

*New Appointment:*

IRMGARD W. JOHNSON, A.B., Lecturer in Decorative Art.

60B. Not to be given.

176A. To be given by Mrs. JOHNSON.

### ECONOMICS

*New Appointment:*

MARY J. BOWMAN, Ph.D., Lecturer in Economics.

*Additional Appointment:*

WALTER FRIEDLANDER, Ph.D., Lecturer in Economics.

*Absent on Leave, Spring Semester, 1948-1949:*

EMILY H. HUNTINGTON, Ph.D., Professor of Economics.

10. To be given by Mr. MOSK instead of Mr. BREAK.

100A. Miss BOWMAN and Mr. VUKASIN added to the staff of instruction.

100B. Mr. BREAK and Mr. VUKASIN added to the staff of instruction.

103. Mr. FELLNER added to the staff of instruction.

110, 241. Not to be given.

185. To be given by Mr. FRIEDLANDER instead of Miss HUNTINGTON.

200A. To be given by Mr. BAIN.

230. To be given by Mr. ROLPH.

## EDUCATION

*New Appointment:*

MERLE H. ELLIOTT, Ph.D., Lecturer in Education.

*Change in Appointment:*

THEODORE L. RELLER, Ph.D., Professor of Education.

114. To be given by Mr. ELLIOTT instead of Mr. TYLER.

116, 117, 163. Not to be given.

118. To be given by Mr. GILBERT.

164. To be given by Mr. BRAYFIELD.

206B. To be given by Mr. LILGE.

## ENGINEERING

*New Appointments:*

HENRY A. SCHADE, Dr.Eng., Professor of Mechanical Engineering and Director of Engineering Research.

DIMITRI P. KRYNINE, C.E., Visiting Professor of Civil Engineering.

EDWARD C. KEACHIE, Ph.D., Associate Professor of Mechanical Engineering.

FRED N. FINN, B.S., Lecturer in Civil Engineering.

ALBERT L. HALE, B.S., Lecturer in Engineering Design.

JACK K. K. HUM, B.S., Lecturer in Metallurgy.

RALPH S. MACKEY, A.B., Lecturer in Electrical Engineering.

NATHAN C. PRICE, B.S., Lecturer in Mechanical Engineering.

ROBERT W. ROTH, B.S., Lecturer in Mechanical Engineering.

CHARLES F. SCHEFFEY, B.S., Lecturer in Civil Engineering.

*Changes in Appointment:*

DON M. CUNNINGHAM, M.S., Assistant Professor of Engineering Design.

ROBERT V. DUNKLE, M.S., Assistant Professor of Mechanical Engineering.

WILBUR H. SOMERTON, M.S., Assistant Professor of Petroleum Engineering.

*Died January 9, 1949:*

RAYMOND C. MARTINELLI, Ph.D., Associate Professor of Mechanical Engineering.

18A. Mr. MEIXNER and Mr. SHERARD added to the staff of instruction.

- 21. Mr. PISTER and Mr. CLYDE added to the staff of instruction.
- 35. Mr. LAURENSEN in charge instead of Mr. MERIAM.
- 48. Not to be given.

### Civil Engineering

#### *New Course:*

- 171. Introduction to Traffic Engineering. (3) I and II. Mr. D. S. BERRY
- 102A. To be given by Mr. CLYDE and Mr. WOODWARD.
- 104. To be given by Mr. FOOTE.
- 106. To be given by Mr. JONES and Mr. MOYER.
- 107C. Mr. PISTER added to the staff of instruction.
- 107G. To be given by Mr. EBERHART.
- 108C. Mr. FINN, Mr. GREEN, and Mr. POLIVKA added to the staff of instruction.
- 108E. Mr. BRESLER, Mr. JONES, Mr. KLEIN, Mr. POLIVKA, and Mr. TROXELL added to the staff of instruction.
- 108F. Mr. MEIXNER added to the staff of instruction.
- 109A. To be given by Mr. MALONY.
- 110. Not to be given.
- 112. Mr. LIN added to the staff of instruction.
- 113. To be given by Mr. VALLERGA.
- 133. Mr. WOODWARD added to the staff of instruction.
- 135. To be given by Mr. R. E. DAVIS and Mr. LIN instead of Mr. TROXELL.
- 208. Mr. KRYNINE, Mr. WOODWARD, and Mr. VALLERGA added to the staff of instruction.
- 261. Mr. EINSTEIN added to the staff of instruction.

### Electrical Engineering

#### *Changes in Courses:*

- 111A-111B. Prerequisite: courses 104A-104B, 110A-110B, 106 (for 111A, only); Engineering 35, Engineering Design 102B. Course 111A is not prerequisite to 111B.
- 116A-116B. Prerequisite: course 106, Mathematics 110, and senior standing in electrical or mechanical engineering.
- 216A-216B. Prerequisite: courses 116A-116B, 117A-117B, and Mathematics 119A-119B.
- 218, 220B. Not to be given.

### Engineering Design

- 102B. Mr. GOLDSMITH in charge instead of Mr. MERIAM.
- 170. To be given by Mr. GARLAND.
- 298. Mr. SOROKA in charge instead of Mr. GARLAND.

### Mechanical Engineering

- 120, 143. Mr. KEACHIE added to the staff of instruction.
- 126. To be given by Mr. LAURENSEN.

- 128B. To be given by Mr. TICHWINSKY instead of Mr. LAURENSEN.  
 145. Mr. YANG added to the staff of instruction.  
 173. Mr. SCHAAF added to the staff of instruction.  
 198. Topic on Engineering Design for Process Engineers to be given by Mr. MAKER.  
 276. To be given by Mr. SCHAAF.  
 298. Seminar on Design and Development of Gas Turbines, to be given by Mr. PRICE.

### Mineral Technology

#### *New Courses:*

- Ceramic Engineering 100. The Ceramic Industry. (2) II. Mr. PASK  
 Prerequisite: junior standing in an engineering curriculum, 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.
199. Individual Studies or Research for Advanced Undergraduates. (1-5) I and II. Mr. PASK  
 Prerequisite: senior standing in an engineering curriculum, in the College of Chemistry, or in the College of Letters and Science with a major in geology, chemistry, or physics.
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.
- Petroleum Engineering 207B. To be given by Mr. PUTNAM instead of Mr. UREN.  
 Metallurgy 2B. To be given by Mr. HUM instead of Mr. MITCHELL.
106. To be given by Mr. DORN.  
 110A, 114. To be given by Mr. MITCHELL.  
 150B. Mr. POTTER added to the staff of instruction.  
 198, 199, 202, 298, 299A, 299B. Mr. MITCHELL in charge.

### Transportation Engineering

#### *New Courses:*

198. Directed Group Study 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 and Research for Advanced Undergraduates. (1-5)  
I and II. The Staff (Mr. H. E. DAVIS in charge)  
Prerequisite: senior standing in engineering.  
Research and individual study on selected topics in transportation engineering.
270. Airport Engineering. (3) II. Mr. HORONJEFF  
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 either semester.  
The Staff (Mr. H. E. DAVIS in charge)  
Research or investigation in selected advanced subjects in transportation engineering.  
299A to be given spring semester, 1949.

#### ENGLISH

##### *Change in Appointment:*

THOMAS F. PARKINSON, Ph.D., Instructor in English.

100. Mr. BOGARD added to the staff of instruction.

125D. To be given by Mr. RALEIGH instead of Mr. BRIGHTFIELD.

154. Not to be given.

210. To be given by Mr. MUSCATINE.

#### FORESTRY

128. To be given by Mr. ZIVNUSKA instead of Mr. ARNOLD.

#### FRENCH

##### *Additional Appointment:*

CLARENCE D. BRENNER, Ph.D., Associate Professor of French (Acting Chairman of the Department, spring semester, 1949).

##### *New Course:*

152. Comparative Literature and Art. (2) II.

Mr. WOLFF

Some literary and artistic exchanges between France, England, and America in the 19th century and early 20th century.

This course is included in the Letters and Science List of Courses.

9B. Mr. SACHS added to the staff of instruction.

25. Miss DE LA HARPE to be in charge instead of Mr. BISSELL.

## GEOGRAPHY

### *Additional Appointment:*

JOHN E. KESSELI, Ph.D., Associate Professor of Geography (Acting Chairman of the Department, spring semester, 1949).

### *New Appointment:*

WILLIAM J. TALBOT, B.Sc., Visiting Professor of Geography (Professor of Geography, University of Cape Town).

## GEOLOGY

108. To be given by Mr. VERHOOGEN.

## GERMAN

### *Sabbatical Leave in Residence, Spring Semester, 1949:*

HANS M. WOLFF, J.D., Ph.D., Associate Professor of German.

1c, Sec. 4. To be given by Mrs. LÖHNBERG.

203. Not to be given.

214. To be given by Mr. PRICE.

222. Not to be given.

229. To be given by Mr. WOLFF.

250. Mr. PRICE in charge instead of Mr. WOLFF.

## HISTORY

### *New Appointment:*

EVELYN B. McCUNE, A.B., Lecturer in History.

197B, 199. To be given by Mrs. McCUNE.

292B. Not to be given.

## JOURNALISM

### *New Appointment:*

PAUL FREDERICKSEN, B.L., Associate in Journalism.

20B. Mr. ROSENBERG added to the staff of instruction.

130B. Mr. FREDERICKSEN, Mr. MURRAY, Mr. ROSENBERG added to the staff of instruction.

171. Mr. ROSENBERG added to the staff of instruction.

## JURISPRUDENCE

### *New Appointment:*

MOSES HUBERMAN, A.B., LL.B., Lecturer in Law.

### *Additional Appointment:*

HANS KELSEN, Ph.D., Lecturer in Law.

### *New Course:*

265. Advanced Legal Writing. (2) II.

Mr. PROSSER

Prerequisite: permission of the instructor to enroll

Selected problems in legal writing.

234. To be given by Mr. WANVIC instead of Mr. FERRIER.

237. To be given by Mr. HUBERMAN instead of Mr. SURREY.

258. To be given by Mr. KELSEN.

284. To be given by Mr. SURREY.

## LIBRARIANSHIP

### *New Appointment:*

MARGARET D. URIDGE, A.B., Cert. in Libr., Lecturer in Librarianship.  
210. To be given by Mrs. URIDGE.

## MATHEMATICS

### *New Appointment:*

LAMBERTO CESARI, Ph.D., Visiting Professor of Mathematics.

### *Additional Appointment:*

CHARLES B. MORREY, JR., Ph.D., Professor of Mathematics (Acting Chairman of the Department, spring semester, 1949).

### *Change in Appointment:*

TING K. PAN, M.A., Lecturer in Mathematics.

4. Miss SPERRY to be in charge.

4B. Mr. LEWY in charge instead of Mr. BARANKIN.

4H. To be given by Mr. LEWY instead of Mr. MORREY.

8, 119B. Mr. NEUSTADTER added to the staff of instruction.

10. To be given by Mr. WILLIAMS.

12, Sec. 2. To be given by Mr. HUGHES M W F, 1, in Room 201, Durant Hall.

110B. Mr. JEEVES added to the staff of instruction.

111A. Mr. FOSTER and Mr. LEHMANN added to the staff of instruction.

111B. Mr. DILIBERTO and Mr. JAMES added to the staff of instruction.

112A. To be given by Mr. PAN.

118. To be given by Mr. DILIBERTO instead of Mr. LEWY.

119A. Mr. APOSTOL and Mrs. SMITH added to the staff of instruction.

201B. To be given by Mr. CESARI.

220B. Mr. PINNEY added to the staff of instruction.

260D. Mr. JEEVES added to the staff of instruction.

270. To be given by Mr. LEWY

280D. Miss SCOTT added to the staff of instruction.

290, 295. Mr. LEHMER to be in charge instead of Mr. EVANS.

290(c). Topics in analysis. To be given by Mr. WOLF.

290(b). Modern developments in measure theory and the theory of generalized integration. To be given by Mr. CESARI.

290P. To be given by Mr. LOÈVE.

## MILITARY SCIENCE AND TACTICS

### *New Appointments:*

JAMES D. STRONG, Lieutenant Colonel, Corps of Engineers; Associate Professor of Military Science and Tactics.

ALBERT C. WILLIAMS, Lieutenant Colonel; Associate Professor of Military Science and Tactics.

HOWARD G. FORD, Major, Corps of Military Police; Associate Professor of Military Science and Tactics.

WILLIAM R. MATTISON, Major, Signal Corps; Associate Professor of Military Science and Tactics.

WINIFRED L. HASTY, JR., Captain, Quartermaster Corps; Assistant Professor of Military Science and Tactics.

### MUSIC

*Change in Course:*

215A-215B. (Formerly numbered 215). The History of Dissonance Treatment.  
(3-3) Yr. Mr. BUKOFZER

75, 175. Mr. NIN-CULMELL added to the staff of instruction.

214. Not to be given.

### NAVAL SCIENCE

*New Appointment:*

LEE S. DOLSON, JR., Lieutenant, U.S.N.; Assistant Professor of Naval Science.

103M. To be given by Mr. MORRISEY.

### NURSING

*Absent on Leave, Spring Semester, 1949:*

MARGARET A. TRACY, R.N., M.S., Assistant Professor of Nursing (Chairman of the Department)

*Additional Appointment:*

PEARL CASTILE, R.N., M.A., Assistant Professor of Nursing (Acting Chairman of the Department, spring semester, 1949).

### ORIENTAL LANGUAGES

*New Appointment:*

ERNEST R. HUGHES, M.A. (Oxon.), Lecturer in Oriental Languages.

*New Course:*

178. Language, Thought, and Logic in Early China. (2) II. Mr. HUGHES  
Prerequisite: junior standing.

13. To be given by Mr. MILLER.

### PALEONTOLOGY

199, 208. Mr. CAMP in charge instead of Mr. DURHAM.

207. Not to be given.

### PHILOSOPHY

*New Appointment:*

GEORGE BOAS, Ph.D., Visiting Professor of Philosophy (Professor of Philosophy, Johns Hopkins University).

*New Courses:*

140. French Philosophy from Descartes to Bergson. (3) II. Mr. BOAS  
Prerequisite: course 10A-10B or its equivalent.

248. Seminar on the Problems in Historiography of Philosophy. (2) II.

Prerequisite: graduate standing.

Mr. BOAS

114. Not to be given.

136c. To be given by Mr. BOAS.

### PHYSICAL EDUCATION

165B. To be given by Miss ESPENSCHADE.

### PHYSICS

4A. Mr. CHAMBERLAIN added to the staff of instruction.

41A. Mr. FRETTER added to the staff of instruction.

110B. To be given by Mr. THORNTON instead of Mr. POWELL.

121. To be given by Mr. SEGRÈ instead of Mr. THORNTON.

127. To be given by Mr. GOFMAN instead of Mr. TOBIAS.

290. Mr. SEGRÈ added to the staff of instruction.

### POLITICAL SCIENCE

#### *New Appointments:*

M. EDWIN O'NEILL, M.A., Associate Professor of Criminalistics.

THOMAS A. BISSON, M.A., Lecturer in Political Science.

WALTER BROMBERG, M.D., Lecturer in Criminology.

FREDRYC R. DARBY, M.A., Lecturer in Political Science.

BOCUMIL VOSNJAK, Dr. rer. Pol., Lecturer in Political Science.

#### *Absent on Leave, Spring Semester, 1949:*

ERIC C. BELLQUIST, Ph.D., Associate Professor of Political Science.

#### *New Courses:*

130. Government and Politics of the Balkan States. (3) II. Mr. VOSNJAK

This course is included in the Letters and Science List of Courses.

145M. Government and Politics of Japan. (3) II. Mr. BISSON

Students may receive credit for both 145 and 145M.

This course is included in the Letters and Science List of Courses.

163. Traffic Control. (2) II. Mr. WILSON

Education and enforcement problems in the control of roadway traffic.

164. Physical Evidence. (2) II. Mr. O'NEILL

Prerequisite: 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.

165. Criminologic Psychiatry. (2) II. Mr. BROMBERG

Historical background of mental sciences in criminology; social and psychological significance. Legal and medical criteria of responsibility for criminal behavior. Personality disturbance as reflected in individual crimes, psychodynamics of criminal behavior. Psychotherapy among offenders, its rationale, aims and theory.

234. Seminar on Selected Problems in Balkan Governments and Politics. (2) II.

Mr. VOSNJAK

*Change in Course:*

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.

124. To be given by Mr. DARBY instead of Mr. RUSSELL.

129, 145, 152, 248B. Not to be given.

130. To be given M W F, 3, in Room 100, Building T-1, by Mr. VOSNJAK.

168B. To be given by Mr. O'NEILL instead of Mr. WILSON.

175. To be given by Mr. BISSON instead of Mr. BELLQUIST.

231B. To be given by Mr. BISSON instead of Mr. RUSSELL.

234. To be given Th, 2-4, in Room 120, Building T-1, by Mr. VOSNJAK.

238B. To be given by Mr. MAH.

### PSYCHOLOGY

*New Appointment:*

FRANK K. SHUTTLEWORTH, Ph.D., Lecturer in Psychology.

*Absent on Leave, Spring Semester, 1949:*

HAROLD E. JONES, Ph.D., Professor of Psychology.

1B. To be given by Mr. IMMERGLUCK.

132, 285E. Not to be given.

265F. Mr. SANFORD added to the staff of instruction.

### PUBLIC HEALTH

*New Appointments:*

DONALD D. REID, M.B., Ch.B., M.D., Ph.D., Visiting Associate Professor of Biostatistics.

EDWIN R. WEINERMAN, M.D., M.P.H., Visiting Associate Professor of Medical Economics.

MARY E. BARDUHN, M.S., Lecturer in Public Health Nutrition.

WILLIAM A. LONGSHORE, JR., B.A., M.D., M.P.H., Lecturer in Public Health.

*Change in Appointment:*

MARION W. SHEAHAN, B.S., Visiting Associate Professor in Public Health Administration (from January 1, 1949).

16. Mr. TAYLOR to be in charge instead of Mr. YERUSHALMY.

49. Not to be given.

109. To be given by Mr. WEINERMAN and Mr. NORWICK.

125. To be given by Miss BIERMAN instead of Mr. COHEN.

134. Not to be given.

147A. Not to be given.

147B. Mr. LONGSHORE added to the staff of instruction instead of Mr. STILES.

- 160B. To be given by Mr. BENNETT instead of Mr. TAYLOR.  
161B. Mrs. FRENCH added to staff of instruction.  
164. Mr. BENNETT to be in charge instead of Mr. YERUSHALMY.  
169. Not to be given.  
170. Mr. HINE and Mr. TEBBENS added to the staff of instruction.  
171. To be given by Mr. TEBBENS instead of Mr. GOTAAS.  
172. Mr. TEBBENS added to the staff of instruction.  
189. To be given by Mrs. BARDUHN.  
206B. Mr. WEINERMAN to be in charge.  
224. To be given by Miss SHEAHAN.  
233. Not to be given.  
246. Mr. REID added to the staff of instruction.  
249B. Not to be given.  
262. Not to be given.  
264. To be given by Mr. REID instead of Mr. YERUSHALMY.  
265, 268, 269B. Not to be given.

#### SLAVIC LANGUAGES

- 18B. To be given by Mr. GRIGORIEFF.  
102B. To be given by Mr. WHITFIELD and Mrs. MALOZEMOFF.  
103B. Mrs. MALOZEMOFF added to the staff of instruction.  
105, 200. Not to be given.  
119B. To be given by Mr. GRIGORIEFF instead of Mrs. PATRICK.  
123. To be given by Mr. WHITFIELD instead of Mr. GUINS.  
132, 136, 188. Not to be given.  
135. To be given by Mrs. PATRICK.  
224B. To be given by Mr. WHITFIELD instead of Mr. MASLENIKOV.  
225. To be given by Mr. MASLENIKOV.

#### SOCIAL WELFARE

##### *Additional Appointment:*

- ALEXANDER SIMON, M.D., Lecturer in Social Welfare.  
202A. Mrs. CHILDS added to the staff of instruction.  
202B. Mrs. DEVERILL added to the staff of instruction.  
253A. To be given by Mrs. FREDERICKSEN.  
262. Mr. SIMON and Mr. REIDER added to the staff of instruction.  
282, 283. Not to be given.

#### SPANISH AND PORTUGUESE

- 25B. Mr. CHAPMAN added to the staff of instruction.  
103B. Mr. MORBY added to the staff of instruction.

#### SPEECH

##### *Resigned:*

- MARGUERITE H. FOSTER, Ph.D., Lecturer in Speech.  
2A-2B. Mr. HAGOPIAN and Mrs. RUSSELL added to the staff of instruction.

40. To be given by Mrs. RUSSELL instead of Miss HAYDEN.  
107B. Mr. BORAH added to the staff of instruction.  
138. Not to be given.

### VETERINARY SCIENCE

*Absent on Leave, Spring Semester, 1949:*

RAYMOND A. BANKOWSKI, D.V.M., Ph.D., Assistant Professor of Veterinary Science.

### ZOÖLOGY

*New Appointments:*

PAUL R. NEEDHAM, Ph.D., Professor of Zoölogy.

GEORGE W. SALT, M.A., Associate in Zoölogy.

ERIK ZEUTHEN, Ph.D., Lecturer in Zoölogy.

*New Course:*

138. Ichthyology. (4) II.

Mr. NEEDHAM

Lecture and laboratory.

Prerequisite: course 1B.

A study of the fundamental principles of Fishery biology, including classification and distribution of freshwater fishes, their habits, structures, and economic importance. Laboratory exercises in determining species, growth rates, age analyses, and adjustments to varying environmental conditions.

This course is included in the Letters and Science List of Courses.

101, 101c. To be given by Mr. ZEUTHEN.

241. Not to be given.

244. To be given by Mr. STERN instead of Mr. GOLDSCHMIDT.



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